

Southwest Florida *Water Management District*



July 2000



District **Water Management** Plan



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ABBREVIATIONS

ACSC	Area of Critical State Concern
AOR	Area of Responsibility
BEBR	Bureau of Economic and Business Research
BMPs	Best Management Practices
BPMs	Budgetary Performance Measures
CCMP	Comprehensive Conservation and Management Plan
COE	Corps of Engineers
CTC	Cooperating Technical Community
CWM	Comprehensive Watershed Management
DACS	Department of Agriculture and Consumer Services
DAIs	District Accountability Indicators
DCA	Department of Community Affairs
DEP	Department of Environmental Protection
DFA	Diagnostic Feasibility Assessment
District	Southwest Florida Water Management District
DOH	Department of Health
DOT	Department of Transportation
EMA	Ecosystems Management Area
EMAP	Environmental Monitoring and Assessment Program
EOG	Executive Office of the Governor
EPA	Environmental Protection Agency (of Hillsborough County)
EPC	Environmental Protection Commission
ERP	Environmental Resource Permit
ETB WUCA	Eastern Tampa Bay Water Use Caution Area
F.A.C.	Florida Administrative Code
FEMA	Federal Emergency Management Agency
FIRM	Federal Insurance Rate Maps
FLUCCS	Florida Land Use, Cover Classification System
FPCI	Flood Protection Coordination Initiative
F.S.	Florida Statutes
FWCC	Fish and Wildlife Conservation Commission
FWP	Florida Water Plan
FY	Fiscal Year
GAC	Governmental Affairs Coordinator
GIS	Geographical Information System

ABBREVIATIONS (continued)

gpd	gallons per day
GWBRAI	Ground Water Basin Resource Availability Inventory
HB	House Bill
IFAS	Institute of Food and Agriculture Sciences
IWRM	Integrated Water Resource Monitoring
mgd	million gallons per day
MFLs	Minimum Flows and Levels
MIA	Most Impacted Area (of the ETB WUCA)
NEP	National Estuary Program
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
NWFWMD	Northwest Florida Water Management District
NWSI	New Water Sources Initiative
PLRG	Pollutant Load Reduction Goal
ppsm	persons per square mile
PR/MRWSA	Peace River/Manasota Regional Water Supply Authority
OFW	Outstanding Florida Waters
P2000	Preservation 2000
Plan	District Water Management Plan
QWIP	Quality of Water Improvement Program
RAMP	Regional Ambient Monitoring Program
ROMP	Regional Observation Monitoring Program
RPC	Regional Planning Council
RWSP	Regional Water Supply Plan
SCADA	Supervisory Control and Data Acquisition
SFWMD	South Florida Water Management District
SGWB	Southern Ground Water Basin
SJRWMD	St. Johns River Water Management District
SOR	Save Our Rivers
SRWMD	Suwannee River Water Management District
STORET	Storage and Retrieval of U.S. waterways parametric data
SWAMP	Surface Water Ambient Monitoring Program
SWAP	Source Water Assessment Program
SFWWMD	Southwest Florida Water Management District
SWIM	Surface Water Improvement and Management Program
SWUCA	Southern Water Use Caution Area
TBC	Tampa Bypass Canal

ABBREVIATIONS (continued)

TBEP	Tampa Bay Estuary Program
TMDL	Total Maximum Daily Loads
TMZs	Timber Management Zones
UF	University of Florida
USGS	United States Geological Survey
WCP	Well Construction Permit
WHPA	Wellhead Protection Area
WHP	Wellhead Protection
WMA	Wildlife Management Area
WMD	Water Management District
WMLTF	Water Management Lands Trust Fund
WQMP	Water Quality Monitoring Program
WRAP	Water Resource Assessment Project
WRPC	Withlacoochee Regional Planning Council
WRWSA	Withlacoochee Regional Water Supply Authority
WSA	Water Supply Authority
WUCA	Water Use Caution Area
WUP	Water Use Permitting

Executive Summary

The July 2000 District Water Management Plan (the Plan) represents the first five-year update of the Southwest Florida Water Management District's "comprehensive plan." This twenty-year Plan is consistent with the requirements of Section 373.036, Florida Statutes (F.S.) and Section 62-40.510, Florida Administrative Code (F.A.C.), as well as the standard format devised by the five water management districts, the Florida Department of Environmental Protection (DEP) and the Executive Office of the Governor (EOG).

The primary purpose of the Plan is to serve as a comprehensive guide to the District in carrying out its water resource management responsibilities, including those for Water Supply, Flood Protection, Water Quality and Natural Systems. Just as importantly, its preparation and updating represents a significant interactive process with the District's Governing and Basin boards, standing advisory committees, various interest groups and the public.

The various sections that make up the Plan are briefly described below while the reader is referred to the full document for a more complete understanding of the content.

Chapter I: District Overview. This section provides a background understanding of the District in order to create perspective on water management needs within specific regions. This includes the District's history, cultural and natural resources, water use and publicly owned lands. It culminates with an assessment of the major accomplishments and changes since the original Plan was completed in 1994.

Chapter II: Water Management Goals and Policies. This section offers the District's vision, mission and goals that establish the long-term ends toward which programs and activities are directed. It also includes the core performance measures developed by the districts, DEP and the EOG, an important addition to the updated version of the Plan.

Chapter III: Water Management Responsibilities. This section provides a resource assessment (including comprehensive program descriptions), and the identification of issues, policies and strategies for each of the District's areas of responsibility (Water Supply, Flood Protection, Water Quality, Natural Systems and Management Services). A set of issues common to all our responsibilities, and how they will be addressed, is also included. The common issues, and "main messages" of each responsibility are as follows:

Part A. Issues Common to All Areas of Responsibility include:

1. Comprehensive Watershed Management Initiative (CWM)

The Comprehensive Watershed Management Initiative has been established in an effort to improve the management of water and related natural resources within the Southwest Florida Water Management District (SWFWMD or District). Started in 1994, the CWM Initiative employs a watershed-based approach to water and related natural resource management. Staff from a variety of disciplines and departments make up "watershed teams" that have been assigned to eleven primary watersheds within SWFWMD. Local governments and other stakeholders within each watershed are also significant partners on a number of these teams. The goals for the teams include:

- a. Collect, integrate and analyze the existing wealth of information pertinent to each watershed and create a data base for analytical purposes;
- b. Identify and prioritize existing and future water resource management issues relating to water supply, flood protection, water quality and natural systems (District Areas of Responsibility);
- c. Develop preventative or remedial actions to address these resource management issues;
- d. Implement and monitor the effectiveness of selected actions and the overall process and recommend potential revisions.

The CWM Initiative helps to ensure that comprehensive, coordinated analysis and decision-making take place. It fosters closer cooperation among the District, local governments and other stakeholders to help preserve the qualities of watersheds as growth and development take place in the future.

2. Linking Water Management and Land Use Planning

The water management activities of the District and the land-use planning and management activities of local governments must be coordinated in order for either to be effective and efficient in accomplishing their respective objectives. The land-use decisions of local governments, can have a variety of water management ramifications. Similarly, the water management efforts of the District, can have implications for local government land-use planning. Since local governments have exclusive authority over land-use decisions, it is important that their planning and actions be closely tied to the carrying capacity of natural resources such as water, and the agencies that manage them.

3. Collection, Coordination and Distribution of Technical Information

The District is constantly attempting to improve its understanding of the hydrologic system and human influences upon this system. This is particularly true for the groundwater system, which provides over 80 percent of the water supply in the District, and how it interacts with surface waters. However, the District does not have the luxury of waiting until it has all the desirable information and technical capabilities to make informed, rational resource management decisions. Rather, the District is required by statute to make current decisions based upon the best available information. Local governments and others rely on the District as a source of such information for their short- and long-range planning and implementation activities.

4. Compliance and Enforcement of Regulations

In order for the District's rules and regulations to effectively accomplish the objectives for which they were established, compliance with these rules and regulations must be ensured. The District must have a means by which to monitor compliance, and enforcement initiatives must be reviewed and updated as necessary.

5. Public Communication and Outreach

Water resources education is an essential part of each of the District's areas of responsibility. It is a goal of the District to provide all citizens, local governments, visitors, and organized interest groups within the 16-county area with information about its current activities and future plans, thereby increasing the public's awareness of their connection to, their dependence on, and their responsibility to participate in the protection of Florida's water resources.

Part B. Water Supply. A number of new legislative requirements and expectations have emerged to guide the District in ensuring an adequate supply of the water resource for all existing and future reasonable and beneficial uses. The District's efforts are characterized by sound planning and ongoing support for source development, with an emphasis on alternatives to traditional groundwater supplies which are reaching, or have exceeded sustainable limits throughout much of the District. This is being done in the Tampa Bay area through the innovative "Partnership Agreement", the key example to date of the District's strategy to create water resource management partnerships. A remaining challenge now being addressed is assuring water supplies and source protection in the Southern Water Use Caution Area (SWUCA).

Part C. Flood Protection. The focus is on retaining vigilance in the face of climatic variation and other uncertainties such as those associated with the 1997-98 El Niño pattern. A clear preference for non-structural solutions is being implemented through close coordination and clear role development with local governments, regional agencies such as 298 districts and others. Of particular importance is the linkage of land and water responsibilities through joint planning and investment that assures opportunities to prevent flood damage are seized.

Part D. Water Quality. The District's Comprehensive Watershed Management initiative is being applied to all our responsibilities, but is especially pertinent to management of water quality. It supports the twin strategies of prevention and restoration while emphasizing collaboration to achieve coordinated monitoring networks, implementation of Total Maximum Daily Loads (TMDLs), restoration of SWIM and other key waterbodies and addressing emerging issues such as nitrate contamination.

Part E. Natural Systems. Strategic land acquisition and management continues as a major tool to protect natural resources, including prudent use of less-than-fee simple techniques. The establishment of minimum flows and levels helps to define the limits of various water resources to meet growing water supply needs. The CWM initiative provides the ecosystem view necessary to manage complex systems. Restoration remains a requisite element in addressing such issues as the Flatford Swamp, degraded waterbodies and expanding human land uses. This area of responsibility is characterized by partnerships as well, including those for land acquisition and management, and substantial progress in SWIM waterbodies such as Tampa Bay and Lake Panasoffkee.

Part F. Management Services. The District's support functions are recognized as the foundation upon which successful resource management is built. Advancements in data management, communications and technology assure continuous improvement in service efficiency and effectiveness. Accountability is enhanced through performance measurement, planning and high quality budget reporting, including extensive work with the EOG.

Chapter IV: The Integrated Plan. The purpose of the Integrated Plan is to enhance the overall linkage of land and water management responsibilities through the creation of county-by-county water management plans. Each county plan will serve as a technical information resource that can be used to enhance local government comprehensive plans by linking local water resource planning to the best available data and other resources of the District. These stand alone documents will be developed following completion of the overall Plan, and will be made a part of the Plan by reference.

Chapter V: Watershed Management. This chapter brings together all the water resource-related elements in a place-based focus, integrating issues and strategies from the four major areas of responsibility on a watershed basis. This is being accomplished at the District through the CWM initiative, an ongoing effort for the eleven major watersheds in the District. As these CWM plans are completed they will become part of the overall Plan by reference.

Chapter VI: Implementation Coordination. Water management, particularly at the regional level, requires a close partnership between all levels of government (as well as both public and private entities) to assure that activities are conducted in a manner consistent with the long-term protection needs of Florida's water resources. This chapter covers current efforts that relate to implementation coordination and the District's strategy for enhancing such efforts.

Chapter VII: Procedures for Plan Development. This section documents the significant process used by the District in updating the Plan. The chapter provides sections on public and governmental organization participation, definitions for terms commonly used in water management and information on evaluation procedures for the Plan.

This Plan, though not self-implementing, serves as an important tool for the District. Actions by the Governing Board and the Basin boards, as well as staff activities, can now be viewed in terms of how they relate to an overall, comprehensive picture of water resource management. This will assist the District, and others, in assuring their actions are in the best interest of water and related natural resources.

Chapter I. District Overview

Introduction

The state of Florida has a unique relationship with water. As a peninsula, the state is nearly surrounded by the sea and has thousands of miles of coastline. Moreover, the quality of life in Florida is inseparably linked with its water resources. The majority of today's population and the trend of present growth patterns reflect coastal settlement, where fresh water is least abundant and natural systems such as estuaries and wetlands are most vulnerable. As a result, water management beyond 2000 involves the challenge of balancing sometimes competing priorities to provide adequate water supplies for human needs, appropriate flood protection, and sound management of water quality and natural systems. The State's five water management districts (WMDs) and the Florida Department of Environmental Protection (DEP) must meet this challenge and address the unique water resource issues of the various regions of the state. Federal, State, regional and local agencies responsible for land planning and development also have a significant role to play in protecting water-related resources. The District Water Management Plan (Plan) provides a comprehensive guide to the Southwest Florida Water Management District (SWFWMD or District) in carrying out its water resource management responsibilities: water supply, flood protection, water quality protection and restoration, and protection of natural systems.

The genesis of the Plan, and of this first five-year comprehensive update, is Chapter 373 of the Florida Statutes (F.S.). Specific intent for this planning is further delineated in the State Water Resource Implementation Rule (Chapter 62-40, Florida Administrative Code (F.A.C.)). The Plan serves a number of purposes:

1. To implement, further and accurately reflect the goals and policies of the State Comprehensive Plan.
2. To provide long-range guidance for decisions and actions of the WMDs through the establishment of regional water management goals and policies.
3. To form a key component of the Florida Water Plan.
4. To provide a regional basis and perspective for the coordination of governmental activities and the resolution of problems and issues relating to water management.
5. To provide a compendium of water resource information to form the basis for water management and provide for technical assistance to local governments, Regional Planning Councils and community interest groups.
6. To identify specific geographic areas where water resource problems or issues exist.
7. To identify specific strategies for addressing regional water resource problems and issues.
8. To strengthen accountability to the public through establishment of performance measures for District program activities.

In the formulation of this District Water Management Plan, the Governing Board has given due consideration to:

1. The attainment of maximum reasonable-beneficial use of water resources.
2. The maximum economic development of the water resources consistent with other uses.
3. The management of water resources for such purposes as environmental protection, drainage, flood control, and water storage.
4. The quantity of water available for application to a reasonable-beneficial use.

5. The prevention of wasteful, uneconomical, impractical, or unreasonable uses of water resources.
6. Presently exercised domestic use and permit rights.
7. The preservation and enhancement of the water quality of the state.
8. The state water resources policy as expressed by Chapter 373, F.S. (Section 373.036(2)(d)).

All five districts and the DEP have been working closely together to achieve consistency among their plans. The standard planning framework being used by all districts reflects consensus on our four resource-based areas of responsibility (water supply, flood protection, water quality management and natural systems management), and the planning steps to be applied to each. The SWFWMD has gone a step further, adding "management services" (or administrative activities) as a fifth area of responsibility. Its basic purpose is to assess our internal workings in order to assure efficient and effective achievement of our mission.

This Plan is the result of a significant, interactive process. It began with District staff, and has encompassed our Governing and Basin boards and standing advisory committees. These efforts were further supplemented by extensive input opportunities for citizens, local governments and utilities, regional planning councils, water supply authorities, state agencies and others. This is consistent with the manner in which the District has encouraged and incorporated affected parties throughout its existence. More detailed information on the planning process, and the degree of its inclusiveness, is contained in the Procedures for Plan Development section.

The balance of this District overview will address the history of the SWFWMD, its cultural and water resources (including water use patterns), and a brief description of District and other publicly owned lands and water

management programs. Finally, a summary of major accomplishments and changes by area of responsibility since the original Plan was accepted in 1994 is provided. These range from creating the Tampa Bay Partnership Agreement and establishment of Minimum Flows and Levels to strategic land acquisition and evolution of the Comprehensive Watershed Management initiative. The overall purpose of this section is to provide a background understanding of the District and perspective on the water management needs within geographic areas.

Part A. District History

Section 1. Origin and Evolution

The SWFWMD was created in 1961 by a special act of the Florida Legislature to be the local sponsor of the "Four River Basins, Florida Project." This was a major flood control project sponsored by the U.S. Army Corps of Engineers (COE) after Hurricane Donna caused massive damage to southwest Florida in 1960. The project included flood control structures and water detention areas, and encompassed a 6,000 square mile area. SWFWMD continues to cooperate with the COE today in maintaining and operating portions of this flood control system.

The District's responsibilities expanded in the mid- to late-1960s when regulatory programs for regional wellfields serving the Tampa Bay metropolitan area were initiated, and again in 1972 when the Florida Legislature passed the Water Resources Act. This Act significantly furthered the transition from strictly flood control to a more broad-based policy of resource management and service to the public. The Act was in response to a growing need for a more comprehensive approach to water management in the State, and received recognition as a model water statute from the National Water Commission for its regional approach and comprehensive scope.

The District's duties and responsibilities increased throughout the 1970s, 1980s and into the 1990s (see Figure 1). Some of these new duties were the result of legislative action, while others came about through delegation by state agencies. While the mission of the District has remained essentially the same – to manage and protect water and related natural resources – our areas of responsibility now encompass water supply, flood protection, water quality management and natural systems management. Moreover, there is growing recognition that the integration of all these areas is essential to effective planning and management of the resource.

Section 2. Area

The SWFWMD encompasses all or part of sixteen counties on the west-central coast of Florida, from Charlotte County in the south to Levy County in the north. It also extends from the Gulf of Mexico east to Polk and Highlands counties. The District contains 98 local governments spread over approximately 10,000 square miles, with total population in 1998 of about 3.8 million (Bureau of Economic and Business Research (BEBR), 1998). Figure 2 shows county boundaries, as well as the locations of major cities within the District.

Section 3. SWFWMD Today

The SWFWMD is governed by an 11-member board that is appointed by the Governor and confirmed by the Senate. Board members, who must live in the District, serve staggered four-year terms. The District's primary funding source is ad valorem taxes, although revenues are also derived from state and federal appropriations, permit fees, interest earnings and other sources.

The taxing capabilities of the District are established by the Legislature within the limits set by the Florida Constitution. The limit for the SWFWMD is one mill, or one dollar per thousand dollars of assessed value.

The SWFWMD is further divided into nine basins, eight of which have separate Basin Boards (activities within the Green Swamp Basin are funded by the Governing Board). Members of the Basin Boards are also appointed by the Governor, confirmed by the Senate and serve three-year terms. These Boards identify water-related issues and problems in their basins, and provide programs and budgets to address these concerns. At present, the SWFWMD is the only water management district with this form of basin system.

The one mill taxing capability of the District is divided evenly between the Governing Board (0.5 mill) and the District's eight Basin Boards (0.5 mill). Governing Board millage for fiscal year (FY) 2000 is 0.422 mill, the same as it has been since 1994. Basin millage rates for FY 2000 range from 0.160 to 0.401.

The organizational structure of the District is reflected in Figure 3. It shows the District is administered by the Executive Director, who is appointed by the Governing Board and is empowered to hire staff to conduct the business of the District. During FY 2000, the SWFWMD will have total Board authorized staff of 735, with an operating budget of approximately \$63 million. The FY 2000 total budget for all funds is about \$197 million.

Figure 1.

Evolution of SWFWMD Responsibilities

1960s

Structural Flood Control (Four River Basins Project)
 Works of the District Permitting
 Well Construction Permitting
 Wellfield Regulation

1970s

Movement towards Non-Structural Flood Control
 Consumptive Water Use Permitting
 Minimum Flows and Levels
 Aerial Mapping and Floodplain Delineation
 Management and Storage of Surface Waters (MSSW) Permitting
 Quality of Water Improvement Program (QWIP)

1980s

Save Our Rivers Program (Land Acquisition)
 Groundwater Inventories
 MSSW Major Rule Revisions

- Wetlands Protection
- Water Quality

 Wetlands Protection (Warren Henderson Act)
 Ambient Groundwater Quality Monitoring Program
 Surface Water Improvement and Management Program (SWIM)
 Local Government Planning Assistance Program
 Well Construction Permitting in Areas of Groundwater Contamination
 Water Conservation/Water Shortage Planning

1990s

Water Resource Assessment Projects (WRAPs)
 Water Use Caution Areas (WUCAs)
 Environmental Resource Permit (ERP)
 Year-Round Conservation Measures
 Xeriscaping™ Incentive Rule
 Ambient Surface Water Quality Monitoring
 Preservation 2000/Florida Forever (Land Acquisition)
 District Water Management Plans
 Regional Water Supply Planning
 Budget Reporting/Performance Measurement

Source: SWFWMD, Planning Department, December 1999

Figure 2.

Southwest Florida Water Management District

Location Map

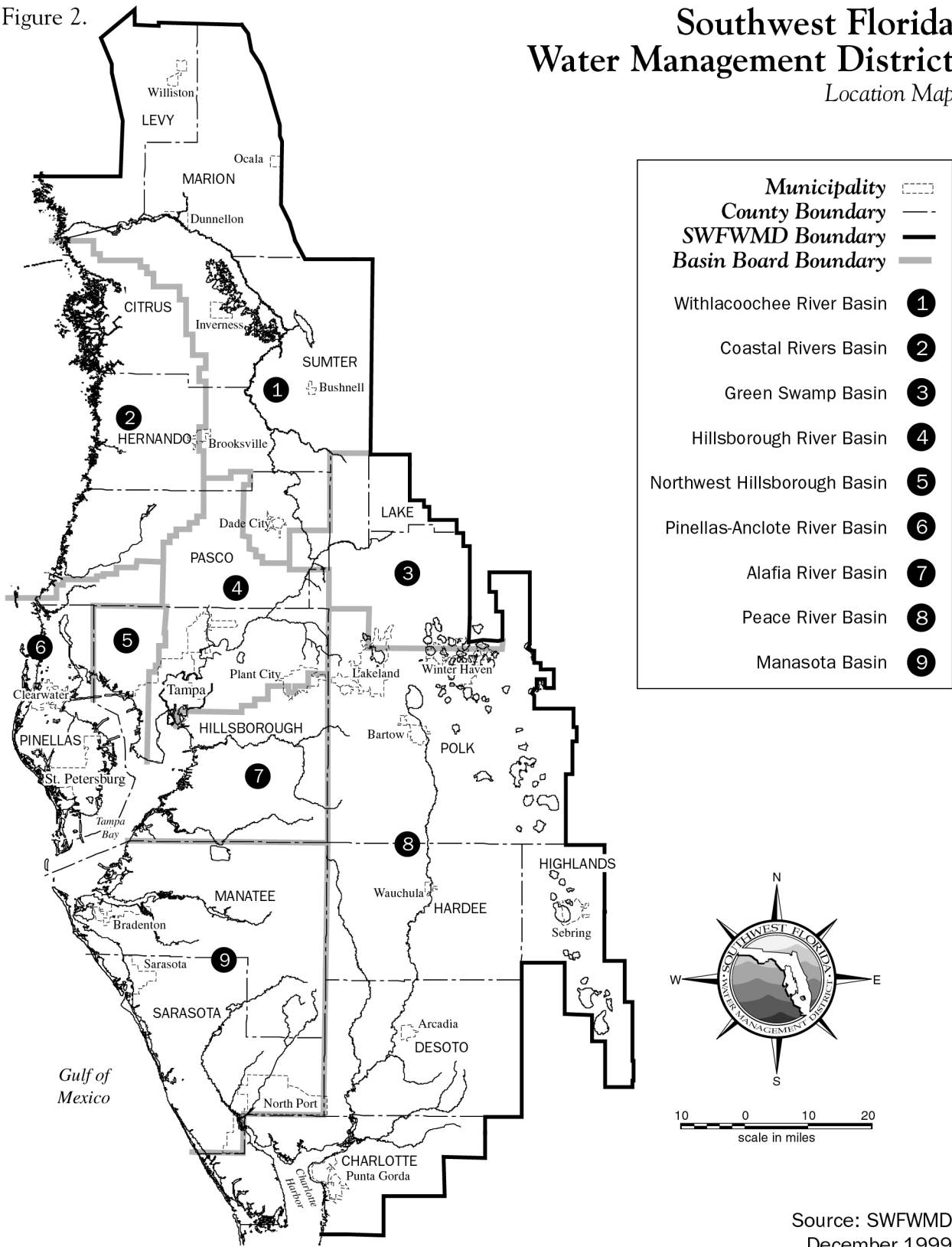
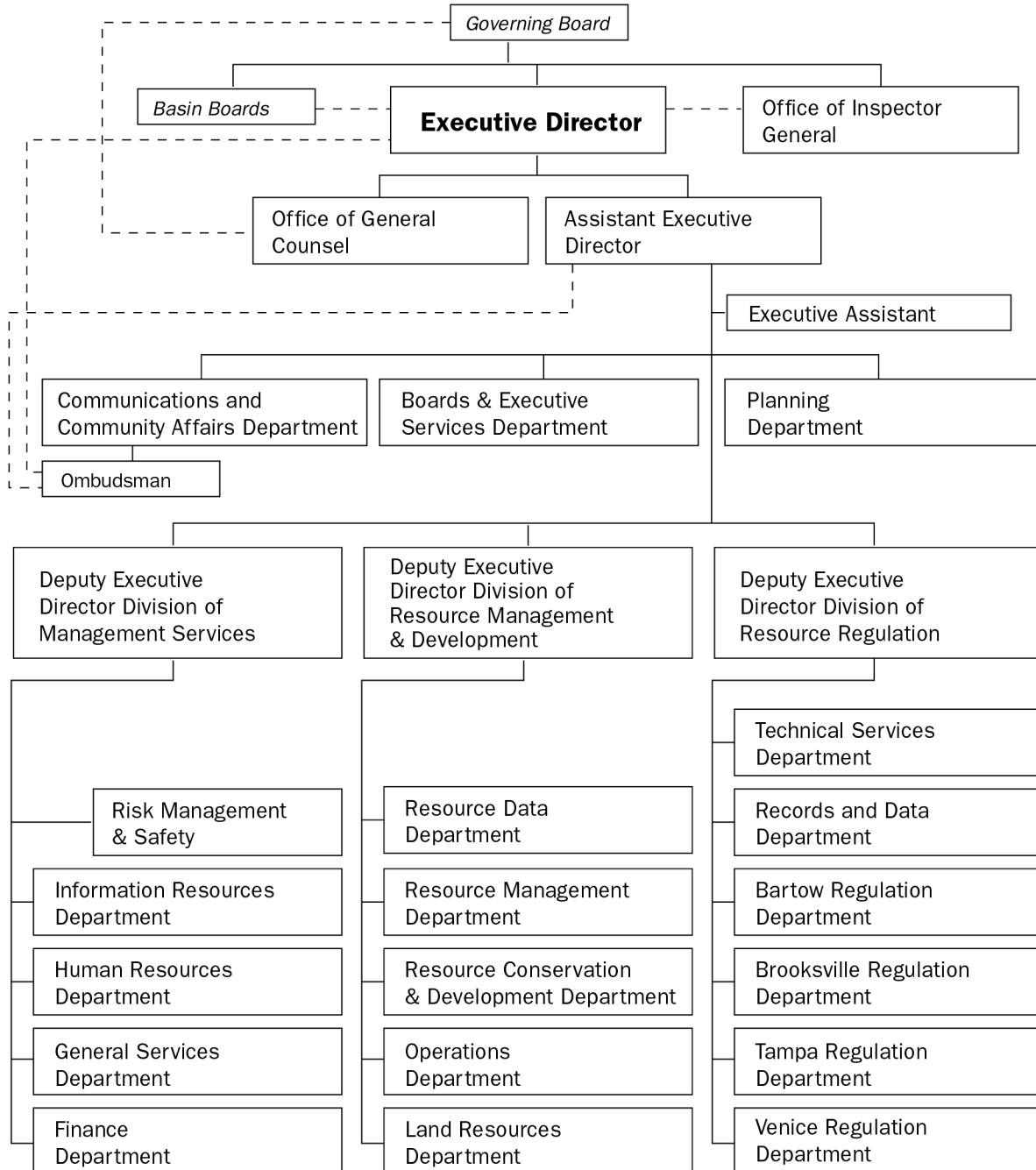


Figure 3.

SWFWMD Staff Organization



Source: SWFWMD, Human Resources Department
February 2000

Part B. Physical Setting

Section 1. Physiography and Topography

The SWFWMD is located in the Gulf and Atlantic Coastal Plain physiographic province of the United States. While the District consists of many physiographic regions, most of the land it contains is flat, such as land in the Gulf Coastal Lowlands and the DeSoto Plain, where numerous wetlands are interspersed with pine-palmetto flatwoods. Land surface in the SWFWMD ranges in elevation from sea level along the Gulf coast to more than 300 feet above mean sea level at Clay Hill in north-central Pasco County. Higher elevations are associated in particular with three ridges, the Brooksville, Lakeland and Lake Wales ridges, aligned with the Florida peninsula.

Another significant feature of the District is karst topography. In these areas, water-soluble limestone below the Earth's surface has dissolved, causing the land surface to sink or collapse and, often, to fill up with water. This condition, most common in the northern and eastern regions of the District, is often referred to as sinkholes. They can range from a few meters in diameter to a square kilometer or more.

Karst considerations, in turn, raise another important point: much of southwest Florida's geology is such that surface and ground waters are closely interrelated. Lake levels often are a direct reflection of groundwater levels; spring flow and seepage constitute the base flow of many streams; freshwater wetlands retard and store floodwaters and enhance infiltration to groundwater; and stream discharges to estuaries are critical for maintenance of salinity regimes. These interrelationships are the basis of the state's and this region's ecological systems.

Section 2. Climate

The SWFWMD is located in the humid subtropical climate that prevails over much of the southeastern United States, but the more southerly parts of the District have climatic characteristics that mark a transition zone between that climate and the quasi-tropical climate of southernmost Florida. Frost and freezing temperatures can be expected to occur at least once a year in all areas north of Tampa Bay and at most inland locations south of Tampa Bay. Average annual rainfall in the SWFWMD is approximately 53 inches, but is highly variable both seasonally and from year to year. About 60-65 percent of annual rainfall typically occurs between June and September when evaporation rates are highest. These rains are generally associated with thunderstorms and can cause widespread flooding. It is important to note that while some water supplies in northern Florida originate in Georgia or Alabama, southwest Florida is primarily dependent on rainfall that occurs within the District's boundaries.

Section 3. Major Biotic Communities

The District encompasses a wide variety of terrestrial and aquatic systems. All of these systems, or associations, from the high and dry scrub oak to the estuaries, are dependent to varying degrees upon fresh water. In fact, the association present in any particular area is usually dependent upon the amount of water obtainable. This is why good water management must include consideration not only of human needs, but also of the needs of natural systems.

The use of the term "natural systems" in this context includes native vegetation associations, all of the wildlife types that inhabit these areas and their interaction under natural and man-made conditions. Four basic environments, each with their particular associations, can be readily identified within the District: (1) dry (or upland); (2) mesic; (3) wet; and (4) coastal.

Additional information on each of these biotic communities can be found in Ecosystems of Florida (Ewel and Myers, 1990), among other sources.

Part C. Cultural Resources

The SWFWMD is home to more than one-fourth of the state's population, or approximately 3.8 million people, with the largest concentration in the Tampa Bay metropolitan area. The region is diverse and includes some of the state's most productive agricultural lands, as well as high growth urban areas along the Gulf coast. Phosphate and other mining, industrial and power generation activities, and tourism/recreation reflect the broad-based economic environment within the District.

Section 1. Population Characteristics

The SWFWMD boundaries encompass a rapidly-growing region. The majority of the SWFWMD's population growth has been due to net migration, as opposed to natural increase. Approximately 2.5 million people lived within the SWFWMD in 1980, but this had grown to 3.3 million permanent residents by 1990, and to 3.8 million by 1998, a net increase of about 52 percent over just 18 years. Table 1 projects the change in county populations by amount and percent increase through the year 2020. Five counties within the District (Charlotte, Hernando, Lake, Sumter and Marion) are expected to experience population increases in excess of 50 percent during this 20-year period.

Table 1. Population Estimates and Projections, 1990-2020

County	1990	1998	2010	2020	% Increase 1998-2020
Charlotte*	110,975	133,655	172,100	204,900	53
Citrus	93,515	112,424	141,600	166,600	48
DeSoto	23,865	27,927	33,900	38,200	37
Hardee	19,499	22,801	23,900	24,700	8
Hernando	101,115	125,008	163,800	197,200	58
Highlands*	68,432	72,493	88,028	101,272	40
Hillsborough	834,054	942,322	1,094,808	1,224,900	30
Lake*	1,521	1,961	2,560	3,076	57
Levy*	14,854	18,547	23,378	27,504	48
Manatee	211,707	247,028	298,000	341,100	38
Marion*	42,238	54,773	69,879	82,582	51
Pasco	281,131	321,074	381,000	431,300	34
Pinellas	851,659	892,178	955,200	1,008,800	13
Polk*	388,356	449,087	523,838	586,498	31
Sarasota	277,776	316,023	371,200	417,400	32
Sumter	31,577	47,907	64,600	79,100	65
District Totals	3,352,274	3,785,208	4,407,791	4,935,132	30

Data only for that portion within the SWFWMD (partial counties indicated by *).

Projections include year-round resident population only.

Source: Projections of Florida Population by County 1990-2020. Bureau of Economic and Business Research (BEBR), February 1998.

An additional feature of population data in the SWFWMD is the annual peaks created by the influx of seasonal residents, predominantly retirees who also have a residence outside the District. These visitors create a seasonal water use effect, especially in coastal counties and other communities that attract large numbers of retirees. This situation calls for both local and regional strategies to address such issues as adequate water supply (including delivery systems), adjustments to per capita calculations aimed at realizing water conservation and ongoing education of citizens on the importance of conserving and protecting the water resource. Consistent education of seasonal visitors who may be unaware of the limitations of water resources is especially important.

In terms of population density, the SWFWMD's jurisdiction again reflects a diverse region. Based on permanent residency, the District's average population density was 378 persons per square mile (ppsm) in 1998, ranging from a high in Pinellas County of 3,221 ppsm to a low of 19 ppsm in Lake County. Recent projections indicate that the average population density in the SWFWMD will be 494 ppsm by the year 2020. This represents a 30 percent increase during a 20-year period. Higher population densities underscore the need for regional solutions to water supply development strategies in the District.

Section 2. Population Trends

The largest projected increase in population for the year 2020 will occur in the developed areas surrounding Tampa Bay (i.e., Hillsborough, Pasco, Manatee and Pinellas counties). Over 64 percent of the Districtwide increase (or nearly 650,000 additional residents) is expected in these counties. Sumter County is the fastest growing county in terms of percent population increase, with an expected 65 percent increase by 2020. Upward trends in both total and percentage population present challenges for water management. In the former case, the total

population to be served may grow beyond the facilities of water suppliers or exceed the limits of a given source. In the latter, rapid percentage increases in smaller counties often necessitate the transition from mostly agricultural to public supply uses in support of urbanizing areas, an expensive endeavor.

Recent population projections indicate that SWFWMD will be home to approximately 5 million permanent residents by the year 2020. This represents a 30 percent increase during the period, or roughly 1,005 new permanent residents each week. The predominant source of population growth in the District will remain net migration (more people moving to the area than leaving).

Section 3. Land Use

The use of land within the District is a strong indicator of water needs. Agricultural, industrial, commercial, residential, and other uses have particular requirements for fresh water. The land-use categories shown in Table 2, and depicted in Figure 4 are derived from the Florida Land Use, Cover Classification System (FLUCCS). The FLUCCS is used by the Mapping and Geographic Information System (GIS) Section of the SWFWMD and other districts in the creation and maintenance of land-use and cover maps. The FLUCCS was developed in 1976, updated in 1985, and updated again in 1995 to improve land resources data coordination.

The land use that currently accounts for the greatest percentage of land in the District is agriculture, which occupies 31.1 percent of the area. This is followed by urban uses, such as residential, commercial and industrial which take up approximately 22.8 percent of the total land area. About 16.8 percent is in upland forest, while wetlands occupy 18.2 percent.

Table 2. Land Use/Land Cover Types in the SWFWMD

Land Use/Land Cover Types 1995	Acres	Percent
Urban and Built-up	1,148,134.35	18.1
Agriculture	1,971,754.07	31.1
Rangeland	398,778.87	6.3
Upland Forest	1,063,097.04	16.8
Water	224,671.35	3.5
Wetlands	1,151,307.33	18.2
Barren Land	8,308.53	0.1
Transportation and Utilities	74,677.44	1.2
Industrial and Mining	292,991.83	4.6
Total	6,333,720.81	100.0

Source: FLUCCS & SWFWMD (GIS Department), December 1999.

Part D. Surface Water Resources

The District has identified 11 primary watersheds within its jurisdiction, utilizing previous work done by the United States Geological Survey (USGS) (see [Watershed Management](#) section). Each of these watersheds can be further subdivided into subbasins, based on specific surface water features or drainage patterns. This section provides a broad overview of surface water resources in the District, and is supplemented by the [Watershed Management](#) section which provides watershed descriptions and management issues associated with the District's ongoing Comprehensive Watershed Management (CWM) initiative.

Southwest Florida, like the state as a whole, is replete with a variety of surface water features. Surface water bodies such as rivers, springs, lakes, and estuaries are among Florida's most valuable assets, not only for their inherent aesthetic and

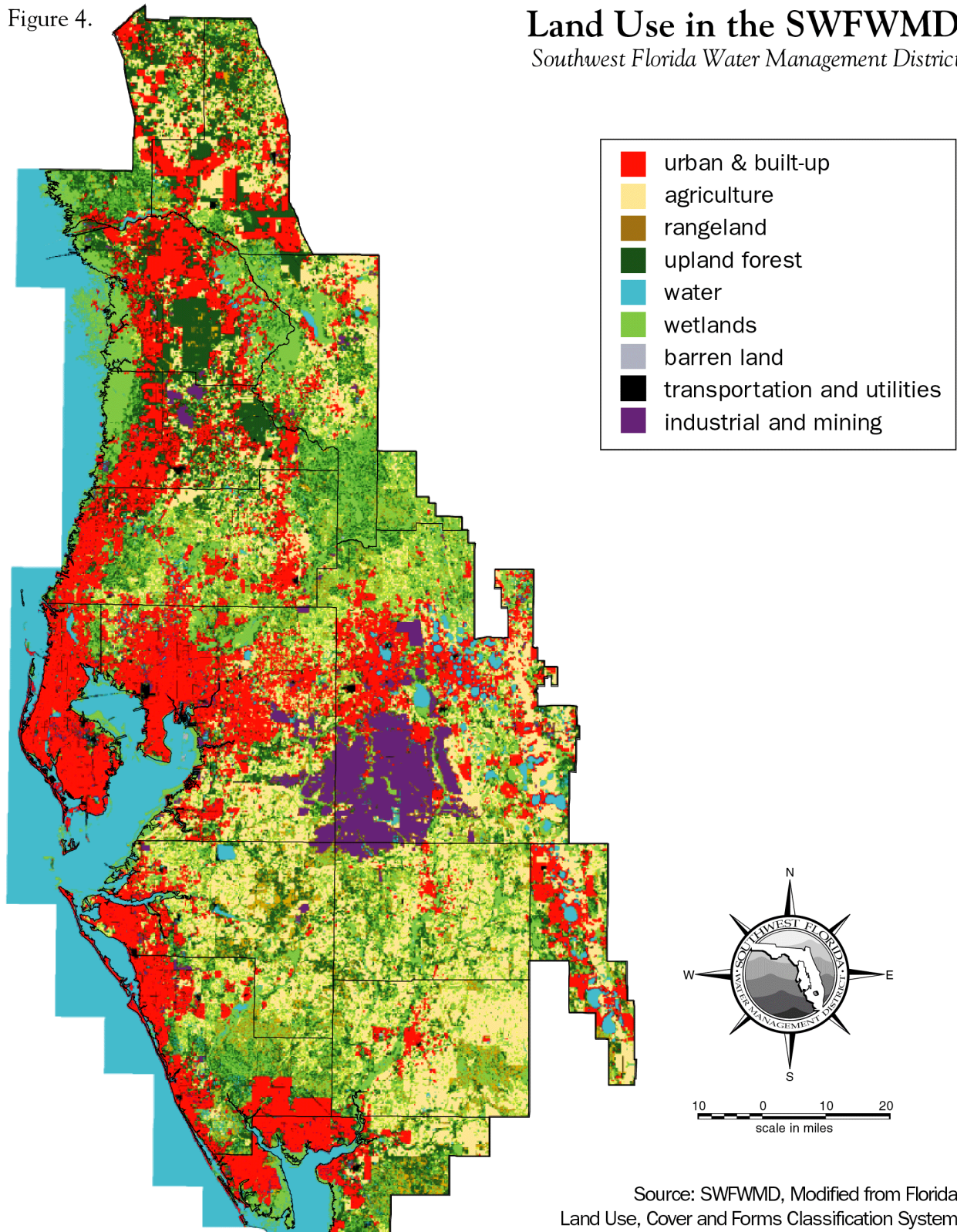
ecological values, but also for their significant economic contributions to tourism, sport and commercial fishing, real estate development, and quality of life in the state. Another functional component of surface water resources is their role as public water supply sources. There are six of these in the District, including those located in Tampa, Bradenton, North Port, Punta Gorda, Manatee and DeSoto counties.

The western coastline of the SWFWMD is punctuated by 13 major rivers and numerous smaller streams, canals and waterways. The rivers are highly varied in terms of geology, origin of discharge, water quality and ecology. A striking feature is the range of combinations between groundwater and surface runoff contributing to the flow of each river. The relative contribution of groundwater affects flow, water chemistry and the biota of each system. Water quality is generally regarded as good throughout the region's rivers, although a number of sections are degraded. Major threats

Figure 4.

Land Use in the SWFWMD

Southwest Florida Water Management District



Source: SWFWMD, Modified from Florida Land Use, Cover and Forms Classification System September 1999

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to river ecosystems and water quality include habitat destruction in floodplains and along shorelines, point and non-point source pollution (e.g., effluent from septic tanks, treatment plants and heavy industry; agricultural and urban stormwater runoff) and flow reductions as a result of water withdrawals.

Approximately 1,800 lakes that are ten acres in size or larger are found in the SWFWMD, or about 23 percent of all such lakes in Florida. Polk County has the greatest number of lakes within the District, ranking fourth among all the counties in the state. The District is unique in that it has a wide variety of lakes, from shallow wet-weather ponds to very deep lakes formed by sinkholes. Sizes range from small ponds to several vast lakes over 4,000 acres in size. Development pressures on lake shorelines and increased competition among different types of lake users has brought an increased awareness of the value of these resources. In recent years, declines in water quality and resultant reductions in recreational and commercial value have heightened public attention. Just one example in the District is the Lake Tsala Apopka chain of lakes in the Withlacoochee watershed where a comprehensive effort to balance such responsibilities as flood protection, water supplies and natural systems is well underway. The District has a long-standing lake level guidance program (discussed in the [Natural Systems](#) section) that incorporates substantial citizen participation and provides enhancement of public awareness on the roles and values of these water bodies.

Estuaries can be described as semi-enclosed water bodies which have an open connection to the sea where there is a mixture of fresh and salt waters. Essentially, estuaries are transitional zones between fresh water and marine ecosystems. From the perspective of water management, it is the alteration of natural cycles of freshwater inflows that must be managed if estuarine resources are to be protected. The timing and volume of freshwater inflows are

probably the most important factors controlling the physical, chemical and biological characteristics of estuaries. Freshwater inflows perform important ecological functions, such as the establishment of circulation patterns, regulation of salinity levels and the delivery of nutrients and sediments to estuaries.

In coastal states such as Florida, estuaries are extremely valuable resources because of the crucial role they play in marine fisheries production. It has been estimated that 70 to 74 percent of the species comprising the sport and commercial fisheries of the Gulf of Mexico are dependent upon estuaries at some point in their life cycles. Based on poundage landed, these estuarine-dependent species comprise 90 to 97 percent of the commercial catch and 80 percent of the recreational catch landed from the Gulf of Mexico. The District has conducted a number of studies and data collection efforts related to the freshwater inflow needs of the region's estuaries.

Major estuaries of the SWFWMD include Tampa Bay, Sarasota Bay and Charlotte Harbor, as indicated by their designation under the National Estuary Program (NEP), and the coastal area between the Weeki Wachee and Withlacoochee rivers. Integrated watershed management is an important theme for priority estuaries in the District, as illustrated by planning and programs of the NEP and the District's Surface Water Improvement and Management (SWIM) program.

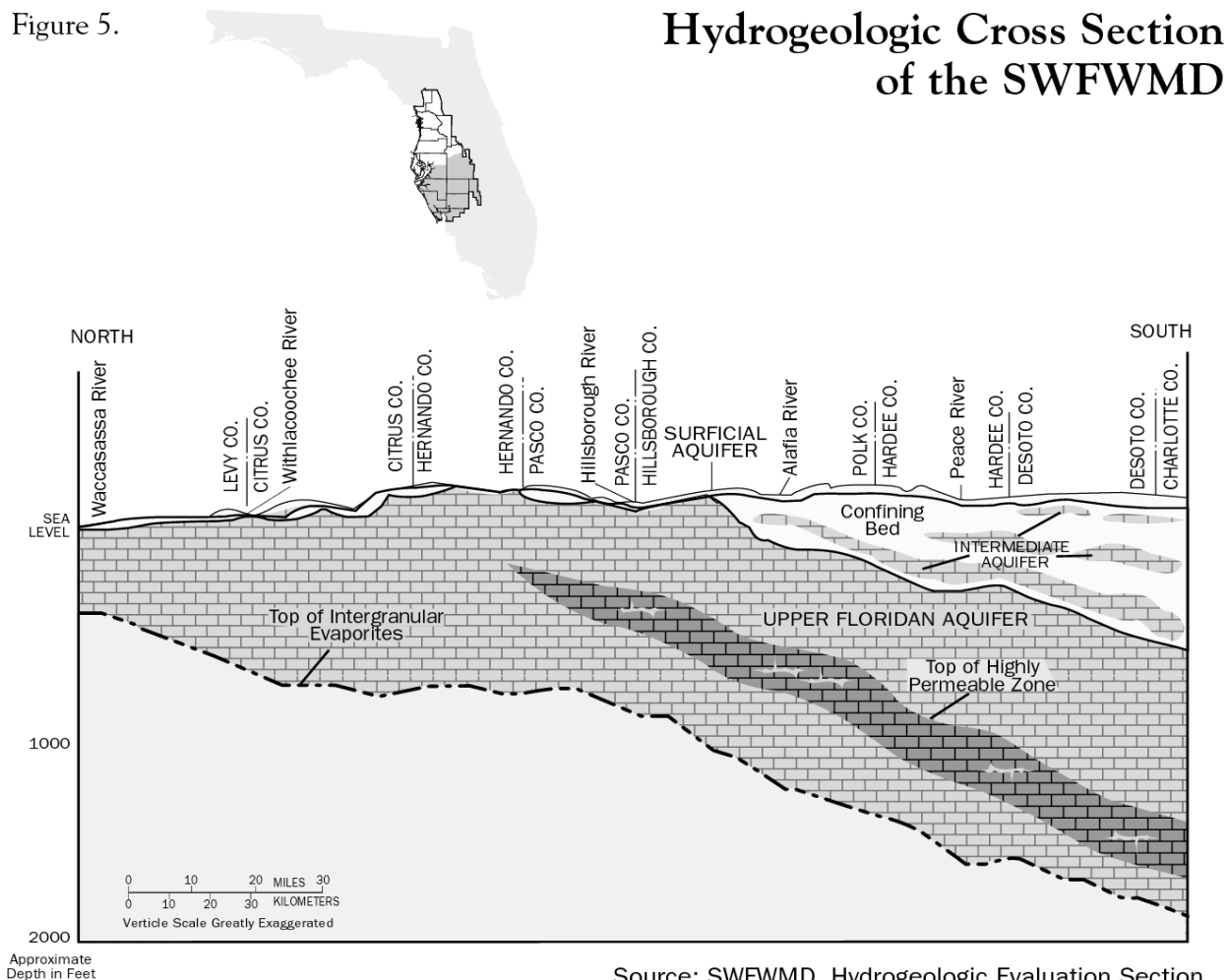
Approximately 18.2 percent the total land area in the SWFWMD is wetlands, with wetland hardwood forests the primary category. This means that over 1.1 million acres within the District are wetlands. The District maintains wetland information for all the counties within its boundaries. This data is available to local governments and is also used by the District as one layer for its land acquisition Site Identification Model (discussed in greater detail in the [Natural Systems](#) section).

Part E. Groundwater Resources

Groundwater resources play a highly significant role in the SWFWMD. Over 80 percent of all water used emanates from this source. Groundwater generally provides a dependable year-round supply and is available throughout much of the District, but has increasingly been recognized as a limited resource. These limitations mean that the only way to maintain these resources is to withdraw no more than is replaced. In the SWFWMD, the sole source of natural replenishment is rainfall.

Three different aquifers are found in the District. These are the water table or surficial, the intermediate and the Floridan, which is the deepest and most productive of the three. Withdrawals from the surficial aquifer are usually small, but are significant along the central ridge where the thickness of sands is substantial and hence the aquifer is more productive than in most areas. The surficial aquifer is also used in the southwestern portion of the District. The intermediate aquifer occurs only in the southern part of the District as can be seen in Figure 5. Users in Polk, Sarasota, Highlands, Hardee and DeSoto counties rely on the intermediate primarily for groundwater public supply, domestic self-supply and agricultural water use.

Figure 5.



Most groundwater is pumped from the deepest of the formations, the Upper Floridan aquifer, and exhibits a fairly constant temperature and dissolved solids content. In the coastal areas of the District, a zone of transition from fresh to saline water occurs. Under the southwestern part of the District, the Floridan has moderate to relatively high concentrations of sulfate, which limit its use. These concentrations increase with depth and also increase toward the coast, where higher chloride concentrations also occur. The Upper Floridan aquifer system is the most productive, supplying more than ten times the amount of water pumped from either the surficial or intermediate aquifer systems. However, the importance of the Floridan system as a source of potable water diminishes as water quality deteriorates in the south. In this area, concentrations of dissolved solids, chlorides and sulfates exceed maximum recommended drinking water standards and require more expensive treatment technologies.

In the SWFWMD, the characteristics of the groundwater system vary from north to south. The District is comprised of three major groundwater basins (see Figure 6), with the northern and southern boundaries of the central basin roughly following a line that splits Pasco County diagonally, and Interstate 4, respectively. The Central Basin represents a transition zone between the Northern and Southern basins, characterized by an increasing degree of aquifer confinement from north to south. In the northern portion of the District, the Floridan aquifer rises to near the land surface and is largely unconfined. As a result, the groundwater system is readily recharged by rainfall. This system is highly productive due to the high transmissivity of the aquifer. However, these characteristics also result in a high susceptibility to groundwater contamination.

Groundwater resources in the southern portion of the District are distinctly different in that the Floridan aquifer is further below land surface and is separated from the surficial system by

semi-permeable clay layers. This significantly inhibits recharge in many areas, particularly along the coast. As noted above, the quality of groundwater deteriorates in the southern region.

Groundwater recharge to the Floridan aquifer is generally high in the northern and easternmost portions of the District and more variable to the south. Recharge also correlates to susceptibility to contamination of groundwater in these areas of the District. The southern portions of the Upper Floridan aquifer are less susceptible to pollution, primarily due to the thickening of overlying clay units. The surficial aquifer system, however, is very vulnerable to contamination throughout the region. A map of generalized groundwater recharge, and additional discussion of this topic, can be found in the [Water Supply](#) section.

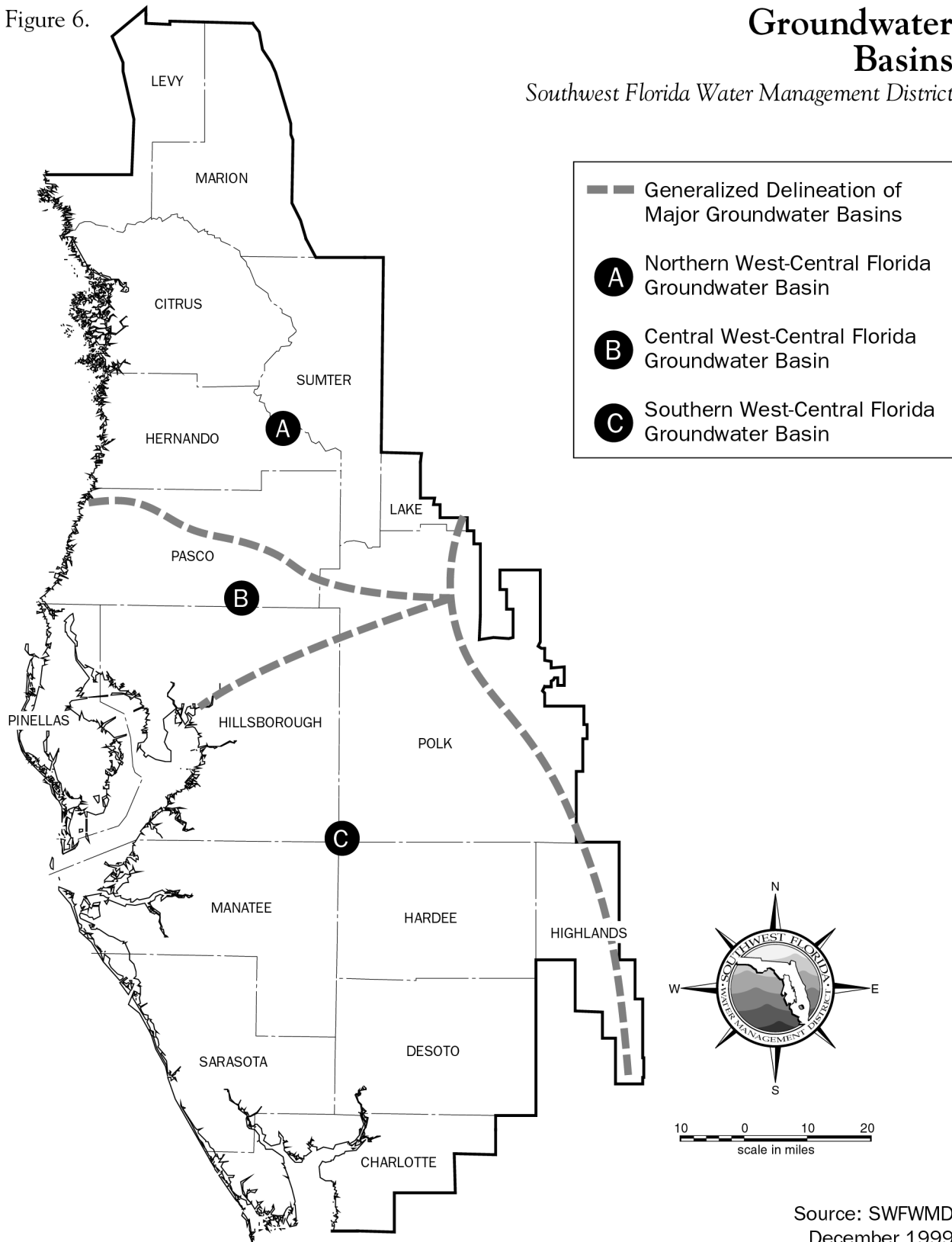
Groundwater can be pumped so heavily that the water level under an area sinks deeper and deeper, or the potentiometric (or pressure) surface drops. Declining levels can result in numerous adverse impacts, including deterioration of water quality. Florida's freshwater aquifer system is surrounded by saline water, and permanently lowering water levels invites the intrusion or upconing of saline water into previously freshwater zones. In areas of the District not directly threatened by saltwater intrusion where the groundwater system is directly connected to surface water, overpumping can reduce spring flow, and lower wetland and lake levels.

By 1989, the District recognized three distinct areas in which groundwater resources were stressed (i.e., Northern Tampa Bay, Eastern Tampa Bay and Highlands Ridge). Specific use factors, as well as long-term drought impacts, were identified in each area. These "critical water resource areas" were designated as Water Use Caution Areas (WUCAs) by the District Governing Board the same year. Subsequently, in 1992, the entire Southern Groundwater Basin

Figure 6.

Groundwater Basins

Southwest Florida Water Management District



of the District was similarly designated as a step toward achieving resource protection. The Southern Water Use Caution Area (SWUCA) evolved from recognition by the District that the entire Southern Groundwater Basin (including the Eastern Tampa Bay and Highlands Ridge WUCAs) is a unified water resource system that must be addressed accordingly. Further discussion, including a map of the WUCAs, can be found in the [Water Supply](#) section.

The stress on water resources in the Northern Tampa Bay WUCA is primarily due to population-related water use. There has been a great deal of urban development in the area. In addition to producing higher demands for water, this development has reduced local groundwater recharge by decreasing the amount of permeable area. Significant impacts in this WUCA include: loss of wetlands, lowered lake levels, deterioration of groundwater quality, and reduced wellfield production levels. An overall strategy to reduce reliance on groundwater, implement alternative sources and allow recovery of natural systems was put in place in May 1998 with the approval of the Northern Tampa Bay New Water Supply and Groundwater Withdrawal Reduction Agreement (or Partnership Agreement) by the District, Tampa Bay Water (formerly the West Coast Regional Water Supply Authority) and its member governments (Tampa, St. Petersburg, New Port Richey and the counties of Hillsborough, Pasco and Pinellas).

The key objectives identified in the Agreement are the development of new water supply, the phased reduction of pumpage from the existing 11 well fields in Northern Tampa Bay, the ending of litigation, and financial assistance from the District for new water supply development and conservation. The phased reductions included in the Agreement specify that the combined production from the 11 well fields shall be limited to an annual average daily quantity of 158 million gallons per day (mgd) until December 31, 2002, at which time the

quantity will be reduced to 121 mgd. As of December 31, 2007, the permitted annual average quantity from the 11 well fields shall be further reduced to 90 mgd.

As part of the Agreement, Tampa Bay Water must have one or more projects permitted, constructed, in operation and providing at least 38 mgd of new supply by December 31, 2002. Furthermore, by December 31, 2007, Tampa Bay Water must have the remaining projects permitted, constructed, in operation and providing an additional 47 mgd, for a total of at least 85 mgd of new water supply for regional distribution to its members. The District has agreed to provide \$183 million to assist Tampa Bay Water with the task of providing at least 85 mgd of new supply. These funds are to be used for projects that the District deems "eligible," i.e., primarily sources other than traditional groundwater withdrawals, such as desalinated seawater, surface water development and system interconnections.

Water resource concerns associated with the SWUCA involve the decline of lake levels along the Highlands Ridge and advancing saltwater intrusion in coastal regions. Data show the potentiometric surface in the Floridan aquifer has declined significantly during the past 40 years. Information provided by the USGS reveals seasonal declines as great as 50 feet in 1989. Water quality monitoring shows increasing trends for sulfates, total dissolved solids and chlorides across the coastal counties. Many lake levels in the Highlands Ridge area have also declined significantly, in some cases as much as 20 feet.

In 1994, the District Governing Board approved a SWUCA rule intended to implement the regulatory portions of a management plan developed in conjunction with a SWUCA Work Group of affected parties. Objectives of the rule were to: (1) significantly halt saltwater intrusion into the confined Floridan aquifer along the coast, (2) stabilize lake levels in Polk and

Highlands counties, and (3) limit regulatory impacts on the region's economy and existing legal users. The rule was ultimately challenged and remains in an appeal process as of late 1999.

The District has continued to monitor resource conditions in the SWUCA, including trends in water use, hydrologic conditions, ground and surface water levels and water quality. Recent changes in these and related factors (including 1997 legislation on minimum flows and levels that allow use of a "recovery strategy") resulted in a 1998 Governing Board determination to reevaluate the management approach for the SWUCA.

Among these factors is the finding that total permitted quantities from the Floridan aquifer in the SWUCA have actually **declined** by approximately 65 mgd during the time period from October 1992 to July 1998. This decline in permitted quantities is attributable to a number of factors, including consolidation of operations and improved efficiencies within the phosphate industry, retirement of permitted quantities associated with lands purchased by the District and others for conservation purposes, improved efficiencies and conservation measures imposed during the renewal of existing water use permits, and the development of alternative sources to meet both existing and new demands.

Not only have permitted quantities declined, but significantly, so have actual withdrawals from the Floridan. In 1989, groundwater withdrawals in the SWUCA were estimated at 832 mgd, while by 1996 such withdrawals had declined over 200 mgd to an estimated 627 mgd. In 1997, estimated groundwater withdrawals were about 611 mgd. Although this brief period may not be adequate to fully characterize long-term trends, it certainly calls into question the assumption of continuous increases in demand incorporated into the original SWUCA Management Plan. A number of factors have likely influenced these reductions in withdrawals, not the least of which has been

District actions to implement the provisions of the existing water use permitting rules (including those provisions specific to the Highlands Ridge and Eastern Tampa Bay WUCAs), development of alternative sources, economic factors and more normal rainfall conditions. Clearly, water use is variable in the area, and the District will remain vigilant to assure sustainable use of groundwater resources is maintained.

Accompanying the reduction in groundwater withdrawals has been an observed improvement in resource conditions. Groundwater levels have generally improved in the SWUCA since 1989. The five-year average groundwater levels for 1995, 1996 and 1997 have been above the originally proposed SWUCA minimum levels in most of the area. As a result of the increased groundwater levels and rainfall, lake levels have increased in previously stressed lakes. Although groundwater quality in the deep coastal portions of the Upper Floridan aquifer has continued to show deterioration, the increased groundwater levels indicate a much less serious problem than previously anticipated. More information on conditions in the SWUCA, and the District's response to them, can be found in two recent publications: the [SWUCA Information Report](#) (April 1998); and the [Southern Water Use Caution Area Conceptual Management Strategy](#) (September 1998).

Part F. Water Use

The SWFWMD periodically summarizes and analyzes freshwater use in the 16 full and partial counties that are within its jurisdiction. Data for each partial county only includes the water use for that portion of the county that is within the District.

Each WMD addresses various permitting and planning issues that require water use data with differing levels of detail. Care has been taken in this document to identify when technical differences are present. In addition, the five

water management districts and DEP have worked together to identify a “Water Use Categories Convention” with which all parties can be consistent. Consistent documentation will allow meaningful comparisons of water use for regional areas, impacts of conservation activities and other needed information.

Section 1. Current Water Use (1997)

The SWFWMD has documented historical water use in a series of reports entitled Estimated Water Use in the Southwest Florida Water Management District since 1984. The first report examined water use that occurred in calendar years 1981 and 1982. Calendar year 1997 data are featured in the most current report. Water use information for years prior to 1981 is available from the USGS, but differences in methodologies and level of detail create statistical aberrations that make long-term analysis difficult.

Six broad categories of water use have been analyzed by the District: Public Supply, Domestic Self-Supply, Recreational/Aesthetic, Agricultural, Industrial/Commercial, and Mining/Dewatering. These categories generally correspond to the "predominant use" classifications used in the water use permitting program.

Table 3 summarizes calendar year 1997 estimated water use for these categories by county. In 1997, an average of approximately 1.3 billion gallons of fresh water was withdrawn each day within the District. This represents a decrease of about 200 mgd from 1990 average daily withdrawals. Approximately 82 percent of this amount was from groundwater sources. The four counties in the SWFWMD with the highest freshwater withdrawals are Polk (294.4 mgd), Hillsborough (258.8 mgd), Pasco (144.8 mgd) and Manatee (124.7 mgd).

Table 3. Summary of Total Water Withdrawal/Use (mgd) by County and Category, 1997

County	Agricultural	Industrial/Commercial	Mining/Dewatering	Public Supply Withdrawal	Domestic Self-Supply	Recreation/Aesthetic	Total Withdrawal	Public Supply (Use)	Total Use
Charlotte	14.008	0.016	1.349	6.199	5.694	2.540	29.806	12.054	35.661
Citrus	1.411	0.816	9.245	11.359	7.020	6.141	35.992	11.541	36.174
DeSoto	64.625	0.029	0.093	12.482	2.215	0.439	79.883	1.101	68.500
Hardee	55.339	0.111	2.211	1.568	0.629	0.158	60.016	1.582	60.030
Hernando	2.405	8.610	11.188	18.215	1.534	5.088	47.040	19.205	48.030
Highlands	50.200	0.157	0.743	7.647	2.275	2.474	63.494	9.117	64.964
Hillsborough	66.336	15.330	1.326	151.674	10.393	13.776	258.835	116.563	223.724
Lake	1.256	0.000	0.000	0.000	0.234	0.000	1.490	0.000	1.490
Levy	5.508	0.001	0.000	0.916	2.774	0.328	9.527	0.891	9.502
Manatee	76.020	0.565	0.634	42.662	2.301	2.485	124.667	34.380	116.385
Marion	3.754	0.073	0.000	7.182	5.949	2.465	19.423	7.536	19.777
Pasco	14.238	8.560	8.828	97.295	11.300	4.577	144.798	34.501	82.004
Pinellas	0.557	0.076	0.052	33.605	2.993	8.347	45.630	114.733	126.750
Polk	112.076	41.045	59.786	63.690	8.958	8.808	294.363	66.986	297.659
Sarasota	5.693	0.112	1.014	25.653	4.572	7.551	44.595	31.978	50.920
Sumter	9.450	0.252	23.847	2.756	3.049	1.683	41.037	3.442	41.723
District	482.876	75.753	120.316	482.903	71.890	66.860	1,300.596	465.610	1,283.293

Source: *Estimated Water Use, 1997, SWFWMD.*

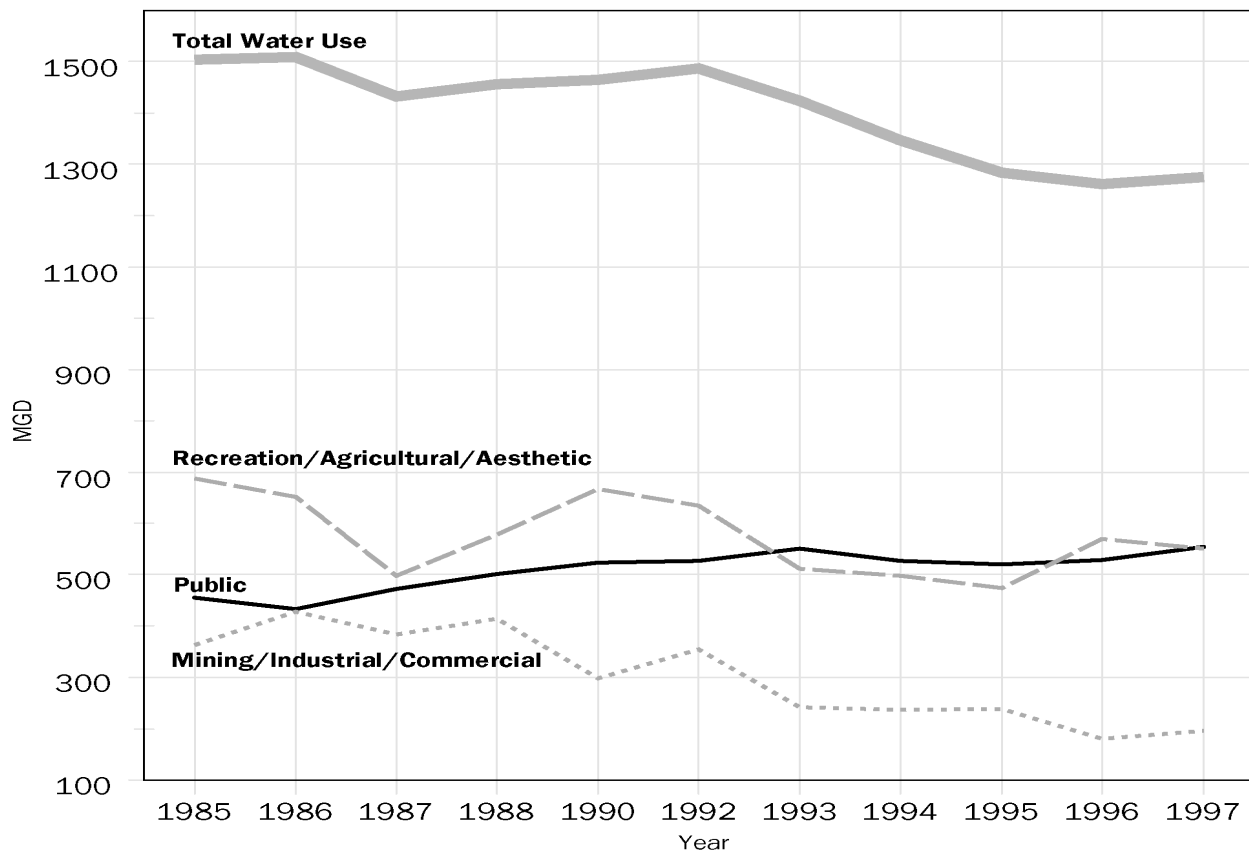
Based on estimates, as of 1997, public water use (including Public Supply and Domestic Self-Supply) constitutes the largest withdrawal category with about 43 percent (555 mgd) of total freshwater use. Agricultural water users constitute a significant category or sector, as well, using an estimated average of 483 mgd or 37 percent of total freshwater use. Within the Agriculture category, the crop with the greatest acreage and largest water use is citrus. Industrial and Mining water uses during 1997, about 196 mgd, were mostly for mining limestone and phosphate products, and processing them through phosphate-based chemical manufacturing. Golf courses were the primary demand for Recreational/Aesthetic water use of about 67 mgd.

Water use trend analysis is a complex process. It is possible, however, to generalize the major historical trends in water use in the SWFWMD (see Figure 7) as follows:

- ❖ Public water use (the combination of Public Supply and Domestic Self-Supply) has remained at about the same level since 1990, despite substantial population growth. This is further reflected in a decrease in annual gross per capita water use in the District from 144 to 128 gallons per person per day (1997), an 11 percent reduction.

Figure 7.

Total Water Use 1985–1997



Source: Districtwide Water Supply Assessment, SWFWMD, June 1998

❖ Recreational and Agricultural water use has fluctuated over time but statistically demonstrates a slight downward trend since 1990. The primary factor influencing the erratic fluctuation is periodic droughts and resulting increases in the need for supplemental irrigation. Potential for increases over time exist due to population-driven changes in demand for golf courses and other recreational facilities, and the expansion of irrigated agricultural lands.

❖ Industrial water use in the SWFWMD demonstrates a net decrease from 1986 through 1997. Although water use for this category is generally considered to be proportional to production levels, at least two product sectors have reduced their freshwater consumption per unit of production. Many phosphate-related operations have installed water-efficient technologies and internal recycling systems, and many power generation facilities with surface, brackish or reclaimed water available have met their needs with these sources.

Section 2. Projected Water Use

The District Governing Board accepted the “Districtwide Water Supply Assessment” in June 1998 (see Water Supply section for further

discussion). The Assessment represents the best available data for inclusion in this Plan on projected water supply needs throughout the District, and satisfies the requirements of Section 373.036(2)(b)4, F.S. In brief, the Assessment is an evaluation of water demands throughout the District, with projections made to the year 2020 based on both average and one-in-ten year drought conditions. These demands are then compared to the estimated availability of water sources over the twenty-year planning horizon to determine the adequacy of future water supplies.

The Assessment concludes that three of the four water supply planning regions will not have adequate water sources to meet projected demands to the year 2020. Table 4 shows the relationship of 1995 water use to the projected demands for 2020, as well as the percentage change expected. Overall water supply demands are expected to increase by over 50 percent by the end of the planning period. The District intends to continue refinement of demand projections through its regional water supply planning activities (underway as of August 1999) and future updates to the Assessment.

Table 4. Southwest Florida Water Management District Water Demand Projections (mgd)

Water Use Demand Category	Water Use 1995	Average 2020	% Change From 1995	Drought Year 2020	% Change From 1995
Public Supply	428.1	609.5	42%	638.5	49%
Domestic Self-supply	88.8	141.0	59%	149.6	68%
Industrial/Mining	226.8	196.0	-14%	196.0	-14%
Power Generation	10.2	61.8	505%	61.8	505%
Agricultural	684.7	852.0	24%	1,154.5	69%
Recreation	66.5	104.0	56%	109.2	64%
Totals	1505.1	1964.3	31%	2309.6	53%

Note: All projections are subject to updating as part of the development of the Regional Water Supply Plan.
Source: Districtwide Water Supply Assessment, June 1998, SWFWMD.

Section 3. Water Conservation

The SWFWMD has recognized the need to make water conservation a way of life in southwest Florida if the quality of life citizens have become accustomed to is to be maintained into the twenty-first century. In response, conservation efforts of both a regulatory and non-regulatory nature have been developed and implemented. The required conservation elements, as prescribed by permit conditions and by the rulemaking associated with WUCAs, are described within the Water Supply section. This section provides a brief overview of the significant incentive-based efforts of the District.

The SWFWMD Basin Boards have been providing funds for local water resource-related projects since the District's creation in 1961. Originally, the focus of the Basin Boards and the Governing Board had been on funding flood control projects. In the late 1980s, Basin priorities began to shift to the identification and funding of projects related to water conservation and the development of alternative water sources.

The District's non-regulatory water conservation program spans all water-use types, including agricultural, urban, industrial and recreational categories, and typically include public education components. Continual education efforts are especially important given the District's rapidly growing population and the need to constantly reinforce a conservation ethic aimed at changing the water use habits of the populace. Such efforts include in-school programs as well as those aimed at broader public awareness and action. The following represents a brief summary of these efforts:

❖ **Indoor Conservation.** The District continues to serve as an example of organizational commitment to conservation by retrofitting restrooms on District property with ultra-low volume plumbing fixtures and appropriate signage. Staff has developed a

model plumbing code, and has provided technical assistance to numerous local governments in this regard. The District also participated in research to determine the water savings of various methods and continues to fund large-scale plumbing retrofit programs at the local level through the provision of matching funds. Since 1992, the District has assisted local utilities in the distribution of nearly 64,000 ultra-low volume toilets, and 484,000 plumbing retrofit kits (including water efficient shower heads, faucet aerators and other items). The programs, which cost SWFWMD and cooperating local governments a combined \$17.2 million, yield an average savings of 6.5 million gallons of potable water per day.

❖ **Outdoor Conservation.** Outdoor water use can seasonally comprise 50 percent or more of the total demand placed on a water supply utility. Since the majority of this use is irrigation-related, the District emphasizes "environmentally friendly" landscaping (including Xeriscape™ and Florida Yards initiatives), outdoor water audits, leak detection surveys for utility systems and irrigation system efficiency analyses. This emphasis takes the form of public information and education, cooperative funding of demonstration projects, research, use of Xeriscape landscaping on District properties, development of a model landscape ordinance and the passage of a Xeriscape Incentive Rule. The District's standing advisory committees, including the Green Industry group with its "Water Budget" and Model Landscape Code projects, have also been active in promoting outdoor conservation.

❖ **Reuse.** The objective of the District's reuse initiative is to expand the use of reclaimed water for appropriate purposes such as irrigation for landscaping and crops, cooling, groundwater recharge and industrial processing in order to offset existing or future demands for limited water supplies. In funding reclaimed water projects, the District requires that at least 25 percent of the reclaimed water must offset existing or planned

ground or surface water withdrawals in order to qualify for funding consideration. This policy is intended to reduce the use of potable quality water for outdoor landscape irrigation and, where allowed by state regulations, to provide an alternative source of agricultural irrigation. Millions of dollars of cooperative funding have been invested Districtwide to seed reuse projects, including construction and expansion of reuse transmission lines, pump stations and storage facilities to deliver reclaimed water to golf courses, recreational fields, commercial entities, community green spaces and industrial users (see Table 5). These projects have been conservatively estimated to have already offset potable water use by about 92 mgd ("Retrofit Programs, Reuse Projects and Outdoor Water Conservation Efforts Summary Report," 1999).

❖ **Agricultural Research and Demonstrations.**

The District has funded research projects at all of the Institute of Food and Agriculture Sciences (IFAS) Research and Education Centers throughout the SWFWMD. Included are projects to design tailwater recovery systems and determine specific crop water-use requirements. Other projects include field irrigation scheduling demonstrations and frost and freeze protection demos. Still other projects address best management practices (BMPs).

Mobile irrigation laboratories, operated in conjunction with the Natural Resources Conservation Service (NRCS) conduct efficiency and conservation evaluations of agricultural irrigation systems. Finally, the District has made substantial progress in metering agricultural water use to obtain reliable, verifiable information on which to base conservation objectives.

Table 5. Summary of Reuse Projects by Basin Boards and Governing Board
(Including Reuse Projects Funded Through the New Water Sources Initiative (NWSI))

Governing Board/Basin Board(s) Providing Funding	Available Reclaimed Water + (GPD)	Gallons of Storage (Millions)	Amount(\$) Budgeted by District*
Alafia River	2,455,400	2.50	1,606,418
Coastal Rivers	12,500,000	12.6	9,206,448
Hillsborough River	7,345,400	12.00	7,033,242
Manasota	33,226,541	158.69	14,929,481
Northwest Hillsborough	9,405,400	5.00	5,882,558
Peace River	17,258,440	10.10	10,315,937
Pinellas-Anclote River	50,803,944	57.50	51,461,339
Withlacoochee River	1,921,000	3.95	1,443,400
Governing Board	39,105,379	168.31	18,724,082
Totals	174,021,504	430.65	120,602,905

+ Amount of treated water that has received at least secondary treatment and basic disinfection and is reused after flowing out of a domestic wastewater treatment facility.

*FY 87-FY 99 totals (amounts do not include Partnership Agreement funding).

Source: Retrofit Programs and Reuse Projects Summary Report, October 1998, SWFWMD.

Part G. District and Other Publicly Owned Lands

The purchase of lands (or specific interests in such lands) that provide significant water resource benefits is often considered the most effective way natural resources can be truly protected for the future. As our resources have become increasingly impacted and their importance better understood, this option has been pursued with greater vigor. Figure 8 shows properties within the SWFWMD that are currently under public ownership for conservation purposes. State agencies, local governments and others represent important partners in assuring adequate protection and management of the public domain. The SWFWMD has protected over 320,000 acres of land that furthers our mission to manage and protect the water resource.

All District land holdings have at least one thing in common – their acquisition and management is aimed at assuring public benefits in the form of effective stewardship of water and related natural resources. A particular property may provide flood protection, preserve water quality or even reserve a future water supply, but through public ownership, each assures an opportunity that might not otherwise be there in the future.

The District acquires lands which meet the objectives of the Water Management Lands Trust Fund through both the Save Our Rivers (SOR) program, and Preservation 2000 (P2000) program. A new program, “Florida Forever,” was passed by the Florida Legislature in 1999, and will serve as the successor to P2000, effective July 1, 2001. Examples of District-acquired lands include riverine swamps and flood conveyance corridors (particularly those downstream of flood detention areas subject to heavy development pressure), or areas adjacent to other District or public land holdings.

Additionally, lands having some unique water management function, such as special recharge areas or those essential to protect water supplies, have been purchased. Land acquisition and management programs are described more fully in the Natural Systems section, including discussion of less than fee techniques used by the District.

Part H. Program Overview

This section provides a brief standardized description of the major programs underway at the SWFWMD. Each WMD currently categorizes the program-related budget data it submits annually to the Governor’s Office, the DEP and the Legislature by six common program areas. The statewide definitions used for each program area are shown below, while Figure 9 depicts how specific District programs correlate to this format. More detailed descriptions of individual programs are included in the sections on Water Supply, Flood Protection, Water Quality, Natural Systems and Management Services, respectively.

1.0 Water Resource Planning and Monitoring

This program includes all water management planning, including water supply planning, development of minimum flows and levels, and other water resource planning; research, data collection, analysis, and monitoring; and technical assistance (including local and regional plan and program overview).

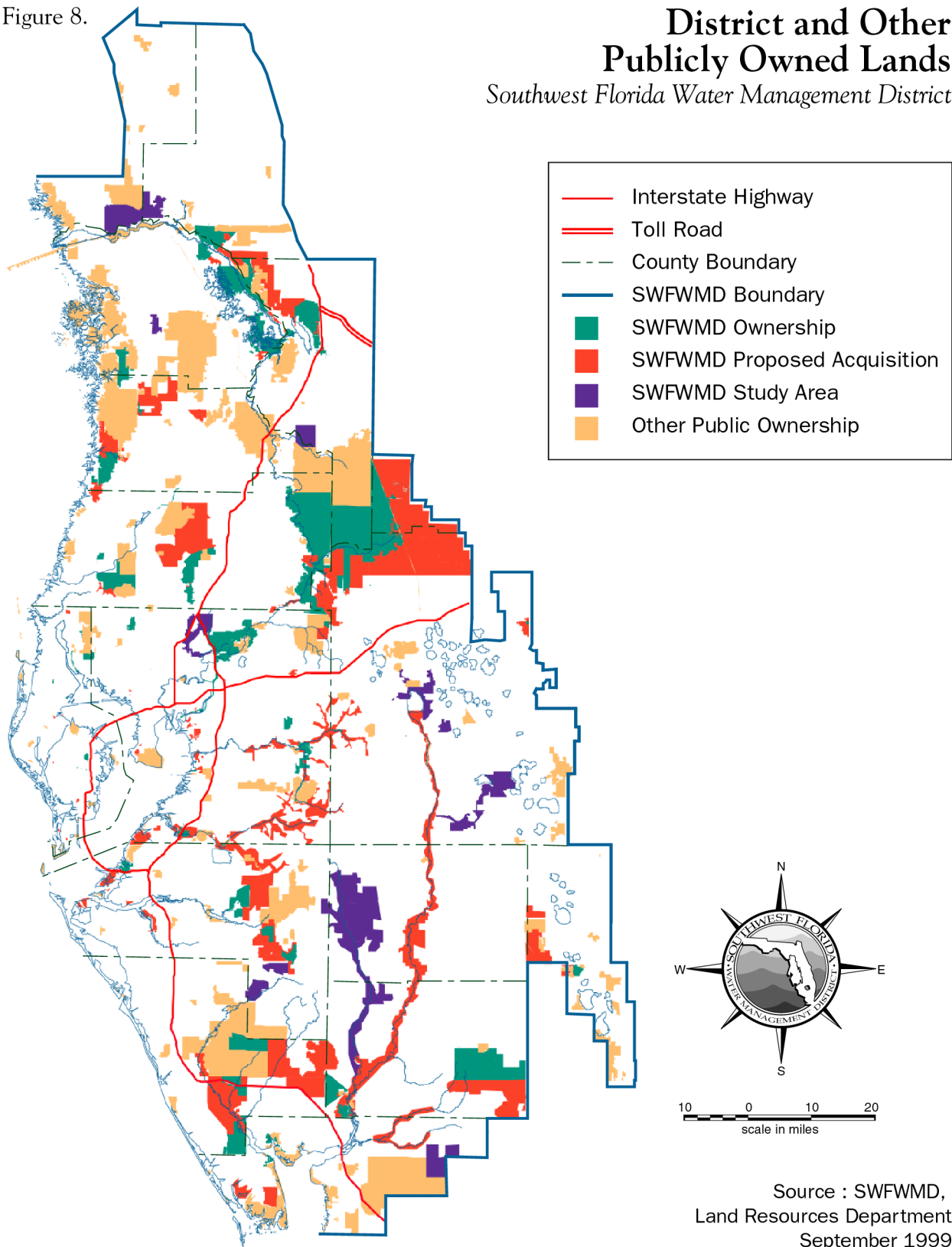
2.0 Acquisition, Restoration and Public Works

This program includes the development and construction of all capital projects (except for those contained in Program 3.0), including water resource development projects/water supply development assistance, water control projects, and support and administrative facilities construction, cooperative projects, land acquisition (including SOR/P2000), and the restoration of lands and water bodies.

Figure 8.

District and Other Publicly Owned Lands

Southwest Florida Water Management District



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Figure 9.

District Program Overview

1.0 Water Resource Planning and Monitoring

District Water Management Planning
 – Water Supply Planning
 – Minimum Flows and Levels
 – Other Water Resource Planning
 Research, Data Collection, Analysis and Monitoring
 Technical Assistance
 – Local Government Planning Assistance
 – Community Affairs
 Other

2.0 Acquisition, Restoration and Public Works

Land Acquisition
 Water Source Development
 – Water Resource Development Projects
 – Water Supply Development Assistance
 Surface Water Projects
 – Surface Water Improvement and Management (SWIM)
 – Mitigation
 Other Cooperative Projects
 Other
 – Quality of Water Improvement Program (QWIP)
 – Regional Observation Monitoring Program (ROMP)
 – Facilities Construction and Major Repair
 – Basin Initiatives

3.0 Operation and Maintenance of Lands and Works

Land Management (P2000/Save Our Rivers) Works
 – Structure, Inspection, Operation and Maintenance
 – Works of the District
 Facilities
 Invasive Plant Control
 Other

4.0 Regulation

Consumptive Use Permitting
 Water Well Construction Permitting & Contractor Licensing
 Environmental Resource & Surface Water Permitting
 Other

5.0 Outreach (Public Education)

Water Resource Education
 Public Information
 Public Relations
 Lobbying Activities
 Other

6.0 District Management and Administration

Boards & Executive Support
 Reserves (General Fund)
 Reserves (Basins)
 Commissions
 Finance
 General Counsel
 General Services
 Human Resources
 Information Resources
 Inspector General
 Risk Management
 Strategic Planning
 Ombudsman

Source: SWFWMD District Water Management Plan, March 1995 and DEP Program Reporting Categories, February 1998.

3.0 Operation and Maintenance of Lands and Works

This program includes all operation and maintenance of facilities, flood control and water supply structures, lands, and other works authorized by Chapter 373, F.S.

4.0 Regulation

This program includes water use permitting, water well construction permitting, water well contractor licensing, environmental resource and surface water management permitting, permit administration and enforcement, and any delegated regulatory program.

5.0 Outreach

This program includes all environmental education activities, such as water conservation campaigns and water resource education; public information activities; all lobbying activities relating to local, regional, state, and federal governmental affairs; and all public relations activities, including related public service announcements and advertising in any media.

6.0 District Management and Administration

This program includes all Governing and Basin Board support; Executive support; management information systems; unrestricted reserves; and general counsel, ombudsman, human resources, finance, audit, risk management, and administrative services.

Part I. Planning Units

Geographic planning units used in this Plan vary depending on the nature of the analysis being performed. In general, planning units are water resource-based, as with the watersheds of the CWM initiative, SWIM water bodies and WUCAs. In some cases, however, other approaches are utilized, as with the Integrated Plan prepared for each county in the District.

Occasionally, a hybrid of resource and programmatic functions occurs, as with the District's Basin Boards whose boundaries are generally based on surficial hydrologic conditions, but which provide funding and technical assistance to local governments within their jurisdiction, or water supply authorities that serve a regional area. Other planning units are used and described throughout this document.

It is the intent of this Plan to use those planning units that best depict the information to be conveyed, while attempting to maintain comparability whenever possible. The existence of 98 local governments, several regional planning councils and numerous quasi-governmental organizations (Metropolitan Planning organizations, special taxing districts, etc.) emphasizes the importance of the centralized, regional role the District plays for water resources, while also illustrating the difficulty of relying on limited planning units. Perhaps most important is how the District achieves intergovernmental coordination among the many players in southwest Florida. This is addressed in the Implementation Coordination section of the Plan.

Part J. Major Accomplishments and Changes Since 1994

The need to regularly evaluate the District Water Management Plan is explicitly acknowledged in the state's "Water Resource Implementation Rule" (Chapter 62-40, F.A.C.). It requires that the Plan include provisions for updating and monitoring progress every five years following initial Plan development. In addition to the five-year appraisal, an annual evaluation of the District's progress toward implementing the Plan is also required. The purpose of these "Annual Report(s)" is to provide an activity-based measure of whether the District is effectively realizing its strategies.

The District has prepared and submitted to DEP four Annual reports (1995-98) since acceptance of the original Plan by the Governing Board in 1994. These documents, available from the District upon request, clearly illustrate the progress made in implementing the Plan. They have also been made available to regional planning councils, local governments and members of the public as a means of building partnerships and evidencing the accountability of the District in managing and protecting water resources.

The latest report (District Water Management Plan 1998 Annual Progress Report, SWFWMD) documents that of 163 strategies contained in the 1994 Plan, significant accomplishment has occurred on 62, an additional 100 are in progress and one strategy was not accomplished. It is important to note that many ongoing strategies are significant parts of the District's overall management approach (e.g., recharge mapping, the CWM initiative, etc.), and are essentially meant to be "ongoing." Given all the District's responsibilities (Water Supply, Flood Protection, Water Quality and Natural Systems), over 99 percent of the strategies have been accomplished or are in progress. The only strategy not accomplished (developing a program to educate communities to the potential danger in allowing proliferation of the use of the shallow aquifer system) was a longer term one that is just beginning to evolve.

The District's planning and management activities were also strongly affected by the 1997 Legislature's passage of House Bill (HB) 715. It codified the role and basic requirements of the District Water Management Plans, while placing special emphasis on water supply planning and development. This included the requirements for the Districtwide Assessment and any subsequently needed regional water supply plans, as well as clarifying the roles of the districts and local utilities in "water resource development" and "water supply development," respectively. Further discussion of this distinction, and other

actions emanating from the legislation, can be found in the Water Supply section.

So while the reader is referred to the four annual reports for greater detail, the following brief list represents the major changes and accomplishments by area of responsibility over the intervening period since the 1994 Plan acceptance.

Water Supply

- ❖ Finalizing the Tampa Bay Partnership Agreement to restore the environment, provide a safe and sustainable water supply and end litigation.
- ❖ Highly active involvement in responding to Executive Order 96-297 and HB 715, both independently (completion of the Districtwide Water Supply Assessment, initiation of regional water supply planning, setting of minimum flows and levels for the Tampa Bay region, etc.), and as part of a coordinated statewide effort among the WMDs and DEP.
- ❖ Substantial ongoing investment in alternative water supplies through the New Water Sources Initiative (NWSI) and Cooperative Funding.
- ❖ Completion of recharge mapping in several counties with high recharge areas, including cooperative efforts with the South, Suwannee and St. Johns districts.
- ❖ Initiation of a reevaluation of the SWUCA that will lead to an overall management plan for the area that emphasizes a balance between regulatory and incentive-based approaches.

Flood Protection

- ❖ Provided technical and other assistance to local governments and property owners during El Niño related flooding in 1997-98.

- ❖ Addressed water resource issues within the Withlacoochee Basin and Lake Tsala Apopka system, including initial design of a comprehensive watershed study to be undertaken by the Army COE, and coordination with DEP's Ecosystem Management Initiative.
- ❖ Partnering with the Federal Emergency Management Agency (FEMA) in the development of enhanced floodplain information to be used in the update of Federal Insurance Rate Maps (FIRM).
- ❖ Initiated cooperative efforts with Sumter and Hernando counties to resolve flood protection issues, including floodplain mapping and/or floodplain analysis projects.
- ❖ Cooperatively funded several projects to improve stormwater conveyance within selected flood-prone areas pursuant to "flood responsibility" agreements (e.g., the Peace Creek Canal project in Polk County).

Water Quality

- ❖ Completion of ground and surface water studies in the northern District springs (Citrus, Hernando, Pasco counties), providing critical information on how and why nitrate levels are increasing.
- ❖ Participation in the completion of the Tampa Bay National Estuary Program's Comprehensive Conservation Management Plan, and signing of an historic agreement by all parties involved to systematically reduce nitrogen input to the Bay as the key component of ongoing management.
- ❖ Ongoing redesign and improvement of the water quality monitoring network in the SWUCA.

- ❖ Maintenance of the Ambient Monitoring Program which monitors 300 lakes every three years to provide a regional picture of trends in lake water quality.
- ❖ Participation in the Lake Panasoffkee Restoration Council, including completion of a coordinated strategy for the lake and updating of the SWIM Plan.
- ❖ Participation in the design and implementation of the DEP Integrated Water Resource Monitoring network (IWRM), which involves monitoring and assessment of groundwater, springs, lakes, rivers, canals and estuaries at fixed and random sites throughout the District, for assessment of temporal and spatial water quality variability.

Natural Systems

- ❖ Establishing Minimum Flows and Levels (MFLs) for the Tampa Bay region.
- ❖ Annual updating of the MFL Priority List and Schedule as statutorily required.
- ❖ Continuing progress in completing and implementing the CWM initiative for all eleven watersheds in the District (applies to all District responsibilities, not just Natural Systems).
- ❖ Strategic land acquisition to protect and manage water resources, including significant use of less than fee techniques as directed by the Legislature.
- ❖ Participated in the Greenways initiative at the state, regional and local levels to promote effective resource protection.

Chapter II. Water Management Goals and Policies

Simply stated, a goal is an end that one strives to attain, the aim toward which our efforts are directed. A regional water resource agency, just like an individual or a local government, must have a sense of direction, especially when faced with rapidly evolving and often conflicting priorities. The aspirations of such an agency, when clearly stated and actively pursued, can form the foundation for an organizational philosophy, which in turn supports equitable and consistent decisions in an ever-changing world. At the Southwest Florida Water Management District (SWFWMD or District), this foundation includes our vision, mission and goals.

This section contains the regional water management vision, mission and goals which establish direction for programs and activities that address the water resource issues identified in the District Water Management Plan (Plan). Goals are provided for the five main areas of responsibility of the District: water supply, flood protection, water quality management, natural systems management and management services. This takes into account not only previously developed goals and policies of the SWFWMD, but the relevant policies and goals contained in the State Comprehensive Plan, and the responsibilities and authority directed to the District in Chapter 373, Florida Statutes (F.S.), and the State Water Resource Implementation Rule, Chapter 62-40, Florida Administrative Code (F.A.C.).

This section does not include policies, since these can be found in the respective area of responsibility chapters. The final portion of this chapter includes an overall summary of the performance-based program budget measures that have been jointly developed by the districts, the Executive Office of the Governor (EOG) and the Department of Environmental Protection (DEP).

Part A. Vision and Mission Statement

The following vision statement reflects the **preferred** conditions fifty years into the future in terms of both the water resource and the agency. The purpose of the vision is to show where we want to go – in effect, a picture of a successful future for water management and protection. It has another significant use: it will serve as an informal guidance tool for future decision making (i.e., are actions contemplated consistent with where we want to end up?).

Everyone in the District has a role in realizing the vision. Once effectively communicated, all parties can do their part to move us toward our preferred future. This vision will be revisited periodically to assure it remains appropriate.

Vision - The Resource

There is an ample supply of clean water for all appropriate users, including the environment. This is a result of several factors, including interconnection of major water utilities, a widespread conservation ethic, careful management and protection by the District, and technological advances that have lessened human needs for fresh water. Primary among these advances is the ability to make efficient use of alternative sources, including reuse and seawater. In short, sustainable resource use, or "safe yield," has been achieved.

Floodplains are serving their natural functions due to the evolution of "enviro-urban habitats" where development reflects a balance between humans and nature. The combination of strategic District land acquisitions, consistent application of local government land use and zoning powers and futuristic development techniques have resulted in preservation of key flood-prone areas for natural attenuation **and** responsible redevelopment that prevents major damage during even large scale storm events. An effective partnership of the District, local, regional and state governments is involved in disaster prediction, response and recovery.

Water quality in Tampa Bay and other water bodies has been restored, including use for swimming, and the fishing industry has made a strong recovery. A comprehensive resource data network is in place, allowing continual real-time monitoring of water quality throughout the District. Strong water quality management has assured viable ecosystems, and the District's focus is now on maintenance and restoration of such systems. Mitigation banking has resulted in a net gain in viable wetlands. Protection of ecosystems is further advanced by well-managed public lands. Many are connected to each other, and to population centers, by greenways that serve as conduits for human and wildlife access.

Overall, an effective balancing of the District's resource-based responsibilities has been achieved. State, regional and local governments have worked closely with the District to define and realize sustainable limits based on the carrying capacity of southwest Florida's natural resources.

Vision - The Agency

The concept for the SWFWMD of the future can be stated in a phrase: positive action on behalf of water resources. The District has become the recognized agency for information on the environment. Monitoring networks have been completed, a continuing emphasis on research and funding for water management solutions has evolved and viable incentives for resource protection are in place. Our function is less regulatory and more that of a facilitator and technical expert, allowing the agency to exert global influence in water management. We make use of advanced, interactive technologies, including real-time telemonitoring of all systems.

Water resources education continues to play an important role in new attitudes, including a strong conservation ethic and support of a "design with nature" approach to water resources. The District has achieved outstanding coordination with local governments, including a solid linkage between land and water planning. With "safe yield" established and implemented, the District serves as a mediator in water use between local governments, agriculture and others. The District has also proved to be a powerful force in consensus building, including interactions with other water management districts (WMDs), State agencies and the legislature.

The District is recognized as an innovator in public management. Its positive public image is a result of cost-effective services and public awareness of its role and accomplishments. Its commitment to excellence is reflected in a diverse, highly skilled work force that receives regular training aimed at their continuous development. The net result for west-central Florida is an enhanced quality of life.

Mission Statement

The Governing Board of the Southwest Florida Water Management District has adopted a formal Mission Statement, as follows:

The mission of the Southwest Florida Water Management District (District) is to manage water and related natural resources to ensure their continued availability while maximizing environmental, economic and recreational benefits. Central to the mission is maintaining the balance between the water needs of current and future users while protecting and maintaining water and related natural resources which provide the District with its existing and future water supply.

The Governing Board of the District assumes its responsibilities as authorized in Chapter 373 and other chapters of the Florida Statutes by directing a wide-range of programs, initiatives, and actions. These include, but are not limited to, flood protection, water use, well construction and environmental resource permitting, water conservation, education, land acquisition, water resource and supply development and supportive data collection and analysis efforts.

Part B. Goals

Water Supply - Ensure an adequate supply of the water resource for all existing and future reasonable and beneficial uses, while protecting and maintaining water resources and related natural systems.

Flood Protection - Minimize the potential for damage from floods by protecting and restoring the natural water storage and conveyance functions of flood prone areas, giving preference wherever possible to non-structural surface water management methods.

Water Quality - Protect water quality by preventing further degradation of the water resource and enhancing water quality where appropriate.

Natural Systems - Preserve, protect and restore natural systems in order to support their natural hydrologic and ecologic functions.

Management Services - Ensure management support services seek continuous improvement while effectively and efficiently providing the resources and assistance necessary to achieve the District's mission to manage and protect water and related resources.

Part C. Water Management Performance Measures

Ultimately, the success of the District's resource management efforts come down to how well we have performed in improving the condition of water and related natural resources.

Historically, it has been difficult to measure performance in environmental management for a variety of reasons. For example, isolating the results of a given action by the District is problematic when we consider the many other forces at work, from land use decisions to climatic changes. Similarly, the use of differing measures (e.g., biologic measures versus chemical measures for water quality) can yield conflicting results.

Whatever the challenges, the water management districts in conjunction with DEP and the EOG have developed a set of “core” performance measures that will be used to assess the districts’ performance relative to their annual budgets. These measures are listed here to illustrate just one of the accountability devices we can apply to verify our success and guide needed adjustments. The measures specific to each of our responsibilities have also been included in the respective chapters on Water Supply, Flood Protection, Water Quality and Natural Systems.

The District may add to the core list below any other measures appropriate for its own programs and needs (see Management Services section). It is recognized that the new Florida Forever Act and other developments will necessitate further changes and refinements in these measures.

Section 1. Measure Common to All Four Areas of Responsibility

Acres in managed conservation areas owned by the District.

Section 2. Water Supply Measures

Objective 1: Increase available water supplies and maximize overall water-use efficiency to meet identified existing and future needs.

- a. 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, and
 1. Percent of estimated amount of water actually made available.
 2. Percent of estimated amount under development.
- b. Within each water supply planning region, the estimated additional quantities of water supply made available through District water supply development assistance.

- c. Percentage of domestic wastewater reuse (reuse capacity and flow).
- d. Gross per capita public supply water use by water supply planning regions, county, and District.

Objective 2: Prevent contamination of water supply sources.

- a. Percentage of surface water supply sources for which water quality fully attains the designated use.

Section 3. Flood Protection and Floodplain Management Measures

Objective 1: Minimize flood-related damage.

Objective 2: Promote non-structural approaches to achieve flood protection and to protect and restore the natural features and functions of the 100-year floodplain.

- a. Acres identified for acquisition to minimize damage from flooding and the percentage of those acres acquired.

Section 4. Water Quality Measures

Objective 1: Protect and improve surface water quality.

- a. Percentage of water segments that fully meet, partially meet, and do not meet their designated uses as reported in the DEP State Water Quality Assessment (the 305(b) Report).
- b. Number and percentage of water bodies with approved Surface Water Improvement and Management (SWIM) plans for which Pollutant Load Reduction Goals (PLRGs) have been established.
- c. Percentage of total stream miles and lake and estuary area in the District assessed for ambient water quality.

Objective 2: Protect and improve groundwater quality.

- a. Improving, degrading and stable trends in groundwater quality, as reported in the DEP State Water Quality Assessment (the 305(b) Report).
- b. Improving, degrading and stable trends in nitrate concentrations in springs, as reported in the DEP State Water Quality Assessment (the 305(b) Report).

Section 5. Natural Systems Measures

Objective 1: Maintain the integrity and functions of water resources and related natural systems.

- a. Number of Minimum Flows and Levels (MFLs), by water body type, established annually and cumulatively.
- b. Number and percentage of established MFLs being maintained.
- c. Number and percentage of water bodies not meeting MFLs upon establishment which have:
 1. fully recovered, or
 2. partially recovered.
- d. Total acres of wetlands or other surface waters authorized by environmental resource permit to be impacted and acres required to be created, enhanced, restored and preserved.

Objective 2: Restore degraded water resources and related natural systems to a naturally functioning condition.

- a. Acres of District-owned lands in the land management plans identified as needing restoration; acres undergoing restoration; acres with restoration activities completed.
 - b. Acres of invasive nonnative aquatic plants in inventoried public waters.
 - c. Acres of District-owned land infested with invasive nonnative upland plants, by species inventoried.
-

Chapter III. Water Management Responsibilities

This section of the District Water Management Plan (Plan) assesses the Southwest Florida Water Management District's (SWFWMD or District) duties for four resource-based "Areas of Responsibility" (AORs): water supply, flood protection, water quality and natural systems. These are the categories agreed upon by all five water management districts and the Department of Environmental Protection (DEP) as representative of our collective water management responsibilities. This coordinated format is intended to establish a consistent planning approach and clearer understanding of our respective duties. A fifth AOR has also been identified and assessed by the southwest District: management services. This covers the administrative functions of the agency in recognition of the important contributions they make to effective and efficient delivery of regional water resource services.

Each area of responsibility is addressed through a four-step planning process:

1. Resource Assessment,
2. Issue Identification,
3. Water Management Policies, and
4. Implementation Strategy.

Preparation and updating of this Plan began with a series of workshops with District staff teams for each area of responsibility, comprised of individuals from various disciplines and departments. These teams identified water resource management issues that present the District with opportunities for potential improvement. These issues were reviewed with Executive staff, the Governing Board, the Basin Boards, and with representatives of local governments and the public through a series of public workshops held throughout the District. Strategies have been developed to address each of the issues identified.

This process allows a comprehensive assessment of current conditions, identification of key resource issues, and careful deliberation of alternative policies and strategies to effectively manage and protect water and related natural resources.

Many of the programs and projects currently being implemented by the District, as well as future strategies proposed to address identified resource management issues, contribute toward multiple AORs. Land acquisition, for instance, can play a significant role in assuring water supplies, flood protection, water quality and natural system viability. In order to minimize duplicative descriptions of these existing or proposed strategies, each of these multi-AOR strategies is described within the AOR chapter of most direct application (i.e., if the strategy did not contribute toward accomplishing the particular AOR it would not be undertaken regardless of its benefits within other AORs). In most cases, program descriptions are kept brief, with more detailed information available upon request.

Part A. Issues Common to All Areas of Responsibility

There are a number of water resource management issues and strategies that are common to all the District's AORs (i.e., water supply, flood protection, water quality and natural systems). These issues illustrate the interconnectedness of water and related natural resources, as well as the comprehensive approach that must be utilized in effective management. In order to avoid duplicative descriptions and references, these issues and strategies that relate to all AORs have been consolidated in this section.

Section 1. Issue Descriptions

Issues common to the District's four areas of responsibility include:

1. Comprehensive Watershed Management Initiative
2. Linking Water Management and Land Use Planning
3. Collection, Coordination and Distribution of Technical Information
4. Compliance and Enforcement of Regulations
5. Public Communication and Outreach

1-1 Comprehensive Watershed Management Initiative

There is a growing recognition at the local, regional, state and federal level of the need for "place-based" strategies that address entire ecosystems in an integrated fashion, including water quality, flood protection, natural system protection, water supply protection, and surface and groundwater interactions. Such an initiative is well underway at the District and is referred to as the Comprehensive Watershed Management (CWM) initiative.

The CWM initiative is designed to allow for careful evaluation of the regional status of water resources, with analysis organized by the District's four AORs: water supply, flood protection, water quality, and natural systems. Multi-disciplinary and multi-agency teams have been convened to develop and implement watershed management plans and implementation activities within each of the District's eleven watersheds. The CWM plans are intended to help ensure that comprehensive, coordinated analysis and decision-making take place. The plans foster closer cooperation among the District, local governments, and other stakeholders to help preserve the qualities of watersheds as growth and development take place in the future. Although well under way, the real work of implementing the CWM initiative in an integrated and coordinated fashion is still before us. For a more in-depth discussion of the CWM initiative, see the Watershed Management section of this Plan.

1-2 Linking Water Management and Land-Use Planning

The water management activities of the District and the land-use planning and management activities of local governments must be coordinated in order for either to be effective and efficient in accomplishing their respective objectives. The land-use decisions of local governments, such as where growth is to occur and the type and density of land use, can have a variety of water management ramifications. Examples of such potential ramifications include growth in water demands, floodplain encroachment and water quality degradation. Similarly, the water management efforts of the District, such as identification of sources to meet future water demands, can have implications for local government land-use planning. Since local governments have exclusive authority over land-use decisions, it is important that their planning and actions be closely tied to the carrying capacity of natural resources such as water, and the agencies that manage them. Examples of positive local actions include implementation of

wellhead protection programs, acquisition of environmentally sensitive lands and use of land use, zoning and site development regulations for resource protection. The District must continue to coordinate with local governments, providing “best available information” and ultimately collaborating with such entities to develop a mechanism that integrates local land use planning and water resource planning and permitting.

1-3 Collection, Coordination and Distribution of Technical Information

The District is constantly attempting to improve its understanding of the hydrologic system and human influences upon this system. This is particularly true for the groundwater system, which provides over 80 percent of the water supply in the District, and how it interacts with surface waters. However, the District does not have the luxury of waiting until it has all the desirable information and technical capabilities to make informed, rational resource management decisions. Rather, the District is required by statute to make current decisions based upon the **best available information**. Local governments and others rely on the District as a source of such information for their short- and long-range planning and implementation activities.

In each of the District’s key responsibilities, specific technical information needs have been identified:

Water Supply - Water Resource Assessment Projects (WRAPs) and other management activities have surfaced the need for additional data collection for better delineation of the fresh/salt water interface; groundwater levels; hydrogeologic information (particularly regarding the intermediate aquifer system in the southern part of the District); and water use (including future projections).

Flood Protection - The District collects and stores tremendous amounts of data in various forms, from written records to computerized databases, including the Geographic Information System (GIS). The sharing of this data with other agencies, regional planning councils and local governments is often hampered by differences in format, quality standards, and computer hardware and software compatibility.

Water Quality - Coordination of existing monitoring efforts for surface and ground water within and outside the District will enhance the current data collection activities of all parties and help identify background information to remediate impacted water bodies and preserve pristine ones. Because a number of agencies are involved with water quality, a better integration of the District's and other agencies' roles and responsibilities regarding water quality issues is imperative for effective results.

Natural Systems - Managing the environmental effects of water use relies on information regarding the hydrologic requirements of natural systems associated with lakes, streams, wetlands and estuaries. The District must continue its research, and support the research of others, concerning the hydrologic requirements of natural systems and practical methods of accounting for these requirements in water management decisions.

1-4 Compliance and Enforcement of Regulations

In order for the District's rules and regulations to effectively accomplish the objectives for which they were established, compliance with these rules and regulations must be ensured. The District must have a means by which to monitor compliance, and enforcement initiatives must be reviewed and updated as necessary. Should the District's rules and regulations become increasingly restrictive due to particular resource needs in an area (e.g., Water Use Permitting (WUP) rules in the Water Use Caution Areas

(WUCAs)), the incentive for violations can increase, along with the potential for harm to the water resource caused by such violations.

Chapter 373, Florida Statutes (F.S.), authorizes the District to establish and maintain compliance and enforcement activities. Compliance and enforcement is a continuing issue with all District rules and regulations, including water use, surface water, well construction permitting, water shortage restrictions and the year-round water conservation measures. Improvements have occurred in recent years in all compliance and enforcement activities, but the need exists to examine the overall enforcement program to set the priorities (e.g., added emphasis on water use and well construction compliance), and to implement the changes needed to improve the program.

1-5 Public Communication and Outreach

Water resources education is an essential part of each of the District's AORs. It is a goal of the District to provide all citizens, local governments, visitors, and organized interest groups within the 16-county area with information about its current activities and future plans, thereby increasing the public's awareness of their connection to, their dependence on, and their responsibility to participate in the protection of Florida's water resources.

While this applies to all our responsibilities, an example from Natural Systems is illustrative. The District must continue to plan and implement appropriate public outreach programs that support the protection of natural systems. The District, like much of the state, has a highly transient population. The majority of residents are new to the area. Newcomers, as well as many long-term residents, often have little understanding of the fragility and importance of our natural systems and associated water

resources. For this reason, public education must play a strong, long-term role in all water management efforts. Such efforts should range from awareness of public recreational access to District lands to individual stewardship for water and related natural resources, focusing on both resident and seasonal populations.

Section 2. Policies

The following policies provide long-range guidance to the District in fulfilling its statutorily-based management responsibilities. These policies express the position or strategy of the District which will be applied consistently in response to various resource management issues. In this case, "District" refers to the Governing Board and Basin Boards, since both make funding and other decisions in the best interest of the resource.

These policies may be implemented only to the extent that financial, staff or other necessary resources are available, pursuant to the budgetary actions of the Governing Board and Basin Boards. These policies do not create any regulatory authority and may require rule making as one component of their implementation. The policies contained within the Plan shall be reasonably applied where they are environmentally, technically and economically feasible. These policies shall be construed and applied as a whole, in recognition of the policies within all areas of responsibility within the Plan, and no specific policy shall be construed or applied in isolation from the other policies in the Plan. The reader is referred to each of the separate AOR chapters for policies specific to Water Supply, Flood Protection, Water Quality and Natural Systems, while those noted below have general applicability to the five common issues described above.

2-1 Comprehensive Watershed Management Initiative

The policies contained throughout each of the four resource-based AORs (e.g., water supply, flood protection, water quality and natural systems) are all pertinent to the CWM initiative.

2-2 Linking Water Management and Land Use Planning

It is the policy of the District to:

1. Coordinate with other water management districts (WMD), regional planning councils (RPCs), local governments, the Department of Community Affairs (DCA) and other appropriate State agencies to assure linkage of water and land use planning and management.
2. Coordinate with the RPCs to ensure a consistent approach to proposed water use, surface water management, and water quality/stormwater protection in appropriate elements of the Strategic Regional Policy Plans.
3. Coordinate with local governments to seek compatibility between Local Government Comprehensive Plans and land-use decisions, and District plans, programs and rules.
4. Promote agreements and programs with other agencies to provide coordinated and consistent planning for management of watersheds.
5. Ensure that District activities recognize and work with the local processes and plans of the area in which they are undertaken.
6. Emphasize preservation, maintenance and protection of ecologically intact systems in all land and water planning, management, and regulatory activities.
7. Participate with other agencies in the siting of locally unpopular land uses.

8. Coordinate with other agencies to reduce proposed transportation project impacts on ground and surface water and associated natural systems.
9. Seek to achieve consistency between District plans, programs and rules with the State Comprehensive Plan, and the Florida Water Plan (including the State Water Resource Implementation Rule, Chapter 62-40, Florida Administrative Code (F.A.C.)).
10. Identify mutual water management issues between water management districts with shared boundaries to coordinate necessary actions.
11. Promote consistency between local, regional, state, and federal legislation and implementing regulations to ensure consistent protection of water resources and related natural systems.
12. Consider existing federal, state, regional and local plans pertaining to environmental protection prior to the initiation of activities that impact water and land resources.
13. Coordinate with other agencies to encourage the combined siting of facilities requiring corridors, such as roads, pipelines, and power lines, in order to minimize the impact such activities have on natural systems.

2-3 Collection, Coordination and Distribution of Technical Information

It is the policy of the District to:

1. Conduct or sponsor research for innovative and cost-effective means to protect, maintain and where necessary, restore the quality and quantity of waters and natural systems in the District.
2. Conduct research and special studies to:
 - improve nonstructural methods of flood control;

- establish effective stormwater and non-point source performance standards;
 - establish effective design, construction, and operation and maintenance practices; and
 - identify the role of water costs and other price incentives in achieving effective conservation.
3. Develop, maintain, integrate and coordinate water quality, quantity and natural system databases to ensure the ready availability of accurate data and technical information on which to base decisions, and for easy access to the data for District staff, other agencies, local governments, citizens and the media.
 4. Maintain an accurate data base on essential parameters which are important to proper management of water resources.

2-4 Compliance and Enforcement of Regulations

It is the policy of the District to:

1. Maintain adequate compliance and enforcement programs to continue to ensure effective resource protection.
2. Where it can be demonstrated to be effective, delegate the District's environmental resource permitting program, including compliance and enforcement, to local governments in accordance with District and DEP rules.
3. Ensure adequate resources are dedicated to implementation of District regulatory programs, including compliance and enforcement.
4. Optimize the benefits of mitigation, including consideration of large-scale mitigation banking.
5. Provide compliance incentives to complement District regulatory initiatives.
6. Coordinate with other regulatory agencies, including local governments, to establish integrated regulatory and permitting programs.

2-5 Communications' and Outreach

It is the policy of the District to:

1. Provide an on-going message of who we are, what we do and how we protect the public resource.
2. Coordinate with other agencies, local governments, water user groups, and the general public in the formulation and pursuit of water management goals and objectives.
3. Provide technical assistance, as necessary, to assist local governments and others undertaking the protection and development of water resources.
4. Include, to the extent practical, all users affected by District decisions in decision-making processes.
5. Establish, maintain, and effectively use standing advisory committees that represent the major water use sectors in the District or other interest groups, including, but not limited to, the Public Supply, Green Industry, Environmental, Agricultural, Industrial and Well Drillers advisory committees.
6. Periodically, measure public awareness of water resource issues and management programs as a means of identifying any need for specific awareness efforts.
7. Provide public education at the Districtwide and Basin levels on the effects of individual actions on water and water-related resources.
8. Seek to ensure the provision of educational programs for the general public, school children, college and university students, and teachers on issues related to water and related land-resources management, and District priority issues.
9. Educate the public on the requirements and authority for the District's regulatory initiatives.

10. Maintain an aggressive public information/education program for conservation and demand management practices to increase awareness of the role individuals can play, to motivate citizens and organizations to conserve, and to change attitudes and behavior with regard to water use.
11. Practice water conservation, and other good water management practices, at all District-owned facilities and properties as a model for implementation by both the public and private sector.
12. Provide opportunities for cooperative education efforts with local governments, the business and environmental communities and others.

Section 3. Strategies

Implementation strategies are the means through which the District responds to identified issues to improve water resource management. They are the synthesis of all our planning. Within this section, implementation strategies are described for all of the District's common issues previously identified. The format includes, as appropriate, tasks, schedules and identification of responsible entities. It is important to remember that many of the District's existing programs serve as the foundation for responsive strategies, e.g., the CWM Initiative as it relates to achieving coordinated watershed management.

3-1 Comprehensive Watershed Management Strategy

Task 1: Continue the CWM initiative process at the District, including active involvement by local governments, state agencies and other interested parties.

Responsible Entity: CWM teams, including various District departments; local governments; DEP; other interested parties.

Task 2: Complete all CWM plans by December, 2000.

Responsible Entity: CWM teams, including various District departments; local governments; DEP; other interested parties.

Task 3: Continue to work closely with special purpose entities to achieve watershed management on a continuous basis, including, but not limited to:

- Hillsborough River Greenways Task Force
- Green Swamp Task Force
- Hillsborough County Environmental Protection Commission (EPC)
- Hillsborough River Interlocal Planning Board
- Charlotte Harbor, Sarasota Bay and Tampa Bay Estuary programs (NEPs)
- Lake Panasoffkee Restoration Council
- Citizen interest groups (e.g., Alafia River Basin Stewardship Council, TOO FAR, etc.)

Responsible Entity: CWM teams, including various District departments; entities noted above; and other interested parties.

Task 4: Continue to enhance the District's GIS capabilities and analytical support to the CWM initiative. Utilize this technology to analyze and influence future conditions within each watershed.

Responsible Entity: Resource Data and Planning departments.

Task 5: Utilize the Basin Board Cooperative Funding program on an annual basis to implement solutions identified by CWM teams and approved by Executive.

Responsible Entity: Basin boards; CWM teams.

NOTE: See the Watershed Management section for additional elements of this strategy.

3-2 Linking Water Management and Land Use Planning

Task 1: Maintain the District's proactive Local Government Planning Assistance program on a continuous basis, including thorough review of Evaluation and Appraisal reports and plan updates for all District counties and municipalities.

Responsible Entity: District Planning, Communications and Community Affairs departments; local governments; RPCs.

Task 2: Implement results of "Linking Land and Water Management in Northwest Hillsborough County," and "Levy County Water Plan" projects.

Responsible Entity: Southwest and Suwannee WMDs; Hillsborough County; Levy County.

Task 3: Actively support such information sharing efforts as "WaterSmart Communities, Tools for Decision Makers" (an awareness program for local elected officials) to assist local governments in making critical decisions related to water supply, surface water management and flood protection.

Responsible Entity: WMDs; local governments.

Task 4: Continue to cooperatively fund appropriate land and water linkage studies and projects through the District Basin boards.

Responsible Entity: Basin boards; District departments; local cooperators.

Task 5: Actively coordinate with local governments in developing and completing integrated plans for 16 counties within the District within one year of Governing Board acceptance of the final plan, including coordination with adjacent WMDs.

Responsible Entity: District Planning Department; other WMDs; local governments; RPCs.

Task 6: Complete eleven CWM plans by December 2000; and maintain progress in the CWM process, including the participation of local governments, state agencies and other interested parties.

Responsible Entity: CWM teams, including various District departments; local governments; DEP; other interested parties.

Task 7: Maintain statewide coordination with DEP, the DCA, the Department of Agriculture and Consumer Services (DACS) and the other districts on land and water linkage through various forums to identify and implement new and innovative approaches.

Responsible Entity: WMDs; DEP; DCA; DACS.

Task 8: Continue to support the evolution of "Greenways" throughout the District through coordination with local governments and special-purpose entities.

Responsible Entity: District Land Resources, Planning, Communications and Community Affairs, other departments; local governments; other entities.

Task 9: Continue progress in joint land acquisition and management with local governments and state agencies.

Responsible Entity: District Land Resources Department; local governments; DEP and other State agencies.

Task 10: Coordinate with local governments in developing and implementing Flood Protection agreements for all 16 counties in the District by 2004.

Responsible Entity: District Resource Management, Planning and other departments; local governments.

3-3 Collection, Coordination And Distribution of Technical Information

Task 1: Utilize the Regional Observation and Monitoring Program (ROMP) and Quality of Water Improvement Program (QWIP) efforts on an ongoing basis to enhance delineation of the saltwater interface, groundwater levels data and related hydrogeologic information.

Responsible Entity: District Resource Data Department.

Task 2: Complete Water Use Permit Water Quality Network redesign and implement its findings by September 30, 2000.

Responsible Entity: District Resource Data Department; water use permittees.

Task 3: Commence CWM-related water quality monitoring efforts Districtwide by June 2000 in support of the development of Total Maximum Daily Loads (TMDLs).

Responsible Entity: CWM teams; District Resource Data Department, DEP; others.

Task 4: Participate in DEP's water quality data collection and analysis work (e.g., Integrated Water Resource Monitoring (IWRM) network) on an ongoing basis as part of a comprehensive water quality monitoring effort for various agencies.

Responsible Entity: DEP; District Resource Data Department.

Task 5: Continue coordinated stormwater management research with state universities, the other districts, DEP and others, including the biennial Stormwater Management Conference.

Responsible Entity: State universities; districts; DEP; various District departments.

Task 6: Complete the WRAP for the Southern Water Use Caution Area (SWUCA) by 2005 and the northern District by 2010 to enhance knowledge on water resources availability for natural systems and human needs.

Responsible Entity: District Resource Conservation and Development Department.

Task 7: Continue the annual use of cooperative funding through the Basin Boards as a means of supporting data collection, coordination and distribution, including but not limited to such efforts as LakeWatch, stormwater best management practices (BMPs) and stormwater management master planning.

Responsible Entity: Basin Boards; local governments; various District departments.

Task 8: Maintain and make widely available GIS data and aerial mapping products to governmental agencies, private firms and citizens.

Responsible Entity: District Resource Data, Planning, Communications and Community Affairs departments.

3-4 Compliance and Enforcement of Regulations

Task 1: Participate in the State's efforts to implement One-Stop Permitting consistent with legislative direction.

Responsible Entity: District Regulatory, Information Resources departments.

Task 2: Develop appropriate incentives for water use and other permitting programs to promote compliance with District rules, including but not limited to those for the SWUCA, by December 2001.

Responsible Entity: SWUCA Working Group; District Regulatory, Planning, Executive departments.

Task 3: Complete overall assessment of all District compliance and enforcement activities in order to establish priorities and strategies for any needed changes to regulatory programs by October 1, 2000.

Responsible Entity: District Regulatory and General Counsel departments.

Task 4: Enhance coordination with local governments by exploring opportunities to provide equivalent or superior environmental protection in water supply, flood protection, water quality and natural systems regulatory programs, while eliminating duplication of effort.

Responsible Entity: District Regulatory and General Counsel departments; local governments.

Task 5: Work closely with local governments and adjacent WMDs on an ongoing basis to assure compliance with water shortage plans and year-round conservation measures.

Responsible Entity: District Regulatory, Data and Communications and Community Affairs departments; local governments; St. Johns River Water Management District (SJRWMD); Suwannee River Water Management District (SRWMD); South Florida Water Management District (SFWMD).

3-5 Public Communication and Outreach

Task 1: Continue Basin Board initiatives for water resources education throughout the District.

Responsible Entity: Basin Boards; District Communications and Community Affairs Department.

Task 2: Maintain and enhance statewide coordination with DEP, the other WMDs and other appropriate parties in communicating the need for water conservation and stewardship.

Responsible Entity: District Communications and Community Affairs Department; DEP; SJRWMD; SRWMD; SFWMD; other appropriate parties.

Task 3: Update all county integrated plans, in collaboration with local governments and other interested parties, by November 1, 2000.

Responsible Entity: District Planning Department; other WMDs; local governments.

Task 4: Maintain and enhance the District's In-School Education Program as a means of changing behaviors and attitudes toward water resources among future citizens of the District.

Responsible Entity: District Communications and Community Affairs Department.

Part B. Water Supply

This Water Supply element is comprised of two aspects: (1) Needs and Sources and (2) Source Protection. Needs and Sources encompasses issues and strategies associated with current and future water demands and the identification and development of sources to meet these demands. Source Protection encompasses efforts to protect and sustain existing and future water sources. This section also describes those geographic areas where the District has determined that water supply problems either are critical, or are expected to become critical within the next twenty years (also see [District Overview](#), Sections D. and E.), and the strategies developed to address such problems.

Water Supply Goal: To ensure an adequate supply of the water resource for all existing and future reasonable uses, while protecting and maintaining water resources and related natural systems.

Section 1. Resource Assessment

Approximately 80 percent of the water used in the District is withdrawn from groundwater sources. Most of this groundwater comes from the Floridan aquifer, a thick sequence of porous limestone considered one of the world's most productive aquifers. In southern parts of the District and near the coast, the water in the Floridan is highly mineralized and is unsuitable for potable and certain other uses without expensive treatment. The surficial and intermediate aquifers are important (although not as prolific) water supply sources overlying the Floridan in some of these areas. Groundwater supplies are replenished directly and indirectly by rainfall.

Management of water supplies has been a responsibility of the District since the mid- to late 1960s when it first became involved in the regulation of withdrawals from public supply

wellfields serving the Tampa Bay area. These responsibilities were significantly expanded in the 1970s with the passage of the Water Resources Act and the initiation of the District's Water Use Permitting (WUP) program. Since that time, water supply management has grown and been legislatively refined to become one of the District's most significant areas of responsibility. Described below are the various resource management initiatives aimed at effective water supply management – issues that continue to challenge the District and Water Supply policies and strategies.

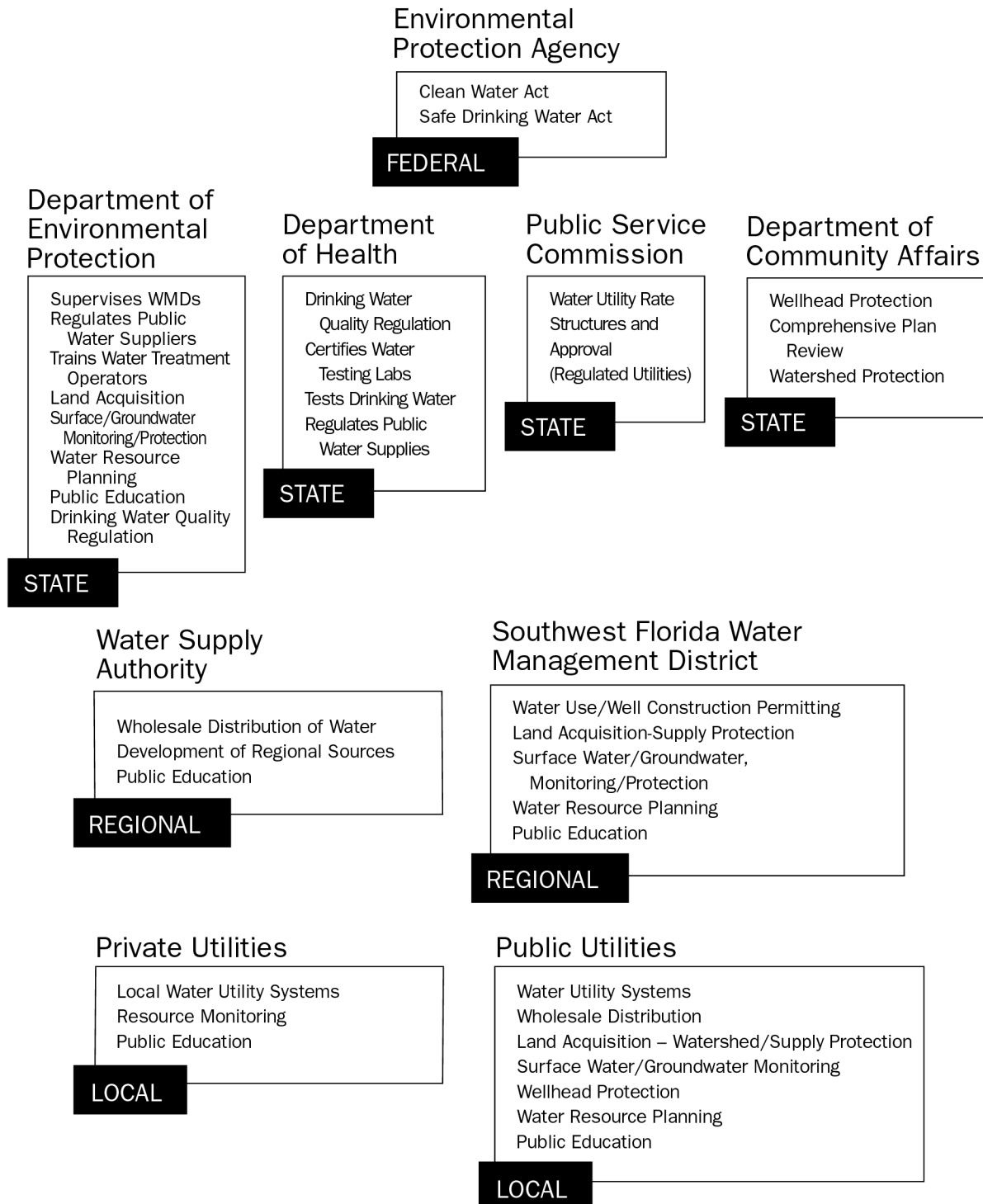
1-1 Current Programs

Current programs of the District are designed to assess the availability of ground and surface waters, as well as meeting the current and future demands for these resources. Water Supply programs must ensure reasonable and beneficial water uses that are in the public interest, and that protect existing legal users as well as the water resource and related natural environment.

Other agencies share with the District the responsibility for managing water supplies. Local governments and utilities (both public and private), regional water supply authorities, state and federal agencies all play important roles in the management and protection of our water supply resources (see Figure 10). The District's water supply management initiatives are conducted in concert with these other functions.

Figure 10.

Agencies Responsible for Water Supply in Southwest Florida



Source: SWFWMD, Planning Department December 1999

1-1.1 Needs and Sources Programs

1. Hydrologic Conditions Monitoring

The District has a comprehensive hydrologic conditions monitoring program. This program includes data collected by District personnel and permittees, as well as data collected as part of the District's cooperative program with the United States Geological Survey (USGS). Data collected from this program allows the District to gauge changes in the health of the water resource, monitor trends in conditions, identify and analyze existing or potential resource problems, and develop programs to correct existing problems and prevent future problems from occurring. The primary hydrologic conditions that are monitored include rainfall, evapotranspiration, lake levels, discharge and stage height of major streams, groundwater levels, various water quality parameters of both surface and ground water (including springs), and water use. In addition, the District monitors ecological conditions as they relate to both potential water use impacts and changes in hydrologic conditions. The District also monitors data submitted by water use permit holders to ensure compliance with permit conditions and to assist in monitoring hydrologic conditions.

2. Water Use Permitting

The primary existing regulatory program at the District dealing with water supply management is the WUP Program contained in Rule 40D-2, F.A.C. The District's WUP Program was initiated in the 1970s in response to passage of the Water Resources Act, which gave the water management districts exclusive authority to regulate water uses within the State (the SWFWMD had been involved in regulating well fields since the 1960s). The program was first initiated more as an accounting tool than a regulatory program – to determine the quantities of water being used. It is interesting to note that approximately 80 percent of today's total water

use existed at the time the District initiated the WUP Program.

The WUP Program has grown from this limited function to become one of the District's primary resource management tools. All significant water uses within the District are now regulated by this rule. The WUP rule underwent its first major revision in 1989 to address cumulative and on-site impacts, minimum flows and levels, impacts to known sources of groundwater contamination, and monitoring of water use. The rule was modified again in the early 1990s to add criteria for permitting within WUCAs (see below).

All significant water uses are regulated by the District's WUP Program. Typical thresholds that require a permit include proposed uses that:

- are equal to or greater than 100,000 gallons per day (gpd) on an average annual basis;
- have a proposed maximum daily quantity of one million gpd or greater;
- have facilities capable of pumping these quantities;
- include wells which have an outside diameter of six inches or greater; or
- encompass surface water withdrawals that have a cumulative withdrawal capacity of four inches or greater, among other thresholds.

In addition, the District can require a permit for uses that do not meet or exceed these thresholds if it anticipates that such uses will cause significant harm to the water resource or to the related natural environment, such as groundwater withdrawals in coastal areas which might cause saltwater intrusion.

There are three overall tests which are applied in the WUP Program. All proposed uses must (1) be reasonable - beneficial, (2) be consistent with the public interest, and (3) not interfere with existing legal uses. Under the first of these tests, the District examines the purpose of the proposed use, including the efficiency of water

use. It is under this reasonable - beneficial test that such criteria as agricultural irrigation efficiency requirements, per capita limits for public supply and conservation requirements, among others, are applied. Within the public interest test, the District ensures that proposed uses do not cause unacceptable impacts to the water resources or related natural environment. Under this criteria the District regulates such impacts as drawdowns in lake levels and impacts on wetlands, reductions in streamflows, and saltwater intrusion or upconing, among others. Under the final test, the District prevents unacceptable impacts to previously permitted and/or statutorily exempt (e.g., domestic) uses.

Proposed uses which do not meet all of these criteria are either denied or, as is more common, modified to comply with District permitting criteria. Conditions are placed upon permits that are applicable to each type of use. These permitting conditions can require water use and water quality monitoring, compliance with water use efficiency levels (e.g., irrigation efficiency, per capita rates, etc.), and environmental monitoring and mitigation, among others.

Each of the four main water use permit types have water conservation requirements particular to the type of use being permitted (agricultural, public supply, industrial/commercial or mining). Examples of this include tailwater recovery for agricultural operations; using rain sensors for golf course, lawn and landscape irrigation; using reclaimed water for agricultural operations and for lawn watering in public supply service areas; following a water budget in mining operations; reclaiming their own used water in certain industries for commercial enterprises; and making efforts to achieve a 150 gallon per day use rate for public supply permittees.

Water use permits are issued for limited periods of time, typically ranging from six to ten years. However, the District has the capability to issue, and has issued, permits for both shorter and longer durations. The District is statutorily

allowed to issue permits up to a maximum of twenty years for most use types, and up to fifty years for public supply permittees. Permits are fully reevaluated when they come in for renewal. During this renewal process, the District reassesses the permit in light of improved knowledge on the availability of water resources, documented impacts to water and related natural resources (or the lack of such impacts), improved water use efficiencies applicable to the particular use type and mitigation criteria, among other criteria.

The District continues to support the "Local Sources First" legislation adopted in 1996 as a means to promote efficient use of available water resource in an area. While this statutory provision is generally applied on a county by county basis, projects undertaken by Tampa Bay Water within its three-county jurisdiction are exempt from these provisions.

As of 1999, the District monitors over 8,300 active water use permits Districtwide. The majority of these (over 6,700) are for agricultural water uses. Approximately 530 are for public supply uses, while the remainder are for industrial, commercial, recreational, power generation, mining and a host of other purposes. For a more detailed description of the District's WUP program, the reader is referred to Rule 40D-2, F.A.C., and the associated Basis of Review.

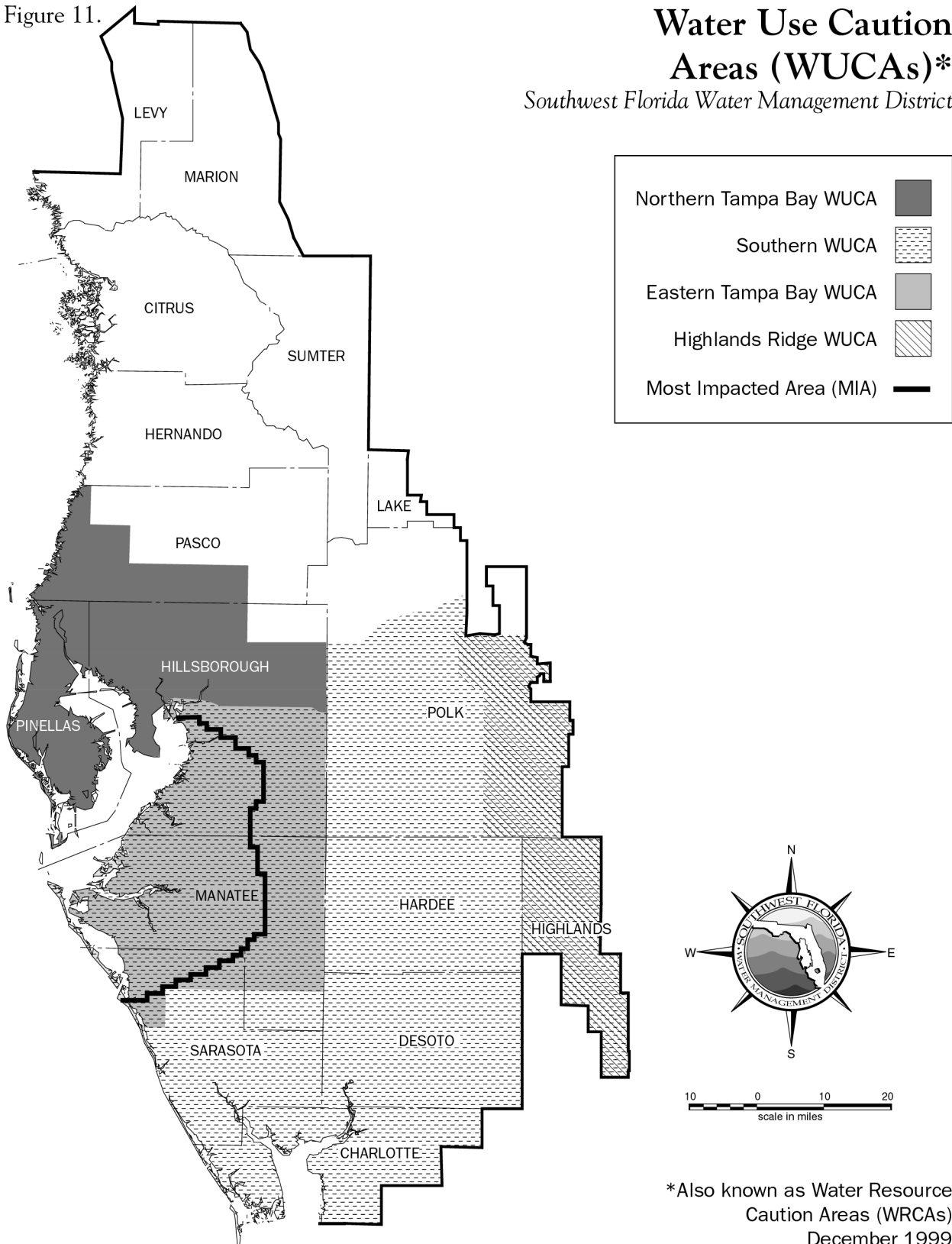
Water Use (or Resource) Caution Areas (WUCAs/WRCAs)

In the late 1980s the District realized that certain interim resource management initiatives could be implemented to help prevent existing problems in certain areas of the District from getting worse prior to the completion of the multi-year WRAPs. As a result, in 1989, the District declared each of the areas depicted in Figure 11 a WUCA, or Water Resource Caution Area as they are referred to in Chapter 62-40, F.A.C. For each of the initial three WUCAs, a

Figure 11.

Water Use Caution Areas (WUCAs)*

Southwest Florida Water Management District



*Also known as Water Resource Caution Areas (WRCAs) December 1999

three-phased approach was implemented, including: (1) short-term actions that could be put in place immediately, (2) mid-term or intermediate actions that could be implemented concurrent with the ongoing WRAPs, and (3) long-term actions that would be based upon the results of the WRAPs. Short-term actions for each WUCA included the establishment of a Work Group that was comprised of representatives from all types of water users within each WUCA (e.g., public supply, agriculture, industry), local governments, environmental representatives and other interested parties. These Work Groups were convened to assist the District in developing management plans for each WUCA. The main goal of these plans, adopted in 1990 and 1991, was to stabilize and restore the water resource in each area through a combination of regulatory and non-regulatory efforts. The interested reader should consult each WUCA management plan for more details.

One of the primary means of implementing the WUCA management plans was through modifications to the District's WUP rules for each specific WUCA. These modifications primarily addressed additional conservation requirements and the investigation of alternative water sources, including reuse, for water use permittees. One significant additional change was the designation of the Most Impacted Area (MIA) within the Eastern Tampa Bay (ETB) WUCA, within which no net increase in permitted water use from the Floridan aquifer was allowed by significantly limiting the issuance of new permitted quantities.

Each permit type located in a WUCA has stringent limitations on their water use. Permits are conditioned to require the following:

- ❖ **Public Supply** - Per capita water use demands are limited to 150 gallons per person per day. Any utility not able to meet these numbers at time of permit issuance have strict timeframes and detailed implementation

guidelines to allow the utility and its customers to meet that limit in a short period of time.

- ❖ **Recreation/Aesthetic** - Golf courses in particular have limitations set on the types of turf that are irrigated. For example, fairway acreage is limited and defined, and no quantities are allotted for irrigation of roughs.

- ❖ **Agriculture** - Certain irrigation water application efficiencies are imposed by crop, irrigation and soil type. These efficiencies were established locally in conjunction with the University of Florida's Institute of Food and Agricultural Sciences (IFAS) experts. While there are efficiencies also in place outside of a WUCA, the efficiencies are more stringent for agricultural operations inside a WUCA.

- ❖ **Mining** - Permits operate under more stringent limitations when located inside of a WUCA. Recirculating of off-site discharge is strongly encouraged at these sites.

Realizing that the Southern Ground Water Basin (SGWB) should be managed in a comprehensive fashion, the entire southern part of the District encompassing this basin was declared the SWUCA in October of 1992. As with the previous WUCAs, the District convened a Work Group to assist in the drafting of a management plan for the area. The Work Group concluded a year-long series of meetings in late 1993. The District completed the management plan for the SWUCA in mid-1994 and subsequently initiated rulemaking. This SWUCA Rule was ultimately challenged and has not gone into effect pending appeal. In 1998, given improved resource conditions, new legislative direction and recognition of the long-term nature of the resource constraints, the District initiated a reevaluation of the SWUCA management strategy. This process is ongoing as of early 2000, with a current focus on maximizing water resource development opportunities through development of the Regional Water Supply Plan (RWSP), and will be reported on in future updates of the Plan.

3. Water Resource Assessment Projects (WRAPs)

In the late 1980s, the District initiated a program to conduct WRAPs to assess water availability in several regions. These projects are detailed assessments of the water resources and include intensive data collection and monitoring to characterize hydrologic conditions and determine effects of water withdrawals. There are five areas in the District for which WRAPs have been initiated. The first three WRAPs were initiated in the late 1980s and early 1990s for the Northern Tampa Bay, Eastern Tampa Bay, and Highlands Ridge areas (Figure 12). These projects were initiated in response to lowering of lake levels, drying of wetlands, and the increased landward movement of the freshwater/saltwater interface. In the mid-1990s, a fourth WRAP was initiated that covered the southern portion of the District and encompassed both the Eastern Tampa Bay and Highlands Ridge WRAPs. The purpose of this WRAP is to assess the cumulative effects of all water withdrawals in the region. The fifth WRAP is being conducted for the northern portion of the District, primarily focusing on areas north of Pasco County. The data collection element for the Northern District WRAP was initiated in 1998 to provide baseline hydrologic conditions. The Eastern Tampa Bay WRAP was completed in 1993 and the Northern Tampa Bay WRAP was completed in 1996. The Southern District WRAP and Northern District WRAPs are scheduled to be complete by 2005 and 2010, respectively. Completion of these detailed assessments provides the technical foundation for determining water availability and can assist in the establishment of minimum flows and levels. Once the studies are completed, water resource management programs established in these areas can be modified as necessary.

In 1999, the District initiated the Northern Tampa Bay Phase II investigation as a follow-up to the Northern Tampa Bay WRAP. Through a series of projects, this study will continue assessments of the biologic and hydrologic systems in Northern Tampa Bay to support the ongoing development of minimum flows and levels, water resource recovery, Water Use permitting, and Environmental Resource permitting. Projects will include the further development of minimum flows and levels methodologies, assessments of rehydration techniques, and expanded biologic and hydrologic data collection. These studies will continue through 2010.

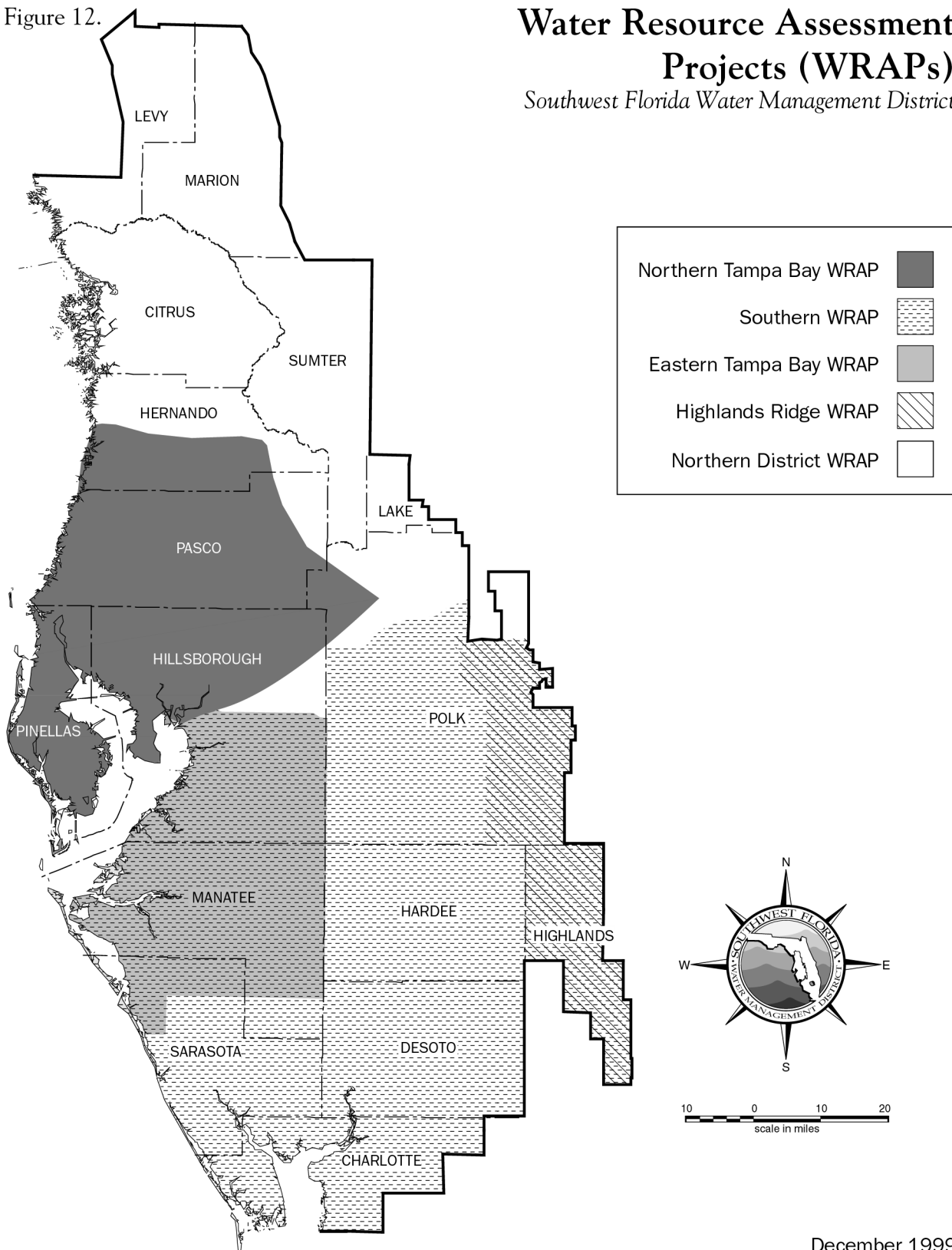
4. Water Quality Monitoring Program (WQMP)

The WQMP at the District oversees the IWRM program which is a cooperative effort between the Florida DEP, the five water management districts and other entities within the District which are responsible for water quality monitoring, assessment and regulation. This effort is directed towards determining and tracking the quality of the water resources throughout the state, including both surface and ground water. The quality of the aquifers will be determined using a random sample statistical design that is similar to Environmental Protection Agency's (EPA's) Environmental Monitoring and Assessment Program (EMAP). This design facilitates accurate data reporting for large-scale, regional conditions. Other responsibilities of the WQMP for groundwater monitoring included a saltwater intrusion/sulfate upwelling network (Coastal Groundwater Quality Monitoring Network), a springs monitoring network, water quality monitoring associated with projects around selected wellfields and springs, and regulatory monitoring of water use permits for water quality.

Figure 12.

Water Resource Assessment Projects (WRAPs)

Southwest Florida Water Management District



December 1999

5. Regional Observation Monitoring Program (ROMP)

This program has increased the density of the District's groundwater monitoring network since the mid-1970s by constructing additional monitor wells. The data from these monitoring sites are used to evaluate seasonal and long-term changes in groundwater levels, and the interaction and connectivity between groundwater and surface water bodies. The ROMP also performs geophysical logging on existing wells to provide needed data on well construction and water quality, most of which is incorporated into the District's GIS database.

Impacts resulting from increased water demand over the past 30 years have been documented and assessed through analysis of groundwater data. These impacts directly affect the District's planning, regulatory policies and programs. For example, groundwater data are used during the permitting process to model potential impacts of new uses. This information is also used to monitor existing permittees to prevent them from significantly impacting natural systems and existing legal users. If these impacts do occur, the District can respond appropriately.

Construction of new monitor wells also provides the opportunity to collect valuable technical information such as the geologic core that is recovered from various depths (e.g., lithology, water quality, and potentiometric levels). From these data, aquifers and confining units are delineated, the fresh/saltwater interface is determined and water quality within aquifers is characterized. The installation of long-term groundwater monitoring sites for the next few years will continue to target the District's WUCAs. This will provide additional data for the WRAPs, well performance data for wellhead protection projects and the aquifer characteristics inventory.

6. Regional Water Supply Planning (RWSP)

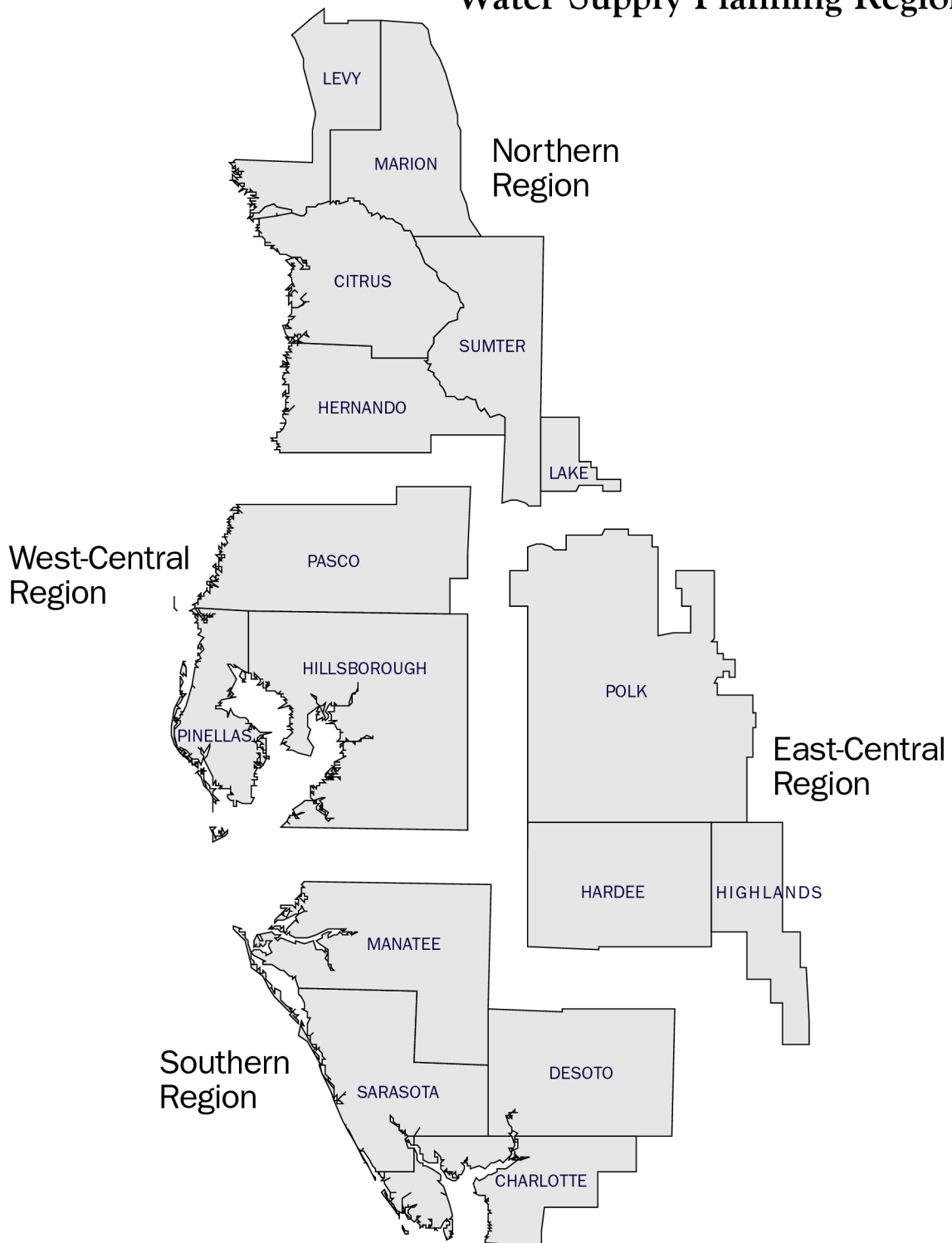
During its 1997 session, the Florida Legislature amended the Water Resources Act (Sections 373.036, F.S.) to clarify agency responsibilities relating to water supply planning and water resource development. A "Districtwide Water Supply Assessment" was required of each water management district by July 1, 1998. The Assessment functions similarly to the Needs and Sources Plan, previously produced by the District, in that it evaluates projected demands, makes water use projections to the year 2020 and compares these demands to the availability of water sources over the twenty-year planning period. In those areas where demands are expected to exceed available water supplies before 2020, a RWSP must be subsequently developed.

The District's Water Supply Assessment was completed and accepted by the Governing Board in June 1998, and is hereby incorporated by reference into the District Water Management Plan. The four water supply planning regions used in the Assessment can be seen in Figure 13, three of which generally coincide with the existing regional water supply authorities in the District. Table 4 summarizes the demand projections for each planning region (see [District Overview](#)).

The Assessment concluded that three of the four planning regions (all but the Northern region) will not have adequate water sources to meet projected demands to the year 2020. The District is currently in the process of developing a regional water supply plan which will encompass the West-Central, East-Central and Southern water supply planning regions. The RWSP is scheduled for completion by early 2001 and represents an important step in the District's water resource and water supply development efforts.

Figure 13.

Southwest Florida Water Management District Water Supply Planning Regions



Source: SWFWMD, Districtwide Water Supply Assessment, June 1998

The RWSP is being developed in an open public process, in coordination and cooperation with local governments and utilities, regional water supply agencies, the agricultural community, business and industry representatives, environmental organizations and other affected and interested parties. This has proven quite useful in identifying data gaps or other ways to improve the RWSP process and results. For example, how the District calculates water use in areas like Sarasota County where many publically supplied users also have separate irrigation wells is being reexamined in the development of the RWSP. This will allow the District to avoid underestimating actual demands while clearly delineating whether this is a localized or regional situation.

The RWSP will contain a five-year work program for the implementation of water resource development projects. Once the RWSP has been completed and accepted by the Board, it will become a part of the District Water Management Plan through incorporation by reference.

7. Water Resource Development

The Florida Legislature also amended Chapter 373, F.S., in the 1997 session to introduce and define the terms “Water Resource Development” and “Water Supply Development.” Water Resource Development is primarily the responsibility of the WMDs and is defined as “The formulation and implementation of regional water resource management strategies, including the collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage water resources; the development of regional water resource implementation programs; the construction, operation, and maintenance of major public works facilities to provide for flood control, surface and underground water storage, and groundwater recharge augmentation; and related technical assistance to local governments and to

government-owned and privately owned water utilities” (Section 373.019 (19), F.S.).

This broad definition has been narrowed in practice, and through interpretation by the Executive Office of the Governor (EOG), to primarily reflect regional projects designed to create, from traditional or alternative sources, an identifiable, quantifiable supply of water for existing and/or future reasonable-beneficial uses. This includes water conservation and wastewater reuse programs which can be considered an additional “source” of water supply. Conservation alone has been estimated to represent 15-20 percent of existing public supply use, for example, yielding a significant new supply for future needs. For additional discussion of District support for conservation and reuse in all water use sectors, see the [District Overview](#) (Part F. Water Use).

“Water Supply Development” is primarily the responsibility of local and regional water supply providers and is defined as “The planning, design, construction, operation, and maintenance of public or private facilities for water collection, production, treatment, transmission, or distribution for sale, resale, or end use” (Section 373.019 (21), F.S.). The RWSP must contain a water resource development component and a water supply development component.

Even prior to having a RWSP, the District has contributed substantial funds toward the development of sustainable water supplies, whether it be through what might be considered “resource development” or “supply development.” These funds come from the Basin Boards’ Cooperative Funding Program, Basin initiatives, the New Water Sources Initiative (NWSI) and the Tampa Bay Partnership Agreement (see below). It remains difficult to classify all District financial assistance as either resource or supply development, but the bottom line is the availability of water supplies is significantly enhanced as a result of District support.

Projects more clearly meeting the “Water Resource Development” definition may see a greater emphasis in future years as the District attempts to address resource issues in the SWUCA. Water resource development needs for the SWUCA have initially been estimated at an additional 250-300 million gallons per day by 2020, at an estimated total cost in excess of one billion dollars. Meeting these needs with alternative sources is essential to protection of surface and groundwater resources, and will require an effective partnership of local, regional, state and federal agencies. The District, in conjunction with others, is actively pursuing federal funding assistance.

8. Financial and Technical Assistance

Financial and technical assistance are provided to water users to expedite the accomplishment of the District’s water management objectives. Over the past decade there has been an emphasis on implementing reuse and conservation projects and supporting regional water resource and water supply development. Both the District and Basin Boards have contributed funds to implement alternative source programs to offset groundwater use. Basin Boards that have WUCAs designated in all or part of their jurisdictions assist water users in addressing conservation and alternative source initiatives identified in the WUCA management plans and rules. Much of this assistance would now be defined as water resource or supply development.

The District’s Basin Boards provide financial assistance for conservation and alternative source programs through the Cooperative Funding Program, primarily to governmental entities. Between 1988 and 2000, a cumulative total of about \$150 million has been provided by the District and matched by local cooperators. Most of this investment has been in Water Supply related projects (about 70 percent), but other projects funded include flood protection, water quality and natural systems enhancements.

The District Governing Board in 1994 initiated a financial incentive program known as the New Water Sources Initiative (NWSI). NWSI was created as an effort to assist in the development of non-traditional alternatives to groundwater use. Since its inception, the Governing Board has budgeted \$10 million annually, an amount matched by the affected Basin Boards, for specific projects. The total District contribution is then matched by the cooperator to develop water supplies. Two example projects are the Tampa Bay Partnership Agreement and the Peace River Option in the SWUCA. It is projected the District will commit in excess of \$240 million towards NWSI projects through FY 2007 (including \$183 million for the Tampa Bay Partnership Agreement). A future challenge will be to assist all appropriate users, potentially including the agricultural sector.

Technical assistance is also provided to the various water use sectors to help achieve sound resource management. Since agriculture is a primary user and an important economic sector in the District, a significant agricultural technical assistance program has been established (see District Overview, Part F.). Similarly, the District provides technical assistance to local governments in developing and implementing water resource and related programs.

9. Land Acquisition

The District's land acquisition program (discussed more fully under Natural Systems Management section) is also used in achieving the District's water supply objectives by making acquired lands available for water supply development, when compatible with the water management purposes for which the lands were acquired. In fact, the District Governing Board has made water supply development potential a major selection criteria in evaluating lands being considered for acquisition. The District presently makes a number of existing District properties available to water supply authorities

and local governments for water supply development. For instance, the Lower Hillsborough Flood Detention Area is utilized by Tampa Bay Water for its Morris Bridge Wellfield, along with the Tampa Bypass Canal (TBC), which is used by the City of Tampa as a source to augment its Hillsborough River reservoir. In addition, a portion of the District's Starkey and Cypress Creek land holdings serve as Tampa Bay Water wellfield sites. Lands acquired in DeSoto County will assist the Peace River/Manasota Regional Water Supply Authority (PR/MRWSA) in developing additional water supplies from the Peace River through expanded aquifer storage and recovery wells on the property.

Lands have also been acquired, or are being considered for purchase, in the watersheds of current and potential surface water supply sources. These include: the Lake Manatee Lower Watershed in Manatee County, where the District has acquired 7,932 acres and has plans to acquire additional acreage; almost 6,000 acres within the RV Griffin Reserve in DeSoto County to further assist the PR/MRWSA; and lands approved for acquisition along Prairie and Shell creeks to protect the potable water supply for the City of Punta Gorda. It is important to note that, regardless of the primary purpose of a land acquisition, all acquisitions also serve to protect or restore natural systems.

10. Local Government Planning Assistance

The District has a comprehensive local government planning assistance program. In general, this program is intended to assist local governments in incorporating sound water management principles and the best available water resource information into their comprehensive plans. This assistance deals with all aspects of water management, including water supply, flood protection, water quality management and natural systems management, as these issues are addressed by local governments in their plans. For water supply

planning, the District has and must continue to, cooperate with local governments to develop consistency and compatibility in our respective water supply planning programs. This will include consistent projections of future demands and the identification of sources to meet these demands, including conservation, reuse and alternative sources.

Planning assistance has also included review of Local Government Comprehensive Plans, the associated Evaluation and Appraisal reports and updates to the plans. The District comments to the Florida DCA on plan amendments, and also participated in the preparation of Strategic Regional Policy Plans prepared by the regional planning councils.

1-1.2 Source Protection Programs

This section addresses the District's responsibilities to protect both ground and surface water supply sources. It focuses primarily on the protection of potable water supply sources, however, in certain cases it also addresses protection of sources for other uses. There is a strong correlation between this section and the Water Quality section of this Plan.

The District has a number of programs aimed at ensuring the protection of ground and surface water supply sources. These initiatives are discussed in the following sections. The emphasis of these programs is on protecting the **quality** of these sources, in contrast to the preceding discussion of water supply needs and sources' emphasis on water **quantity** issues. Some programs described under Needs and Sources (e.g., Hydrologic Conditions Monitoring, WQMP and ROMP) also apply to Source Protection and will not be duplicated in the following summary of specific aspects of the District's efforts to protect water supply sources. The District also works closely with other agencies to protect sources, with a prime example being the Source Water Assessment Program (SWAP) of the Florida DEP.

1. Water Resource Assessment Projects and Water Use Caution Areas

Discussed more fully under the Needs and Sources Programs, the District's WRAP and WUCA initiatives are generally directed at source protection, and specifically at assuring human use of the resource does not exceed nature's ability to replenish our supply. Increasing water withdrawals and, in some areas, below normal rainfall have created regional impacts such as lowered lake levels, impacts to wetlands, water quality deterioration in coastal areas and the lower part of the aquifer, and decreased pumping efficiencies for existing legal users due to lowered aquifer levels. WRAPs have been implemented to assist in determining the quantity of water that should ultimately be permitted from the groundwater system. Once determined, management plans are developed to ensure appropriate management of the resource. This demonstrates the close relationship between water supply quantity and quality, where overuse can subject a good quality water source to degradation.

2. Water Use Permitting

As previously described, the WUP program is primarily aimed at allocating various sources of water to varied demands; however, it also has source protection components. In the broadest sense, the WUP program helps to protect sources of water from contamination that might otherwise be caused by overwithdrawal. In addition, among the revisions incorporated into the WUP rule in 1989 was a provision to regulate impacts of known sources of groundwater contamination. For a more detailed description of the District's WUP program, the reader is referred to Rule 40D-2, F.A.C., and the associated Basis of Review.

3. Well Construction Permitting

Well construction permitting is one of the primary regulatory means by which the District protects ground (and surface) water sources from degradation while protecting the quality of water for potable uses. District rules relating to well construction practices, well abandonment and water well contractor licensing are contained in Chapter 40D-3, F.A.C., including DEP rules incorporated into 40D-3, F.A.C., by reference. These rules are intended to ensure that all water wells and test or foundation holes within the District are located, constructed, maintained, used, and abandoned in a manner that protects the water resource.

Ground water is a good source of sanitary drinking water in most of the District's 16-county area. Certain areas of the District, however, have proven more vulnerable to contamination. As a result, the Legislature required that the Florida DEP establish rules to help prevent further contamination of potable water wells. Chapter 62-524, F.A.C., delegated implementation of these rules to the WMDs, specifically well construction regulations. As part of these rules, the DEP has provided the WMDs with maps delineating known areas of contamination. Areas along the Lake Wales Ridge in Polk and Highlands counties are the most extensive delineated areas within the District's jurisdiction.

Depending on the proposed location and use of a well, stipulations are added to the Well Construction Permit (WCP) in areas "delineated" for concerns regarding known or potential contamination. These stipulations require domestic and potable wells to be constructed into an aquifer that is less likely to be contaminated. This process helps protect the user of the well in such areas and prevents further contamination of the aquifer. Other conditions may be placed on WCPs throughout the District to avoid interconnection of aquifers (or portions of an aquifer) of varying water quality to assure resource protection.

The Well Construction Permitting program is closely related to the Water Use Permitting program. If the outside diameter of a proposed well is six-inches in diameter or greater, the well must be included in a Water Use Permit (WUP) before the WCP can be issued. Also, if a proposed well, other than a domestic well, has an outside diameter greater than two inches and is on property associated with a WUP, the proposed well must be included on the WUP before the WCP can be issued. This coordination enables the District to evaluate larger diameter wells, or numerous smaller diameter wells, to determine if the withdrawals will cause adverse impacts.

Manatee and Sarasota counties had existing well construction permitting programs prior to the District implementing its WCP Rule in October 1978. Manatee County began its program in 1963, while Sarasota's was initiated in 1962. These counties retained their well construction permitting authority when the District began its program through delegation of authority from the District, and continue to work closely with the District to ensure that the respective programs are consistently implemented.

4. Quality of Water Improvement Program (QWIP)

The QWIP was established in 1974 through Chapter 373, F.S., to restore groundwater conditions altered by well drilling activities. The QWIP's primary goal is to preserve ground and surface water resources through proper well abandonment. Plugging abandoned artesian wells eliminates the waste of water at the surface and the degradation of groundwater from inter-aquifer contamination. Wells constructed prior to current well construction standards are often deficient in casing and expose several aquifers of varying water quality to one common wellbore. These wells exist by the thousands and allow potable water supplies to be contaminated with mineralized water from deeper exposed aquifers. Contaminated and potable water is allowed to

flow to the surface, wasting water and contaminating surface water from the flow of mineralized water. Section 373.207, F.S., requires that all abandoned artesian wells be plugged. This must be accomplished to prevent further degradation of water resources.

Plugging wells consists of pumping cement from the abandoned well's total depth back to the surface. Confinement is thus reestablished and mixing of varying water qualities and free-flowing is stopped. Prior to plugging an abandoned well, the well is geophysically logged to determine the proper plugging method and provide background water quality and geologic data for inclusion in the District's data base. These data are used in the WRAP studies discussed above to determine changes in water quality since the well was constructed.

The emphasis of this program is in the southern half of the SWFWMD where intact confining layers are pressurized, creating an artesian effect. Chapter 373, F.S., requires that artesian systems, those areas where water in a well will rise naturally above the confining unit, be specifically addressed.

Historically, the QWIP has proven to be a cost-effective method to prevent waste and contamination of our potable water resources, both ground and surface waters. In January 1994, the District increased QWIP funding as an incentive for property owners to comply with well plugging requirements contained in the Florida Statutes. Since its inception in 1974, the program has ensured the plugging of 2,537 wells, of which 62 percent (or 1,583 wells) have been plugged since the 1994 increase in funding. This has resulted in significant water savings, ranging from 65 to 245 million gallons per day (mgd) saved from freely flowing wells and between 15 to 30 mgd in inter-aquifer exchange.

5. Wellhead Protection

Wellhead Protection (WHP) refers to the protection of potable supply wells from the potential release of contaminants to the groundwater system. The requirements for developing WHP programs originated in the 1986 amendments to the EPA's Safe Drinking Water Act. The WHP program in Florida is presently being implemented through the DCA's Minimum Criteria Rule 9J-5, F.A.C. This rule requires local governments to identify a "cone of influence" around existing and planned water wells, to protect potable water well fields, and to protect water quality by restricting activities known to adversely affect water quality.

The District's approach to WHP has been to provide financial and technical assistance to local governments. This has been handled through the District's Local Government Assistance and Cooperative Funding programs, and pursued on a county by county basis. The primary role of the District has been to oversee development of the technical criteria used for delineation of wellhead protection areas (WHPAs) so counties can develop their own WHP ordinances. The responsibilities of the counties include development, implementation and enforcement of a WHP or resource protection program. To date, the District has completed wellhead protection area (WHPA) delineation projects in Hernando and Polk counties. In addition to delineating WHPAs, the District trains county staff on the use of the computer models used to delineate the WHPAs. This is primarily to enable the county to facilitate changes to WHPAs that result from changes in groundwater withdrawal patterns, including new groundwater withdrawals.

In addition to overseeing the technical work to delineate WHPAs, the District participates on Technical Advisory Committees for each county to assist and provide guidance in developing their WHP programs. In general, these programs are implemented through WHP or

resource protection ordinances. The ordinances that are developed are unique to each county and are implemented and enforced by the respective counties. The District encourages the counties to pursue interlocal agreements with the incorporated areas within the county and to encourage their adoption of the county ordinances. In this way, uniform protection of potable groundwater supplies is achieved throughout each county. Currently, staff have participated on advisory committees for Citrus, Hillsborough, Polk and Hernando counties. The District also provides technical review and comment on WHP ordinances that are submitted by local governments. Several local governments within the District have submitted ordinances for review and comment, including Hillsborough, Citrus, and Pinellas counties and the City of Temple Terrace.

6. Recharge Area Protection

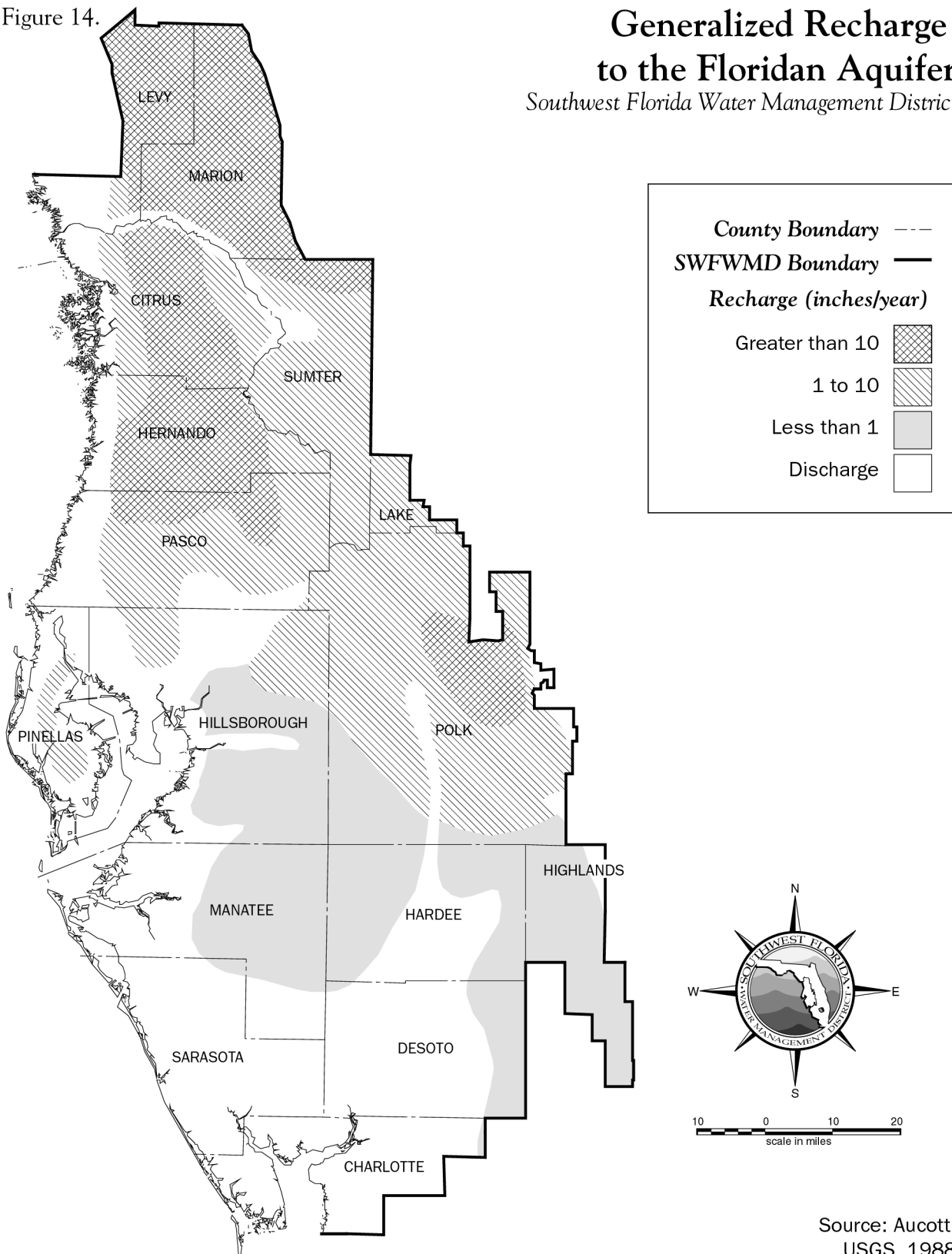
Groundwater recharge to the Floridan aquifer is generally high in the northern portions of the District and more variable to the south. Figure 14 shows generalized recharge to the Floridan aquifer in the District as determined by the USGS.

The District promotes recharge protection primarily through technical assistance to local governments. Regional-scale published recharge maps, for instance, were included in the Ground Water Basin Resource Availability Inventory (GWBRAI) reports. Regional recharge maps were also distributed in the Technical Information Atlas delivered to local governments in June of 1991. In addition, the District, in cooperation with the SJRWMD, contracted with the University of Florida, College of Law, Center for Governmental Responsibility, to develop the "Guide to Local Ground Water Protection in Florida." This three-volume report provides comprehensive information to local governments necessary to develop groundwater protection programs. The District has also provided information to assist local governments in site specific modeling to identify zones of contribution for groundwater sources.

Figure 14.

Generalized Recharge to the Floridan Aquifer

Southwest Florida Water Management District



The District has also moved ahead with its schedule for recharge mapping contained in the original District Water Management Plan. Recharge mapping at the county level has been completed for Highlands, Pasco, Citrus, Hernando, Sumter, Marion and Levy counties. Several area-specific efforts conducted by the District will result in additional recharge protection. For example, the SWUCA remodeling efforts will result in a refined understanding of recharge characteristics for the surficial, intermediate and Floridan aquifer systems in this part of the District. All four WRAPs, and the wellhead protection area delineation project in Polk County will similarly provide better information for recharge protection. The groundwater flow models for each WRAP will be used to derive local project-area recharge rates. The results of the various local projects are assimilated into a Districtwide assessment of recharge as each area-specific project is completed.

In addition, the NWSI of the District, in conjunction with Tampa Bay Water, is funding two innovative wellfield rehydration projects to enhance recharge where it is most needed. The Section 21 and Starkey Wellfield projects will use treated wastewater and/or storm water to replenish the aquifer system. Such efforts are guided by Chapters 17-521 and 17-610, F.A.C., which govern wellhead protection and the reuse of reclaimed water, respectively. Consideration should also be given to the National Research Council publication on Issues in Potable Reuse (1998) as such projects are developed. The District remains keenly aware of protecting source water quality in such instances, with all such projects assessed and permitted on their merits.

One additional method by which the District achieves regional recharge protection is through the Environmental Resource Permit (ERP) program (Chapters 40D-4, 40 and 400, F.A.C.). Recharge protection is derived through requirements to maintain the predevelopment

rate of discharge conditions from development sites, which retains water on site for recharge greater than would occur if unregulated. This program is discussed more completely in the Flood Protection section of this Plan.

7. Land Acquisition

The District's land acquisition programs are described in detail in the Natural Systems Management section. These programs require that one or more site selection criteria must be met for a parcel to be considered for purchase with these funds. One potential criteria is that the land serves to protect or recharge ground water. This source protection criteria is a tool the District has used effectively. For example, the Potts Preserve, consisting of approximately 9,350 acres in Citrus County, was purchased partially in consideration of its recharge potential. More recently, the District has participated in the interagency acquisition of the Annuteliga Hammock, in part for its recharge potential. Holding these lands in public ownership (as well as the numerous District properties used for public wellfields mentioned in the Needs and Sources section), and managing them in a manner that attempts to protect and restore the water and related natural resource characteristics of the property, affords the highest degree of protection to these potable water supply sources.

8. Water Shortage Management/Year-round Water Conservation Measures

The core of the District's Water Shortage Management Program is the Water Shortage Plan, adopted as Chapter 40D-21, F.A.C. The Water Shortage Plan provides for the monitoring of hydrologic conditions and demand data to identify potential water shortages. The Water Shortage Plan also provides a means by which the District can reduce water use when it has been determined that there is or will be insufficient water to meet the present or anticipated requirements of users, or when

conditions require a temporary reduction in use to protect water resources from serious harm. In essence, the Water Shortage Plan is a tool to temporarily reduce water use when sources are impacted by drought or other water shortage conditions. The Water Shortage Plan was first employed in 1985 in response to severe drought conditions throughout the District and was invoked again in 1989, with certain restrictions remaining in effect within portions of the District to date. The Plan has been refined several times since 1985. Based upon experience gained, revisions to the Water Shortage Plan are again being considered to effectively implement Sections 373.175 (Declaration of Water Shortage; Emergency Orders), and 373.246, F.S., (Declaration of Water Shortage or Emergency).

The primary focus of Year-Round Water Conservation Measures, adopted as Chapter 40D-22, F.A.C. in 1992, is to prohibit irrigation during the parts of the day when it typically cannot be accomplished efficiently. The Measures also describe and prohibit other wasteful and unnecessary water uses in implementing Section 373.171, F.S.

9. Communication/Education Initiatives

The District has a number of programs designed to complement its water supply regulatory activities. These non-regulatory programs include communication/education initiatives that help local governments, water suppliers and even water users to achieve resource management objectives.

The District's proactive communication/education program supports a broad range of District activities, including our water conservation efforts. Conservation initiatives have focused around a variety of themes over the past several years, such as "Turn It Off," "Know Your Day," "Plant It Smart," "Do Your Part," and "Leave a Legacy." The District also has actively supported Xeriscape™ education and local

Cooperative Extension Service office programming, such as "Florida Yards and Neighborhoods," "Build Green and Profit," "Sell Green and Profit," and "Buy Green and Save," and developed a Community Water Counselors curriculum to teach conservation to home owners through peer instruction. Communication efforts include television, radio and print public service announcements, Web site postings, direct mailings, the District's speakers' bureau, feature-length television programming, publication in industry and trade journals, and appearances on local radio and television talk show formats. Many of these efforts have been, and continue to be, coordinated as statewide partnerships with the other WMDs and regionally with local governments. Communication efforts are discussed more fully in the Implementation Coordination section of this Plan.

Section 2. Issues Assessment

The District is constantly striving to advance its knowledge of the natural hydrologic system and human influences on this system. Through enhanced knowledge, the District can move forward in improving water resource management. It is fundamental that the District should always be striving to improve the effectiveness and efficiency of its resource management efforts. District initiatives such as the WRAPs and associated WUCAs, as previously described, are prime examples of this improvement process. One of the main purposes of this Plan is to provide a mechanism whereby the District can identify areas for potential improvement and develop specific recommendations to achieve these improvements.

The major water supply issues addressed in this Plan include:

1. Meeting Future Water Supply Needs

Specific components include:

- a. Planning for Water Resource and Supply Development
- b. Development of Alternative Supplies
- c. Funding Sources and Allocation
- d. Interdistrict Coordination
- e. Competing Applications

2. The Need to Protect Water Supply Sources

Specific components include:

- a. Mapping and Protection of Recharge Areas
- b. Supporting Wellhead Protection Programs
- c. Addressing Source Contamination from Improperly Abandoned Artesian Wells
- d. Surface Water Supply Source Protection

For each of these issues, action plans are ultimately identified in the Implementation Strategies section.

2-1 Meeting Future Water Supply Needs

Florida's water management districts face tremendous challenges in meeting the burgeoning water supply needs of a rapidly growing population while still maintaining natural systems. As noted in the Florida Water Plan (1995), "Florida's economic future and quality of life are tied to water resources." Nowhere is this more true than in the SWFWMD, where sustainability issues and legislative direction to meet all existing and future reasonable - beneficial uses have resulted in unique water resource partnerships. Continued success in the Northern Tampa Bay area, in the Southern Water Use Caution Area

and throughout the balance of the District will require resolution of a number of aspects of meeting future water supply needs.

Planning for Water Resource and Supply

Development is an essential precursor to timely, cooperative development of water resources.

The District must complete, maintain and subsequently update its Regional Water Supply Plans. These efforts must be effectively coordinated with each major water use sector, including public and private utilities, water supply authorities, agriculture, industry and others. Such coordination can surface important resource issues such as the accuracy of Sarasota County's existing and future water demands. The District has historically not included demands from irrigation wells for customers on public utilities. Though this use has not previously been considered a significant component of demand, local interests have raised it as an issue due to problems experienced by users of the shallow and intermediate aquifers in portions of the County. As part of the RWSP the District intends to estimate such demands in order to determine the extent of this issue and avoid underestimating overall water demands.

Development of Alternative Supplies involves the District facilitating the timely development of alternative water supplies through a combination of regulatory and non-regulatory (incentive based) approaches within all areas of the District, but particularly in those areas where traditional sources (ground water) are limited relative to demand. **Funding Sources and Allocation** are highly related to the development of **both** alternative and traditional supplies. Alternative sources are likely to be more expensive than existing sources for some communities and user groups. Available District funding sources are likely to be inadequate to meet the substantial cost of developing new water supply sources needed (whether through "Water Resource Development" or "Water Supply Development Assistance" - see 373.0831, F.S.) to meet all current and future

reasonable and beneficial water uses. The cost of developing new quantities in the SWUCA alone has been estimated at over one billion dollars by 2020. This raises the issue of not only the sufficiency of current District funding mechanisms, but how the short- and long-term costs will be allocated among water suppliers and water users. Moreover, the District is faced with making increasingly difficult water resource allocation decisions within areas where existing and future demands exceed the available supply (e.g., in the SWUCA). Alternative allocation mechanisms exist (including voluntary, incentive-based approaches) which may improve the effectiveness and efficiency of District decision making.

Interdistrict Coordination remains an issue for the District, reflecting the need to continue and enhance collaboration among the districts, especially as it relates to shared boundaries that encompass regional water supply planning areas. One area being closely coordinated already is the possibility of **Competing Applications**, a statutory tool for allocating water resources among users when the limits of the resource in a particular area have been reached. Though this approach has not been used in the State, and the Legislature has directed the District to avoid competition for water supplies, it remains an issue as to how this option might be effectively utilized in the public interest.

2-2 The Need to Protect Water Supply Sources

The chief threats to groundwater resources are overdraft and contamination. Overdraft occurs when groundwater withdrawals consistently exceed recharge, causing a long-term decline in groundwater levels. This human-induced imbalance results in going beyond safe yield. Overdraft may lead to saltwater intrusion if the fresh water in an aquifer is reduced enough to allow saltwater to move upward from underlying sources or laterally from coastal areas. Excessive groundwater withdrawals may also cause the

lowering of surface water levels and flows and the shortening of wetland hydroperiods. Sources of potential contamination include nitrates from fertilizers and other sources, injection and drainage wells, underground storage tanks, pesticides and other plant control substances, septic tanks, landfills, industrial waste sites, polluted surface waters and chemical spills, among others. The Floridan aquifer is most susceptible in the northern part of the District where it is not protected by a continuous, overlying impermeable layer.

The nature of aquifer media and the typically slow rate of groundwater movement in most parts of the District make rehabilitation of contaminated aquifers exceedingly difficult and costly.

Prevention, therefore, is the appropriate emphasis of groundwater policy as it relates to source protection. Local wellfield protection programs, recharge protection and regulation of known ground water pollution sources are the major initiatives needed to ensure a continuing supply of high quality ground water.

Opportunities exist to expand District efforts in the **Mapping and Protection of Recharge Areas**, both in terms of water quantity and quality, as a means of ensuring the long-term integrity of groundwater resources. Similarly, the District should explore opportunities to become more proactive in assisting local governments in developing and implementing **Wellhead Protection Programs**.

The District has made significant progress in addressing its statutory charge related to **Source Contamination from Abandoned Artesian Wells**, but should evaluate the necessity of enhancing these efforts in critical water supply regions such as the SWUCA.

Through a much smaller proportion of freshwater is obtained from surface waters in the District, **Surface Water Supply Source Protection** is also vital. As noted in the discussion of water supply needs and sources, use of this source will increase in the future, particularly in the southern portions of the District. The largest threat to surface water bodies supplying water for human consumption is surface water runoff from developed areas and construction, mining and agricultural sites. District surface water permitting (the Environmental Resource Permit) serves to protect the quality and quantity of surface water supply sources.

Section 3. Water Management Policies

The following policies provide long-range guidance to the District in fulfilling its statutorily-based water supply management responsibilities. These policies express the position or strategy of the District which will be applied consistently in response to various resource management issues. In this case, "District" refers to the Governing Board and Basin Boards, since both make funding and other decisions in the best interest of the resource.

These policies may be implemented only to the extent that financial, staff or other necessary resources are available, pursuant to the budgetary actions of the Governing Board and Basin Boards. These policies do not create any regulatory authority and may require rule making as one component of their implementation. The policies contained within the Plan shall be reasonably applied where they are environmentally, technically and economically feasible. These policies shall be construed and applied as a whole, in recognition of the policies within all areas of responsibility within the Plan, and no specific policy shall be construed or applied in isolation from the other policies in the Plan.

3-1 Needs and Sources Policies

It is the policy of the District to:

1. Ensure that withdrawals from ground and surface water sources do not cause unacceptable impacts on: existing legal users, lake levels, stream flows, or wetlands, nor cause salt water intrusion, upconing, contaminant plume movement or flooding.
2. Incorporate ecosystem management concepts in long-range water supply planning, management, development and regulation.
3. Periodically evaluate available water supplies and existing and future water needs, and conduct sound water supply planning that recognizes environmental and socioeconomic constraints on development of the resource.
4. Encourage the development of local sources, demand management measures, and alternative sources to the greatest extent practicable, considering the environmental, economic and technical feasibility of such alternatives.
5. Support the planning for, and development of, water supply sources on a regional basis. When the development of sources outside a local jurisdiction are determined to be necessary due to inadequate supply, encourage such development to occur through appropriate regional entities.
6. Facilitate the use of regional water supply systems that draw from multiple sources of water and the interconnection of such systems to ensure environmental and water supply sustainability.
7. Encourage the use of the water of the lowest acceptable quality for the purpose intended.
8. Encourage, assist in, and where appropriate, require the development and efficient use of alternative sources of water, including the reuse of reclaimed water, harvesting of high flows, desalination, stormwater reuse and other appropriate alternative sources.

9. Promote compatibility between the District's water supply planning and that of local governments, utilities, regional water supply authorities and others.
10. Promote adequate water supply storage through off-stream reservoirs or aquifer storage and recovery, in order to lessen impacts to aquatic habitats and wetlands and maximize year-round water availability.
11. Evaluate water conservation technologies for all user types and sources. Promote, and where necessary, require water conservation policies and practices in all use sectors to ensure efficient use of the water resource.
12. Monitor hydrologic conditions and water demands, and when warranted, impose appropriate water shortage restrictions as necessary to protect water resources and water supplies of the District.
13. Periodically update plans guiding the District's response to droughts and other forms of water shortages.
14. Actively seek and encourage the cooperation and assistance of state, local government and local law enforcement officials, and the public in the enforcement of water use restrictions during declared water shortages.
15. Encourage the adoption of local water shortage plans and ordinances that are consistent with the District's Water Shortage Plan to improve the effectiveness of compliance and enforcement activities performed by local governments.
16. Seek all funding sources for Water Resource Development.

3-2 Source Protection Policies

It is the policy of the District to:

1. Ensure the protection of ground and surface water sources through regulatory, land acquisition and research programs, and through coordination/technical assistance to local governments.

2. Protect water supply reservoirs and their contributing watersheds.
3. Support local government efforts to protect existing and proposed wells and wellfields from contamination due to activities within contributing areas.
4. Restore previously impacted ground and surface water systems, through permitting, land acquisition and restoration, research and local government assistance.
5. Assist local governments in the development of comprehensive recharge and watershed area protection programs.
6. Protect ground and surface water supply sources as a significant component of the CWM initiative.

Section 4. Implementation Strategies

Implementation strategies are the means through which the District responds to identified issues to improve water resource management. They are the synthesis of all our planning. Within this section, implementation strategies are described for all of the District's major water supply issues previously identified. The format includes, as appropriate, tasks, schedules and identification of responsible entities. It is important to remember that many of the District's existing programs serve as the foundation for responsive strategies, e.g., water use permitting as it relates to water resource allocation.

4-1 Meeting Future Water Supply Needs

Task 1: Complete RWSP for West-Central, East-Central and Southern planning regions by March 31, 2000, and update at least every five years.

Responsible Entity: District Resource Conservation and Development Department.

Task 2: Implement subsequent phases of evaluating water resource and water supply development projects recommended in the RWSP.

Responsible Entity: District Resource Conservation and Development Department.

Task 3: Develop, implement and update on an annual basis the Five-Year Water Resource Development Work Program pursuant to 373.0361 and 373.536, F.S.

Responsible Entity: District Resource Conservation and Development, and Finance departments.

Task 4: Update Districtwide Water Supply Assessment by no later than June 2003, and at least every five years thereafter.

Responsible Entity: District Resource Conservation and Development Department.

Task 5: Update five-year Basin plans annually to reflect changing priorities and needs.

Responsible Entity: District Planning Department; Basin Boards.

Task 6: Complete all required Water Supply related annual documents, including:

- a. District Water Management Plan Annual Progress Report
- b. Annual update to the Minimum Flows and Levels Priority List and Schedule
- c. Annual update to the Five-Year Water Resource Development Work Program
- d. Annual Report on Alternative Sources
- e. Annual Report to Office of the Governor regarding District funding for Water Resource Development

Responsible Entity: District Planning, Resource Conservation and Development and Finance departments.

Task 7: Complete SWUCA reevaluation by December 2001 for Governing Board approval and possible rulemaking.

Responsible Entity: District Planning, Resource Conservation and Development, Regulation and General Counsel departments, SWUCA Working Group.

Task 8: Assist in the implementation, if appropriate, of a fourth regional water supply authority in the District (Polk, Highlands, Hardee counties) on an ongoing basis.

Responsible Entity: District Resource Conservation and Development Department, Governing Board, Peace River Basin Board.

Task 9: Continue to coordinate with adjacent water management districts, particularly the SJRWMD and SFWMDs under the auspices of the existing Water Supply Coordination Memorandum of Understanding. Identify and evaluate all existing water supply interdistrict coordination efforts and determine any needed enhancements by November 1, 2000.

Responsible Entity: District Planning, Regulation and Resource Conservation and Development departments; other WMDs.

Task 10: Identify and include in the District's Five-Year Land Acquisition Plan the major land acquisitions needed for Water Supply enhancement and protection by December of each year.

Responsible Entity: District Land Resources Department; Governing Board; Basin Boards.

Task 11: Continue to monitor and participate in legislative and other discussions regarding Competing Applications.

Responsible Entity: District General Counsel's Office, Regulation and Planning departments.

Task 12: Complete WRAPs according to the following schedule:

- a. SWUCA by 2005
- b. Northern District by 2010

Responsible Entity: District Resource Conservation and Development Department.

Task 13: Complete Northern Tampa Bay Investigation - Phase 2 by 2010, including use of a long-term independent scientific peer review process that involves coordination with local governments, Tampa Bay Water, government-owned and privately owned utilities, environmental regulation agencies, the Tampa Bay Estuary program, public interest groups and other affected and interested parties.

Responsible Entity: District Resource Conservation and Development Department.

4-2 The Need to Protect Water Supply Sources

Task 1: Complete recharge mapping for all remaining counties according to the following schedule, and provide this information to all counties in the District in a useful form.

By 2001: Hillsborough, Polk, Charlotte, Sarasota, Manatee, Hardee, DeSoto counties. (Note: must follow date of completion of the SWUCA groundwater modeling effort.)

By 2005: Pinellas County

Responsible Entity: District Resource Conservation and Development Department

Task 2: Assist local governments with technical information, cooperative funding and planning assistance as needed in the development of wellhead protection zones and ordinances.

Responsible Entity: District Planning, Resource Conservation and Development departments, Basin Boards.

Task 3: Locate, inspect and provide funding assistance for 200 qualified abandoned artesian wells per year until all known detrimental wells are plugged through the QWIP.

Responsible Entity: District QWIP Section; Governing Board, Basin Boards.

Task 4: Update the District's Water Shortage Management Plan to assure maintenance of an effective tool to temporarily reduce water use when sources are impacted by drought or other water shortage (September 2000). Coordinate with other water management districts to seek greater consistency among plans.

Responsible Entity: District Records and Data Department.

Task 5: Complete all CWM plans according to the schedule contained in the Water Quality Management section of this Plan.

Responsible Entity: District CWM teams; Planning Department.

Task 6: Maintain effective coordination with the source water assessment program (SWAP) of DEP on a continuous basis, including an appropriate District monitoring role.

Responsible Entity: District Resource Conservation and Development, and Resource Data Department.

Section 5. Performance Measures

The District has an existing Effectiveness Measures initiative. The purpose of this effort is to develop methods to measure accomplishment of the District's mission and goals, provide regular trend information to decision makers and create public awareness of District accountability. This process develops a picture of the "state of the resource" to assure adequate water supply, protection of water quality, flood protection and preservation of natural systems. It is discussed in greater detail in the Management Services section.

In addition, the District has been working with the EOG and the DEP to develop "core" performance measures for both budgeting and water management planning purposes. These are measures that all the districts have in common, with each district free to have additional measures as needed. Measures have been developed for each of the four major areas of responsibility, as well as for all four areas collectively. The entire set of measures developed is shown in the Water Management Goals and Policies section, while those noted below are for Water Supply only. In addition, the core measures previously portrayed in the District's 1998 District Water Management Plan Annual Progress Report (see Figures 15 and 16) are shown below as examples of how the measures will be graphically depicted.

5-1 Water Supply Measures

Objective 1: Increase available water supplies and maximize overall water use efficiency to meet identified existing and future needs.

- a. 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, and
 1. Percent of estimated amount of water actually made available.

2. Percent of estimated amount under development.
- b. Within each water supply planning region, the estimated additional quantities of water supply made available through District water supply development assistance.
- c. Percentage of domestic wastewater reuse (reuse capacity and flow).
- d. Gross per capita public supply water use by water supply planning regions, county, and District.

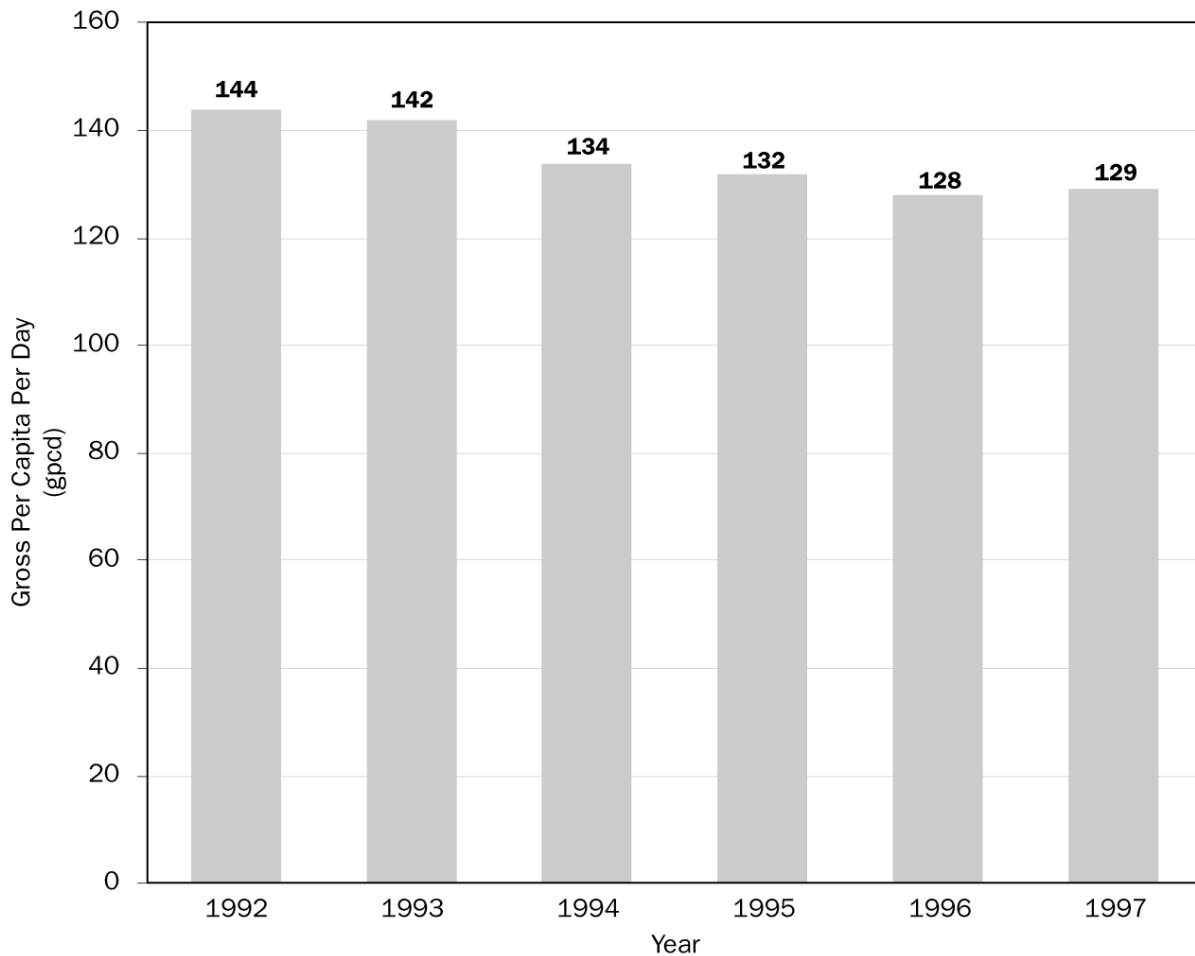
Objective 2: Prevent contamination of water supply sources.

- a. Percentage of surface water supply sources for which water quality fully attains the designated use.

Figure 15.

Gross Per Capita Public Supply Water Use for the SWFWMD

While it is recognized there are many factors which influence water usage (e.g., effective rainfall) there is a clear trend toward reduced usage in the District. This trend can be attributed, in part, to the increasing availability of reuse systems, water conservation programs, enhanced public awareness and related factors. During the period examined, annual gross per capita water use in the District has decreased from 144 to 129 gallons per person per day, a 10% reduction. Per capita public water supply use is calculated by dividing the total public-supplied water withdrawn (in gallons per day) by the estimated population served.

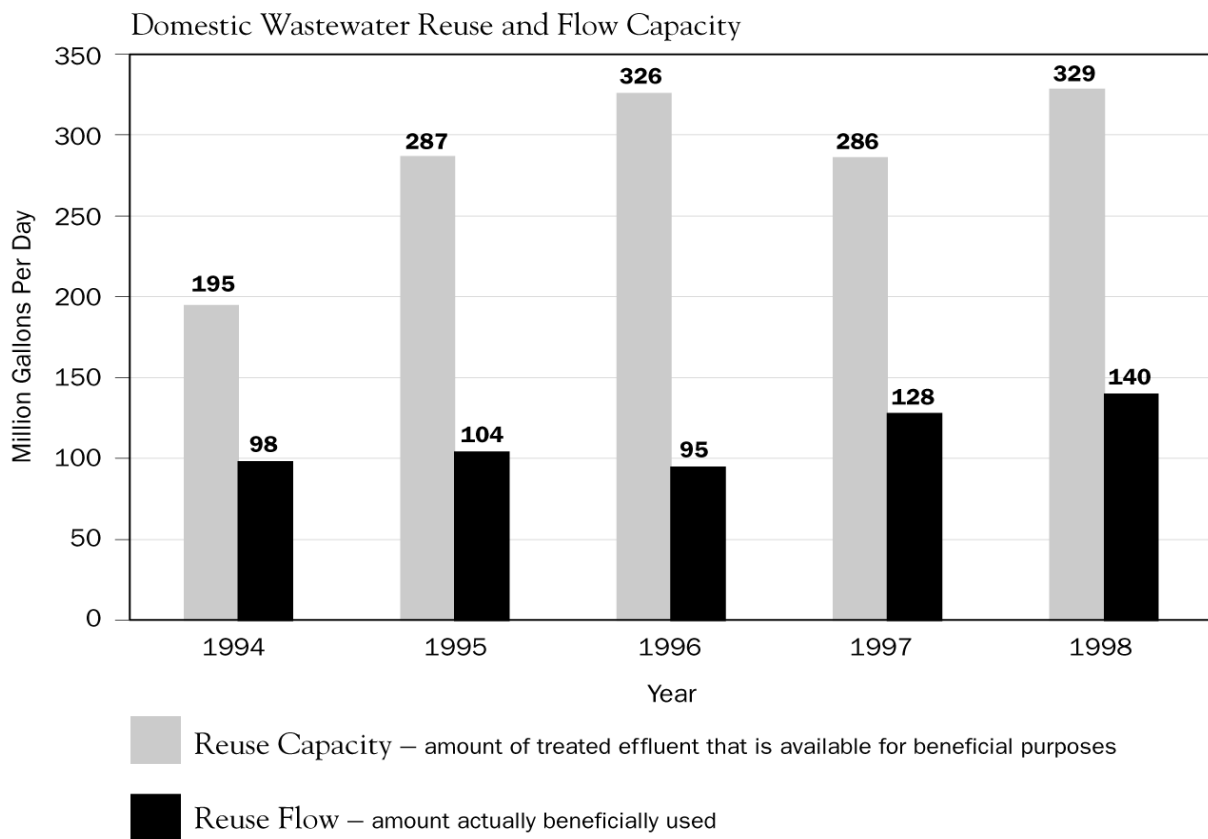


Source: *Estimated Water Use* reports in the SWFWMD

Figure 16.

Percentage of Domestic Wastewater Reuse Flow and Capacity

The State and the District have placed high priority on wastewater reuse in recent years. At present, almost forty-three percent (140 of 329 mgd) of the flows from domestic wastewater treatment plants in the SWFWMD are put to beneficial uses, such as irrigation and industrial processing. This represents about a forty-one percent increase in reuse flow over the five-year period.



Source: *Annual Reuse Report 1994–1998*,
SWFWMD

PART C. Flood Protection

The SWFWMD was originally created in 1961 as a flood control district. For more than half of its history, flood control has been the primary area of responsibility for the agency, and flood protection remains an important District function today. However, with increasing emphasis on other water management responsibilities and a fortunate climatic cycle that has produced relatively few serious floods over the past 25 years, flood protection recently has not received as much attention from the District as water supply planning, water shortages, surface water pollution and natural systems protection.

Flooding is a natural occurrence. It occurs when heavy rainfall exceeds the capacity of streams, lakes, and other natural features to absorb stormwater runoff. These large rainfall events cause normally dry areas to be inundated, becoming temporary storage areas for excess stormwater. Flooding also may occur when abnormally high tides or storm surges cause seawater to rise and move inland, inundating low-lying coastal areas. Only when there are human uses in these temporary flood storage areas (i.e., floodplains or coastal lands) does flooding become a management problem. Figure 17 shows generalized flood-prone areas in the SWFWMD. As used in this Plan, the term "flood-prone areas" means those land areas subject to periodic inundation, whether or not adjacent to a water body. The term is used generally and is not intended to identify specific locations or return frequencies.

The simplest and most effective approach to flood protection to avoid incompatible land uses within flood-prone areas and to ensure that land development does not alter natural patterns of water movement and storage. This preventative approach is commonly referred to as the "non-structural" method, because the emphasis is placed on harmonizing growth and development with the natural environment. Conversely, a "structural"

approach involves the intentional alteration of natural surface water systems through construction of facilities such as ditches, canals, dams and control structures, to ensure that formerly flood-prone areas are to some degree safe from future inundation. This is often a long, costly process with significant environmental impacts, including the alteration of natural aquatic and terrestrial habitats and the acceleration of stormwater pollution of water bodies.

This component of the District Water Management Plan (Plan) examines the flood protection responsibilities of the SWFWMD. These responsibilities are divided into two categories: flood protection facilities and flood-prone areas that correspond essentially to the structural and non-structural approaches, respectively. The District's overall flood protection goal is first stated, then, in the sections that follow, current resource management initiatives are described, followed by a presentation of flood protection issues, policies and strategies.

Flood Protection Goal: Minimize the potential for damage from floods by protecting and restoring the natural water storage and conveyance functions of flood-prone areas, giving preference wherever possible to non-structural surface water management methods.

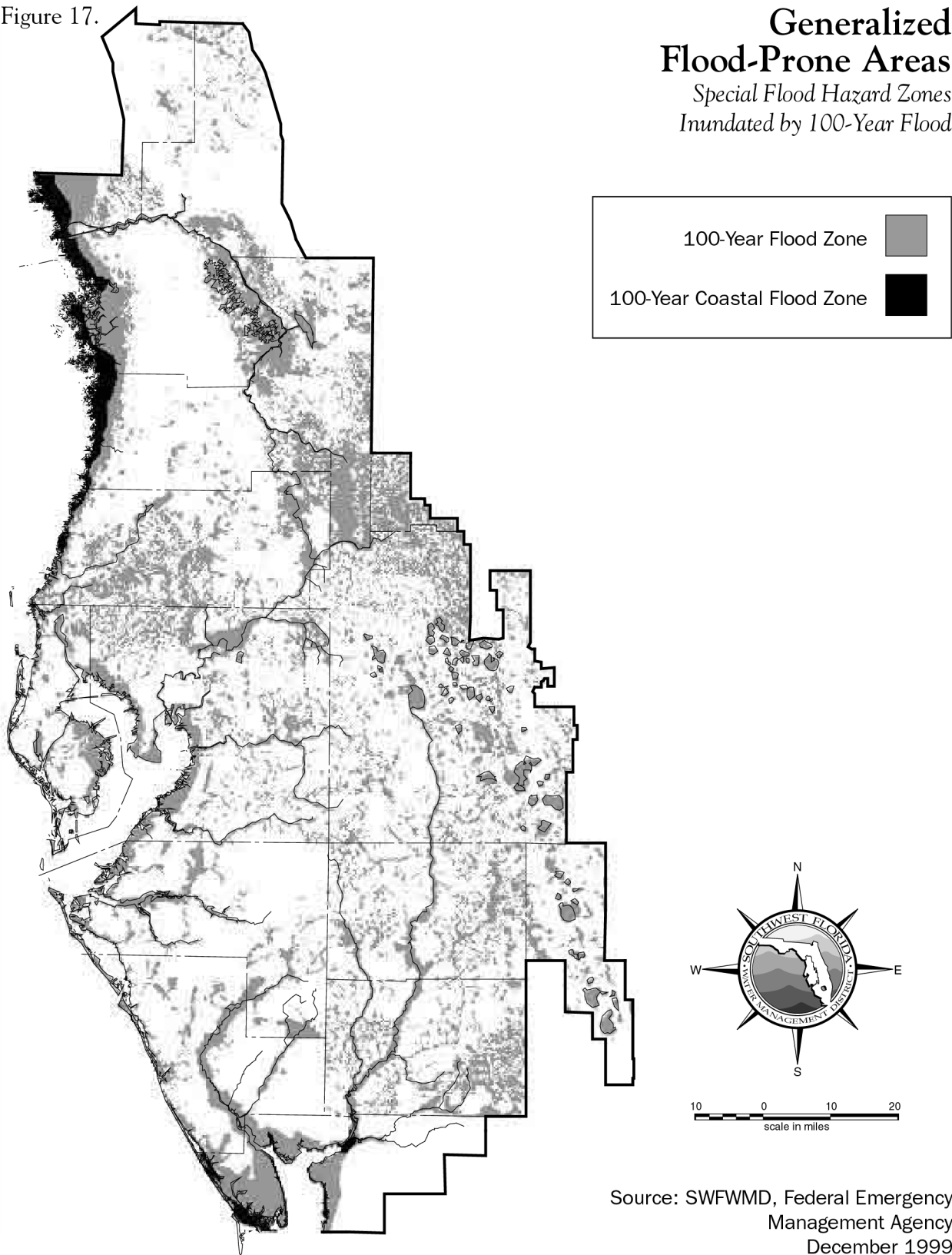
Section 1. Resource Assessment

The "El Niño" floods during the winter of 1997-98 underscored the importance of preparation and prevention in achieving flood protection. Coming during the dry season, these events were unexpected and forced State, regional and local officials to mobilize resources to respond to the resulting flooding. The experience gained during these events will enable the District to be better prepared in the future to: respond to citizen and local government emergency requests; perform overflights and on-the-ground

Figure 17.

Generalized Flood-Prone Areas

*Special Flood Hazard Zones
Inundated by 100-Year Flood*



flood documentation; work effectively with state and federal governments in providing emergency assistance, communicating with the public and local officials, and documenting needs and expenditures for potential reimbursement from disaster relief funding.

Following the El Niño events, the District has begun a Flood Protection Coordination Initiative (described below) to work with local governments in the region to establish comprehensive flood protection partnerships. Along with identifying specific flood protection needs, both preventive and remedial, this program will lay the groundwork for improved coordination in all aspects of flood prevention, flood management and flood response.

1-1 Current Programs

The major existing flood protection initiatives of the District are described in this section. The programs are categorized in two subsections: “Facilities” and “Flood-prone Areas,” which, as noted above, essentially correspond to the structural and non-structural approaches to flood protection. Some programs, such as data collection and regulation, do not fit neatly into these categories, and are described as appropriate to both.

1-1.1 Facilities Programs

1. Data Collection

Data collection related to flood protection includes the regular assembly of information on such key indicators as rainfall, water levels and stream flows. The District’s capability to assist in flood control has continued to improve during the past several years with the expansion of the District’s Supervisory Control And Data Acquisition (SCADA) system. This computerized data collection system comprises the cornerstone of the District’s flood data collection, through a Districtwide network of more than 117 real time and near-real time

water level and rainfall data collection stations. The term “real time” means that the data are available within minutes of being measured, whereas near-real time means that the data are reported within four hours of being measured.

The SCADA system provides an early warning mechanism that allows flood problems to be anticipated by observing water level and rainfall trends. This information, which is automatically transmitted to District headquarters by radio, allows the District to operate its structures much more effectively during rainfall events and provides limited capability to remotely operate gates at water control structures. The system was designed with several fail-safe components to keep it operational during major storm events, when traditional communication lines may be inoperable.

Other agencies, including the Southeast River Forecasting Center, the National Weather Service, and the Army Corps of Engineers, have been given the ability to dial into the SCADA system to access these data for use in early warning and emergency operations efforts. Additional surface water sites are being instrumented every year, mostly in support of the District’s Structure Operations and Engineering sections. In addition, other public agencies and a few private companies are instrumenting sites which will be integrated with the District’s SCADA system.

The amount and detail of rainfall and stream level data now available for use by modelers has likewise grown. In addition to the 53 real time rainfall sites, the District operates 27 near-real time rainfall sites, and 40 other recording rainfall gauges. These instruments record rainfall accumulations at least once per hour, and in many cases even more frequently. More recording rain gauges are being installed to develop a dense, Districtwide network of precipitation data.

The USGS monitors flow on all major rivers and streams in west-central Florida. During the past

two years, mostly through a cooperatively funded program with the District, the USGS has instrumented 60 sites on these rivers and streams with data collection instruments that have the capability to relay data in near-real time by satellite. These data are posted on the USGS' Internet Web site, increasing accessibility for the many entities who use this information.

2. Facility Operation and Maintenance

Only a few of the District's structures and facilities are designed for flood control. District facilities can be classified in three main categories, including basic water control structures, salinity barriers and flood control structures. These facilities are inventoried and described in the District's Public Facilities Report (SWFWMD, 1991) and shown in Figure 18. The Report, which is scheduled for an update in 1999, describes the location, purpose and operation of each District facility.

❖ **Water Control Structures.** The majority of District structures are basic water control structures used to maintain water levels in lakes. The capability of these structures to reduce flooding is quickly exceeded during storm events, due to the limitations of drainage systems (ditches, canals) external to the structure. Many of these water control structures were built years ago by other entities and were not designed to handle the amount of flow from current, more highly developed conditions. The District operates the structures only, while local governments are typically responsible for maintenance of the many drainage culverts and ditches located upstream and downstream of the structures. Inadequate or improper maintenance of these culverts and ditches can often inhibit water flows, allowing flooding to occur during storm events, even when a control structure is fully open.

❖ **Salinity Barriers.** Salinity barriers in the District include those located on Channels "A" and "G" in western Hillsborough County, on the

Lake Tarpon Outfall Canal in Pinellas County, and on Alligator Creek in Charlotte County. Similar to the basic water control structure, these are often confused with flood control structures. Their purpose, however, is to prevent salt water from flowing into freshwater channels. The gates on Channels "A" and "G" operate automatically as tides rise to prevent salt water from moving upstream. During flood events, these gates can be opened in an attempt to provide for more storage and conveyance capacity in the channels. Opening the gates and letting the channels flow unrestricted does not always help during flood events, since the force of tides can retard or even neutralize the channel flow during major events such as hurricanes.

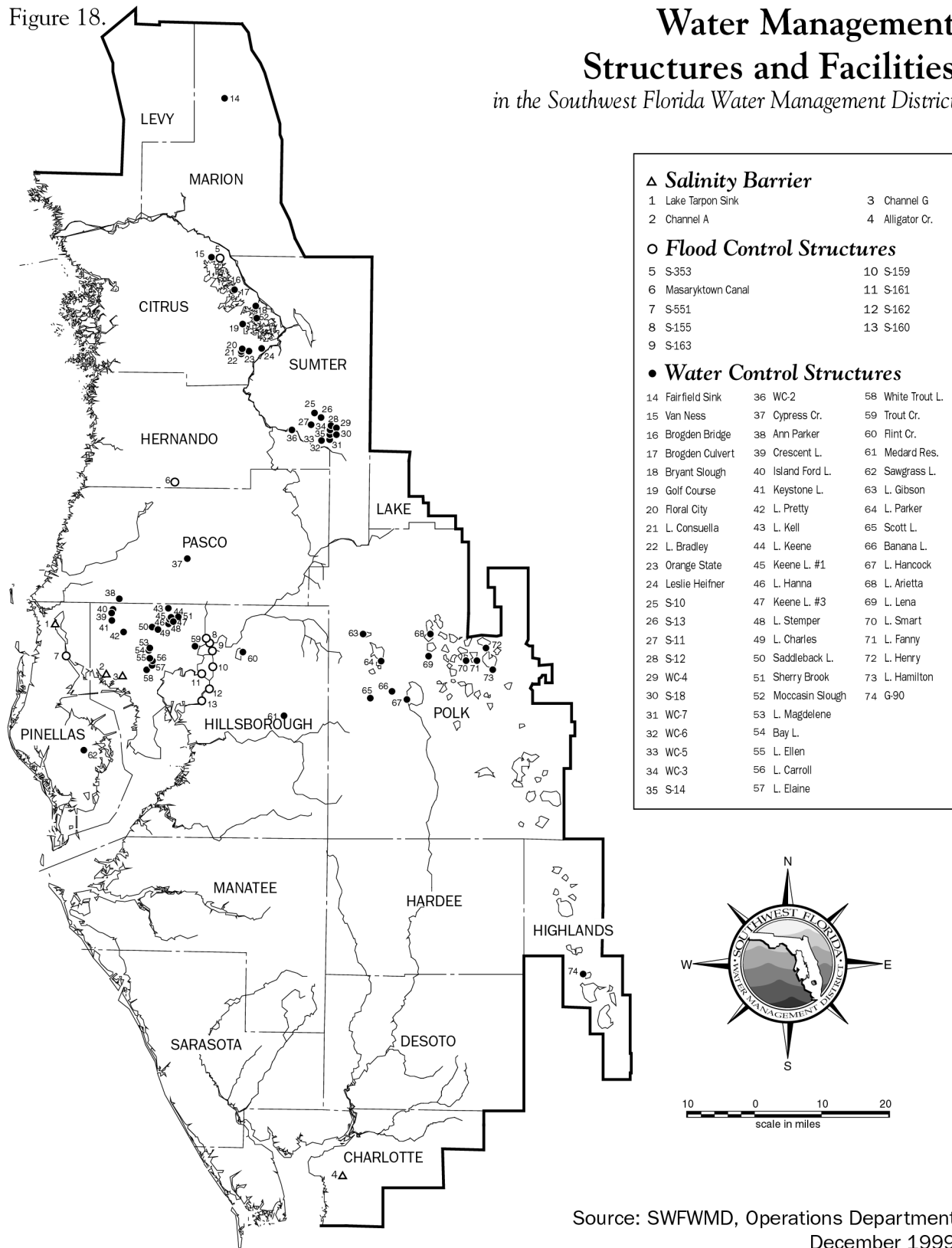
❖ **Flood Control Structures.** Most of the flood control facilities owned, operated, and/or maintained by the District originated with the Four River Basins Project. The largest and most significant of these flood control facilities are those associated with the Tampa Bypass Canal (TBC) which can be used to divert flood waters from the Hillsborough River before it flows through the cities of Tampa and Temple Terrace. Water diverted from the river is conveyed through a series of canals and discharged into McKay Bay, sparing large areas of the two cities from potentially disastrous flooding. Designed and built mostly in the 1960s and 1970s, the TBC also protects the Rowlett Dam and reservoir on the Hillsborough River, which provides the primary source of drinking water for the City of Tampa.

Other District flood control facilities include the Lake Tarpon Outfall Canal in Pinellas County, the Masaryktown Canal in Pasco and Hernando counties, and Structure 353 on the Tsala Apopka system in Citrus County. **It is important to note that while these flood protection facilities can lessen the potential for human injury and property damage from flood events, they cannot prevent all flooding or related damages.**

Figure 18.

Water Management Structures and Facilities

in the Southwest Florida Water Management District



Source: SWFWMD, Operations Department
December 1999

3. Facility Inspections

The District has a program to regularly assess the condition of its water control and flood control structures. Most structures receive routine operational inspections and basic structural inspections, performed by District field personnel. Additionally, major structures receive detailed inspections by District staff and an independent, professional engineer. These inspections include examination of submerged parts of the structures by divers. This inspection program ensures that District structures are maintained in a state of readiness.

4. Emergency Management Plan

The District's Emergency Management Plan provides a detailed plan of actions necessary to effectively mobilize resources and conduct emergency operations in anticipation of, response to, and recovery from disasters. The Plan is further intended to supplement the State of Florida Comprehensive Emergency Management Plan with respect to enhanced federal, state and local coordination during disasters. The Plan is tested annually through District participation in a statewide emergency operations exercise.

5. Surface Water Permitting

The District's surface water management permitting program, implemented through Chapters 40D-4 (Environmental Resource Permitting) 40, 400 and 40D-6 (Works of the District), F.A.C., includes several criteria specific to flood protection as it relates to the construction or alteration of a surface water management system. Current rules require that a District permitted system not cause adverse flooding impacts on-site or to receiving waters, adjacent lands, or other off-site lands. The effect of these rules is to ensure that the flood protection that exists off-site prior to any regulated activity is maintained, up to the 25-year flood event, and that on-site flood protection is considered during development.

Because most surface water management activities were not regulated by the District until the 1980s, many local flooding problems still occur in older developments.

6. Flood Protection Coordination Initiative

The Flood Protection Coordination Initiative (FPCI) is a new effort by the District to develop a comprehensive, cooperative flood protection strategy for each county in the District. This effort is a component of the CWM Initiative. The FPCI will involve an analysis of each basin (or watershed) within a county and a joint determination by the District and the county of the preventive and remedial actions needed for flood protection over a continuing 5-year horizon.

The FPCI will include development of an integrated work program with each county, identifying the responsibilities and commitments of the parties. The District will also consider a similar approach with interested municipalities. An implementation program will spell out the timing, costs and priorities for specific projects. The District will help fund priority projects through its Cooperative Funding program. Local governments must ensure that adequate land use policies and standards are in place to avoid the creation of new flooding problems caused by inappropriately sited or designed developments. The District is currently working with Hernando County as a pilot project for the FPCI.

In addition to coordination with local governments, the FPCI has resulted in closer coordination with the Federal Emergency Management Agency (FEMA). One outgrowth of this enhanced coordination is the District's assistance in updating federal flood maps through FEMA's Cooperating Technical Community (CTC) initiative. The FEMA, through the CTC initiative, seeks to partner with local governments and other entities to develop more accurate flood maps and identify opportunities for hazard mitigation to reduce the potential for future flood-related impacts.

7. Aquatic Plant Management

The District conducts aquatic plant management operations on flood control systems to maintain flow capacity, to ensure the proper operation of water control structures and to protect ditch bank and rip rap areas. Unmanaged growth of aquatic plants reduces the conveyance capacity of flood control systems and shifting mats of vegetation can block water control structures. Brush and tree species growing on canal banks or areas which are protected by rip rap can damage these areas causing erosion and scouring during high flow periods. Vegetation jams can also form on bridges, effectively creating dams, and resulting in upstream flooding and damage to the bridge. Jams may occur on bridges on flood control systems such as the TBC, as well as on rivers such as the Manatee, Peace or Withlacoochee. Aquatic plant management also plays an important role in Natural Systems protection and is discussed more fully in that section.

1-1.2 Flood-Prone Areas Programs

1. Floodplain Analysis

Prior to creation of the National Flood Insurance Program, the District was actively involved in floodplain identification. Almost all major rivers, streams and lakes in the District were analyzed, mostly in the 1970s, and flood levels identified for various return frequencies (i.e., 2.33, 10, 25, and 100-year floods). This information can be useful to local governments in managing growth and development in flood-prone areas. Many of these flood studies were published and some included maps.

Chapter 62-40, F.A.C., requires the water management districts to address floodplain protection as a component of their water management responsibilities. To further its flood protection assistance efforts, the District has initiated the FPCI (see above) to enhance its ongoing work with local governments in identifying areas that require floodplain mapping

or remapping. This work is being coordinated with the FEMA, through its CTC initiative, and will result in the updating of that agency's Flood Insurance Rate Maps (FIRM). The District's floodplain mapping schedule is based on an annual assessment of priorities as established by CWM Team recommendations, including consideration of proposals to the Cooperative Funding request program.

2. Comprehensive Watershed Management Initiative

This program is more fully described in the Watershed Management Chapter of this Plan. With regard to flood protection, it provides a comprehensive analysis of surface water hydrology and flooding issues for each of 11 major watersheds in the District. At a broad scale, CWM analyses help to identify existing problems and potential future problems areas through use of GIS technology and local involvement, and develops cross-disciplinary solutions.

3. Aerial Topographic Mapping

The Aerial Topographic Mapping Program supports the mapping of land surface elevations throughout the District. The program began in the early 1970s and has been funded primarily by the Basin Boards. To date, approximately 6,500 of the District's 9,700 square mile land mass has been mapped. The topographic data collected under this program provides the primary data source for stormwater master plans and floodplain analyses. In addition to their importance for in-house and cooperative projects, approximately 28,000 maps are distributed to governmental agencies, private firms and citizens each year.

4. Lake Levels Program/Minimum Flows and Levels

The District's Lake Levels Program, established in the 1970s, has provided adopted management levels for over 400 lakes throughout the District.

Flood stage information from this program is used by many local governments in regulating development adjacent to lakes, as well as by the District in public flood protection education efforts. Information relative to flood protection from the Lake Levels Program is contained in the District publication, "Flood-Stage Frequency Relations for Selected Lakes." This report, a compilation of flood level information for all lakes for which it is available, has been distributed to numerous local governments and is available from the District upon request. Recently, the Lake Levels Program has merged with the District's Minimum Flows and Levels (MFLs) Program in an effort to expand and enhance the management and protection of surface and groundwater resources. A full discussion of both of these programs is included in the Natural Systems section.

5. Land Acquisition

The District acquires and protects lands for a variety of water management purposes using funding from state programs, the most prominent being the Save Our Rivers (SOR) and Preservation 2000 (P2000) programs. With the latter scheduled to expire, the Florida Forever program was enacted by the 1999 Legislature and will take effect July 1, 2001. The majority of the lands purchased by the District contain important natural flood storage areas. By protecting these areas, the District ensures that they will not be developed, putting people at risk on the sites themselves and in downstream locations where flood levels may be made higher by the loss of natural water storage areas.

Lands are purchased outright (fee simple acquisition) or, in some cases, on a "less-than-fee" basis, meaning that only some of the total bundle of ownership rights are acquired. District less-than-fee acquisitions typically are conservation easements that limit the allowable uses of the property to low-intensity agriculture and silviculture. Limits also are placed on subdivision of ownership and on construction of homes and

other structures. Less-than-fee acquisitions are often particularly useful for flood protection purposes because they ensure that residential and other development will not occur in flood-prone areas, they cost less than fee simple acquisitions, and the District does not bear ongoing land management costs (the landowner typically continues management of the property). Local governments benefit as well since such lands remain on the tax rolls.

Even lands originally purchased for the Four River Basins project (see 1-1.1 Facilities Programs) are now preserved for natural flood control purposes. As an example, the District owns some 100,000 acres in the Green Swamp in Central Florida that naturally detain a large volume of surface water prior to discharging to the Withlacoochee and Hillsborough rivers. Through this program, over 300,000 acres of lands are protected by the District for all water management purposes.

6. Surface Water Permitting

This program is described in 1-1.1 Facilities Programs above.

7. Technical Assistance

The District provides assistance in a number of ways to local governments, special districts and other entities to help reduce the probability of, and minimize the impacts of damaging floods. This program includes comprehensive planning assistance, provision of aerial maps and floodplain maps, cooperative funding, development review and other efforts. In addition, the District helps local governments to identify District activities that can be used to earn points under the Community Rating System of the National Flood Insurance Program. As more points are accumulated, residents within the local government receive progressively larger discounts on flood insurance premiums. The FPCI (see above) will formalize some of these technical assistance efforts with local governments.

8. Communications and Outreach

The District provides a variety of flood protection information and educational resources to the public. These resources include the District's "Floodplain Facts" brochure, which provides basic information on floodplains and flood-prone areas, the risks associated with living in such areas, and where to turn for additional information. A video version of the "Floodplain Facts" brochure is also available for broadcast on community television channels or for use by local governments in their community education efforts. Other information resources include brochures on wetland flood protection/water quality functions, stormwater pond maintenance and enhancement, and District surface water management permitting.

Section 2. Issues Assessment

The District is constantly striving to advance its knowledge of hydrologic systems and our influences on them. Through enhanced knowledge, the District can move forward in improving the effectiveness and efficiency of its resource management efforts. District efforts, such as the previously described FPCI, are prime examples of this improvement process. One of the main purposes of this Plan is to provide a mechanism whereby the District can identify areas for potential improvement and develop specific recommendations to achieve these improvements.

Flood Protection issues addressed in this Plan include:

1. Coping with Growth: Preventing New Flooding Problems

Components of this issue include:

- a. Coordinated Strategies/Role Clarification: Local Governments, the State of Florida and the Federal Government

- b. Floodplain Mapping and Information Sharing
- c. Long-Term Maintenance of Facilities
- d. Determining the Adequacy of Surface Water Regulations

2. Remediating Existing Problems

Components of this issue include:

- a. Setting Priorities for Remedial Actions
- b. Planning and Budgeting for District Facility Capital Improvements
- c. Dam Safety

Action plans, including specific tasks, for each of the following issues, are included in the section on implementation strategies.

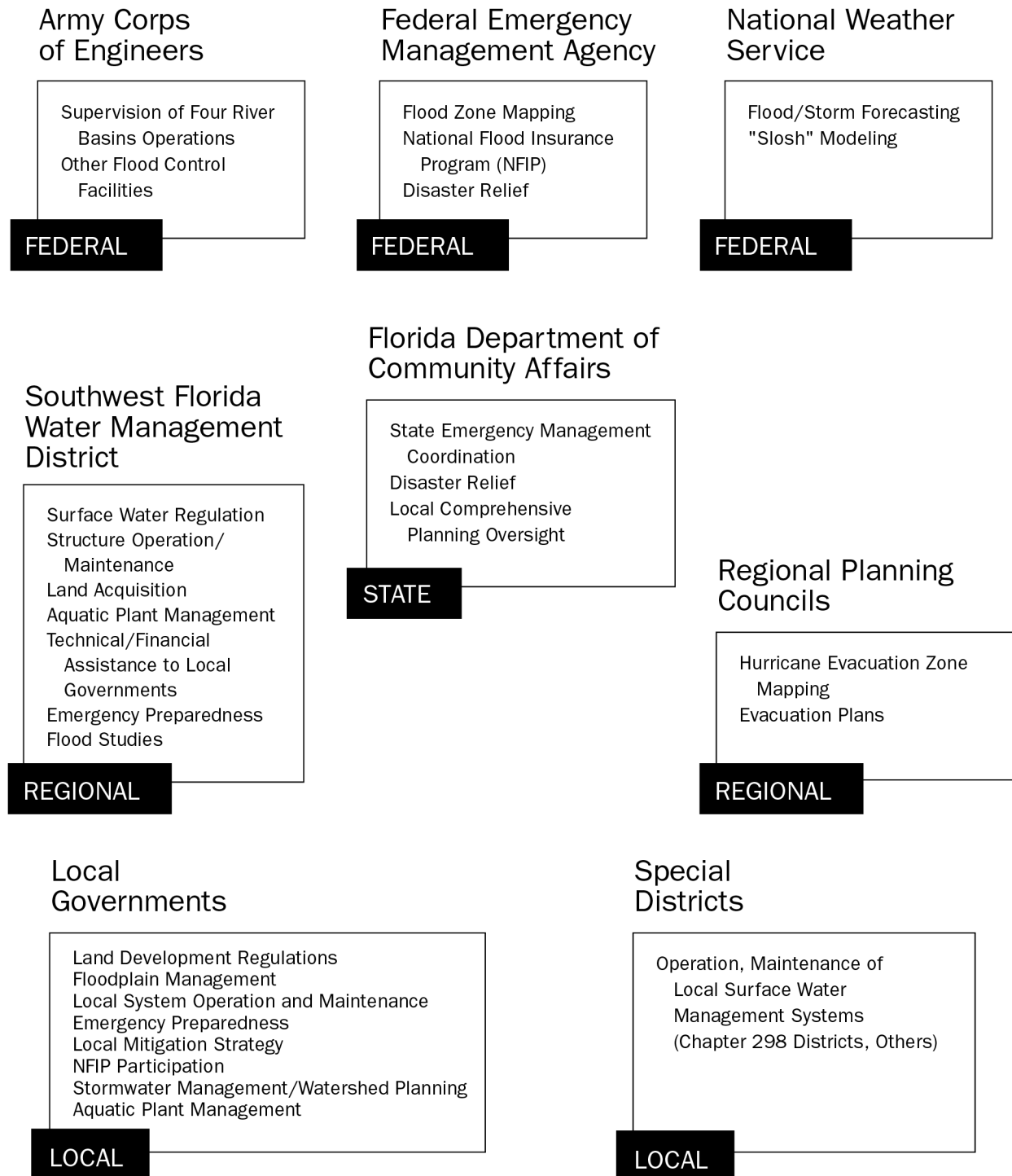
2-1 Coping With Growth: Preventing New Flooding Problems

As noted in the introduction, flooding is a natural phenomenon; it is a response to rainfall events that exceed the capacity of natural drainage systems. In west-central Florida, with its flat topography, gentle stream gradients, and sometimes intense rainfall events, flooding is a common occurrence at low points in the landscape. With growth and development proceeding at a rapid rate, it is imperative that such growth be accommodated without creating new flooding problems, either by not building in flood-prone areas or not changing the hydrology of local drainage systems.

Because local governments have the exclusive authority over land-use decisions, and multiple federal, state, and regional agencies have a role to play in flood protection, (see Figure 19), **coordinated strategies and role clarification** will be required to prevent additional flooding. The District is working closely with local governments through its Flood Protection Coordination Initiative to plan appropriately for growth and address existing flood problem areas. **Floodplain mapping, information sharing, and**

Figure 19.

Agencies Responsible for Flood Protection in Southwest Florida



Source: SWFWMD, Planning Department
December 1999

detailed hydrologic analyses are among the tools used by the District in this program that can continually be refined.

The District must also ensure that its own facilities and regulatory programs are integrated into a comprehensive strategy for flood protection. The District must provide for **long-term maintenance of its facilities**, so that they will function reliably during significant storm events. In addition, the District must continually evaluate the **adequacy of its surface water regulations**. Changing conditions, brought on by new development, drainage alterations, lack of maintenance, or other factors, may warrant the modification of permitting standards in some locations to ensure that permitted systems achieve the necessary level of flood protection.

2-2 Remediating Existing Problems

While much of the District's focus is appropriately on prevention, existing flood problem areas can be addressed in numerous ways. The District is working with local governments through the Flood Protection Coordination Initiative to **set priorities for remedial actions** to address existing problems. Such actions may include conveyance improvements, creation of flood storage, relocation of structures out of flood-prone areas, or other initiatives. Recognizing that many of its flood control and water control structures and facilities are aging, the District is investigating alternatives for **planning and budgeting for capital improvements** for such facilities. Budgetary mechanisms such as sinking funds are being considered, along with contractual arrangements for facility maintenance and repairs.

Dam safety was an issue in the 1994 Plan and still requires attention by the District in 1999. Although the DEP is the agency primarily responsible for safety issues associated with dams, structures and impoundments, the District can play an important role in assisting

DEP. The District monitors facilities constructed with District permits and can work with local governments, industry, the agricultural community and landowners to ensure that other facilities do not pose a safety problem. DEP is currently conducting a statewide inventory of all facilities that meet the federal definition of a "dam" (essentially any structure that impounds water to a depth of six feet), an effort that should be supported by the District.

Section 3. Water Management Policies

The following policies provide long-range guidance to the District in fulfilling its statutorily based flood protection responsibilities. These policies express the position or strategy of the District that will be applied consistently in response to various resource management issues. In this case, "District" refers to the Governing Board and Basin Boards, since both make funding and other decisions in the best interest of the resource.

These policies may be implemented only to the extent that financial, staff or other necessary resources are available, pursuant to the budgetary actions of the Governing Board and Basin Boards. These policies do not create any regulatory authority and may require rule making as one component of their implementation. The policies contained within the Plan shall be reasonably applied where they are environmentally, technically and economically feasible. These policies shall be construed and applied as a whole, in recognition of the policies within all areas of responsibility within the Plan, and no specific policy shall be construed or applied in isolation from the other policies in the Plan.

3-1 Facilities Policies

It is the policy of the District to:

1. Ensure public comprehension of District flood protection responsibilities, including the purpose and function of water management and flood control structures, the level of flood protection provided, and the limits of District flood protection capabilities.
2. Ensure that all structural and non-structural components of the District's flood protection system are operated and maintained to maximize environmental benefits and minimize adverse impacts on water supply and water quality, while maintaining flood protection.
3. Formulate watershed strategies defining appropriate future flood solutions and maintenance of existing facilities as part of the development of a comprehensive approach to watershed management.
4. Periodically evaluate District flood control facilities, including their capacity to accommodate design conditions and their performance under a worst-case scenario.
5. Optimize surface water management technology in stormwater management systems to meet the varying requirements of flood control and water quality standards, water conservation and protection of natural systems.
6. To ensure public safety, through coordination with federal, state and local agencies to develop criteria for surface water impoundment, dam inspection and remediation.
7. Periodically evaluate the effectiveness of surface water management regulations, including compliance and enforcement.
8. Improve coordination with local governments for the maintenance of conveyance systems that impact District water management activities.
9. Where possible, prevent damage from floods, soil erosion, excessive drainage and

sedimentation in all activities permitted, funded or undertaken by the District.

10. Develop and maintain an emergency operations plan to guide District actions before, during, and after flood events and other disasters.
11. Furnish technical assistance, data, and information to local, regional, state and federal officials before, during and after flooding emergencies.
12. Provide technical assistance to drainage authorities (e.g., the nine Chapter 298 Drainage Districts in the SWFWMD) to improve their effectiveness and to encourage state-of-the-art water management.
13. Strive for consistency of rules and criteria for stormwater management between the District and other entities.

3-2 Flood-prone Area Policies

It is the policy of the District to:

1. Apply a comprehensive, watershed-based approach to surface water management, including formal coordinating mechanisms, to resolve conflicts among the District's flood protection, water quality, natural systems and water supply responsibilities.
2. Encourage and promote non-structural techniques and solutions as the primary approach to flood control and water resource problems, including consideration of non-structural alternatives when structural works are proposed.
3. Seek to prevent interference with the natural movement of surface waters.
4. Consider the cumulative effects of past, present and future surface water management activities.
5. Protect the functions of flood-prone areas and related natural systems and discourage channelization or other alterations of natural surface water regimes.
6. Work with appropriate federal and state agencies, the regional planning councils and

local governments to develop a floodplain management program to protect the natural storage, conveyance, recharge, water quality and habitat functions of flood-prone areas.

7. Discourage actions in flood-prone areas which promote growth or adversely affect natural flood-prone area functions.
8. Encourage local governments to require, where feasible, that all new costs for flood protection in flood-prone areas be borne as a cost of development.
9. Encourage and assist in the development of local and regional stormwater utilities as funding sources to correct surface water management deficiencies.
10. Prevent flood damage through the identification, development and maintenance of accurate information on the extent of floodplains and flood-prone areas in the District, including coordination with local and other governments.
11. Coordinate and participate with the Army Corps of Engineers, FEMA, the State Department of Community Affairs (DCA), local governments and other appropriate agencies in flood remediation projects, including but not limited to, elevating or acquiring structures and facilities subject to repeated losses in flood-prone areas.

Section 4. Implementation Strategies

The following implementation strategies are the means through which the District responds to the Flood Protection issues identified in this section of the Plan. As appropriate, the format includes tasks, schedules and responsible parties. It is important to remember that many of the District's existing programs serve as the foundation for responsive strategies. For example, the Environmental Resource Permitting and land acquisition programs are integral parts of the District's preventive approach to flood protection.

The tasks outlined below are organized under the two primary flood protection issues: prevention and remediation. In practice, many of the tasks and initiatives listed overlap these two issues.

4-1 Coping With Growth: Preventing New Flooding Problems

Task 1: Implement the Flood Protection Coordination Initiative (FPCI)

- a. Implement FPCI with selected priority counties by 2004.
- b. Pilot FPCI with Hernando County to be completed by the end of 2000.
- c. Establish priorities for new aerial topographic mapping and remapping in counties.
- d. Coordinate with counties and the FEMA to update FIRMs in priority areas as part of the CTC initiative.
- e. Conduct detailed hydrologic studies in highest priority basins to determine flood elevations for multiple return frequencies and provide the basis for further analysis.
- f. Seek opportunities to assist local governments in reducing flooding risks, earning points under FEMA's Community Rating System and reducing flood insurance premiums.
- g. Cooperate with the DCA in their "Breaking the Cycle" initiative. As part of this effort, participate on local government mitigation strategy committees to the extent possible.

Responsible Entity: District Resource Management, Planning, Resource Data and other departments; local governments.

Task 2: Provide technical assistance and oversight for Chapter 298 water control districts on an ongoing basis.

- a. Assist water control districts with information and technical assistance on statutorily required water control plan development.

- b. Review these districts' water control plans, which must be submitted by October 2000 (Section 298.225, F.S.). The District's review period is 90 days.
- c. Review amendments to water control plans resulting from required plan evaluations every five years.

Responsible Entity: District Planning and Resource Management departments; 298 districts.

Task 3: Improve data sharing efforts with local governments, state and federal agencies and other appropriate parties.

- a. Continue SCADA system expansion and enhancement, and achieve access to SCADA data via the World Wide Web by October 2000.
- b. Expand availability of District GIS coverages and other data through the SWFWMD Web site.

Responsible Entity: District Resource Data Department.

Task 4: Identify lands of special importance for flood protection and include them in the District's Florida Forever Work Plan by January 2001.

- a. Utilize the CWM Initiative, the FPCI, and the land resource evaluation process to identify individual projects.
- b. Coordinate acquisitions with local governments and utilize less-than-fee approach where appropriate.

Responsible Entity: District Land Resources and Resource Management departments, CWM teams, local governments.

Task 5: Update the District Facilities Report (required by Section 189.415, F.S.), by the end of 2000, to ensure accurate information on the location, capacity and function of all District flood control and water control structures.

Responsible Entity: District Operations Department.

Task 6: Evaluate District surface water management regulations for adequacy in basins with special potential for future flooding on a priority basis. This will be accomplished primarily through the FPCI and the CWM Initiative.

Responsible Entity: District Resource Management and Regulation departments, and CWM teams.

Task 7: Maintain District's emergency response readiness.

- a. Annually evaluate the District's Emergency Management Plan, and update as needed.
- b. Participate in annual emergency preparedness exercise sponsored by the Florida Department of Community Affairs' Division of Emergency Management.

Responsible Entity: District Operations Department.

4-2 Remediating Existing Flood Problems

Task 1: Utilize the Cooperative Funding program to annually provide matching funds for priority remedial flood projects, as identified by the CWM Initiative and contained in the District's Five-Year Basin plans and the local governments' five-year capital improvement plans. Priorities will be identified cooperatively with local governments through the FPCI.

Responsible Entity: Basin Boards, District staff and local governments.

Task 2: Establish a budgetary mechanism, such as a sinking fund, and any other necessary arrangements to ensure funding is available when needed for maintenance and repair of District flood control and water control structures for inclusion in the fiscal year 2001 budget.

Responsible Entity: District Operations and Finance departments.

Task 3: Evaluate District lands on an ongoing basis for opportunities to enhance flood storage while protecting natural character and other beneficial uses, as part of the overall flood protection initiative.

Responsible Entity: District Resource Management Department (through FPCI), CWM teams and Land Resources Department.

Task 4: Establish procedures for the formation of flood response teams in each District Regulation Department by 2001. The teams, as they successfully did in the “El Niño” floods in 1997-98, will work with citizens, landowners, businesses, local governments and others to help resolve site-specific flooding issues in the aftermath of major flood events.

Responsible Entity: District Regulation and Resource Management departments.

Task 5: Establish internal procedures for post-event overflights and on the ground documentation of flood events by 2002 to ensure opportunities for data collection are not lost.

Responsible Entity: District Resource Data, Resource Management and Finance departments.

Task 6: Coordinate with the Florida DEP on an ongoing basis to ensure establishment of an adequate program of inspection, monitoring, and maintenance of dams, structures and impoundments.

Responsible Entity: Florida DEP, District Operations Department.

Section 5. Performance Measures

The District has an existing Effectiveness Measures initiative. The purpose of this effort is to develop methods to measure accomplishment of the District’s mission and goals, provide regular trend information to decision makers and create public awareness of District accountability. In effect, this process develops a picture of the “State of the Resource” to assure adequate water supply, protection of water quality, flood protection and preservation of natural systems. It is discussed in greater detail in the Management Services section.

In addition, the District has been working with the EOG and the DEP to develop “core” performance measures for both budgeting and water management planning purposes. These are measures that all the districts have in common, with each district free to have additional measures as needed. Measures have been developed for each of the four major areas of responsibility (water supply, flood protection, water quality and natural systems), as well as for all four areas collectively. The entire set of measures developed is shown in the section of Water Management Goals and Policies, while those noted below are for Flood Protection only. Figure 20 provides a graphic depiction of one core measure.

5-1 Flood Protection and Floodplain Management Measures

Objective 1: Minimize flood-related damage.

Objective 2: Promote non-structural approaches to achieve flood protection and to protect and restore the natural features and functions of the 100-year floodplain.

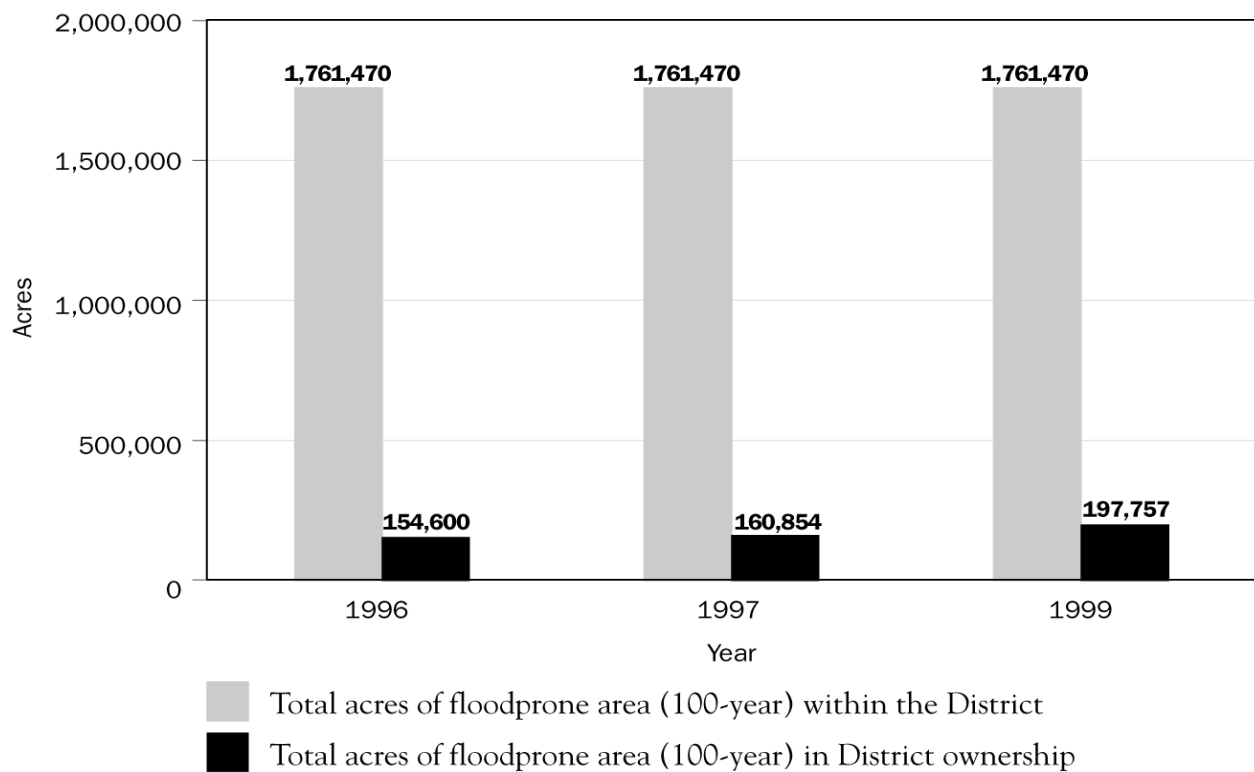
- a. Acres identified for acquisition to minimize damage from flooding and the percentage of those acres acquired.

Figure 20.

Floodprone Area (100-Year) in District Ownership

Flood damage occurs when human activity creates something in these areas that can be damaged. Public acquisition of floodplains prevents development and other human encroachments, thereby preserving the beneficial environmental floodplain functions and reducing the damages from human occupancy of hazardous areas. As of 1999, more than 11 percent of the 100-Year Floodprone area in the District has been acquired.

This indicator will be revised in the future to reflect all public ownership in the SWFWMD to better mirror the statewide indicator.



Note: Figure not available for 1998 since no DWMP Annual Progress Report was produced in 1999.

Source: FEMA and SWFWMD, Planning Department,
December 1999

Part D. Water Quality

Clean, uncontaminated water is essential for most life on Earth. In areas with high population growth, urbanization, agriculture, industry and other activities, protecting and maintaining water quality necessary for the health and life of all species will become increasingly challenging and expensive. Water quality management in the SWFWMD can often be complicated by significant interactions between ground and surface waters. In large portions of the District, there is no reliable separation between ground and surface waters; contaminants in one system frequently find their way into another. In addition, water does not respect jurisdictional boundaries and must be dealt with regionally. Examples of these hydrologic interconnections include:

- ❖ Recent findings of elevated nitrate levels in coastal springs from Citrus to Hillsborough counties resulting from residential and other forms of development, increasing use of fertilizers (primarily on turf grass) and long-term agricultural and waste management practices;
- ❖ As wells pump water from the District's coastal and southern groundwater areas, mineralized water is pulled into freshwater supplies; and
- ❖ Prior to the introduction of stormwater regulation and management practices, drainage design practices contributed to both ground and surface water contamination.

The District is involved in maintaining and improving the quality of waters within its jurisdiction. Surface and groundwater management programs, issues, policies and strategies are presented as a whole in order to recognize the inter-relatedness between surface and groundwater resources. Other agencies with water quality responsibilities are shown in

Figure 21, which illustrates water quality management is truly a shared function.

Water Quality Goal: Protect water quality by preventing further degradation of the water resource and enhancing water quality where appropriate.

Section 1. Resource Assessment

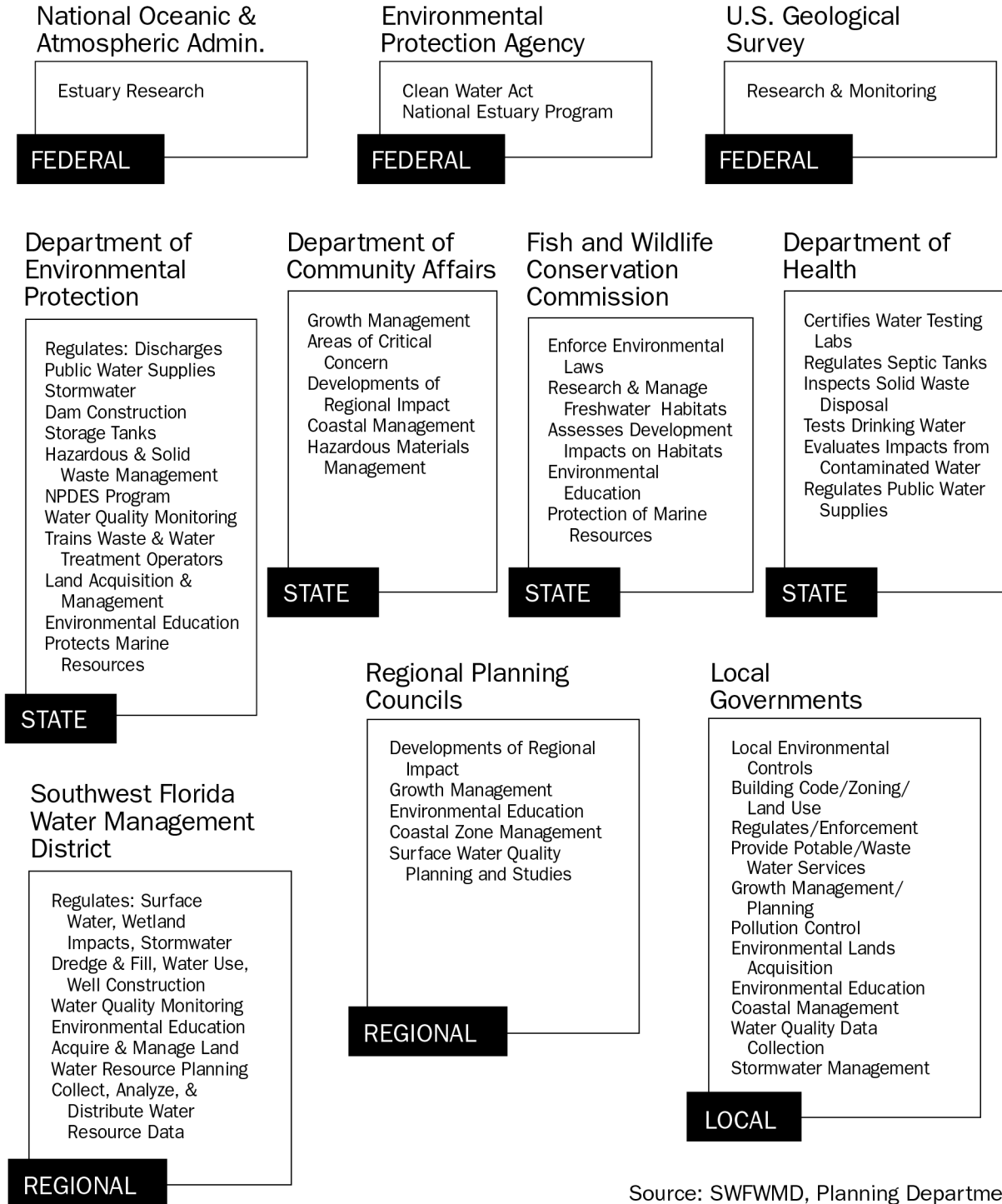
In the last several decades the District has experienced significant population growth. One result of this growth has been increased discharge of manmade pollutants to surface water bodies as well as infiltration of various contaminants into the groundwater system. This is typically followed by a decline in the value of the natural habitat. Increasing public awareness of the degradation of many lakes and rivers in the state has fostered a strong public desire to restore these water bodies and preserve those that are still in good shape.

The DEP's 1984 delegation of responsibilities under Chapter 62-25, F.A.C., was the beginning of the District's involvement with surface water quality management. These regulations provided design criteria for stormwater systems to lessen water quality degradation from stormwater runoff. This program has since been replaced with a comprehensive Environmental Resource Permit (ERP) Rule. In 1987, the District began providing technical assistance to cooperatively address water quality issues of local governments at their request. For example, requests by the City of St. Petersburg and Polk County to research the water quality impacts of stormwater on Lakes Maggiore and Mariana, respectively, were the impetus for diagnostic assessments of these lakes that are leading to corrective actions.

The legislative inception of the Surface Water Improvement and Management (SWIM) program in 1987 demanded a broader District approach to surface water quality for selected,

Figure 21.

Agencies Responsible for Water Quality Management in Southwest Florida



Source: SWFWMD, Planning Department
December 1999

regionally significant water bodies. The Basin Boards have strongly supported SWIM, as well as periodically funding water quality projects, at the request of and with matching funds from various local governments. Examples include coordination with the Hillsborough County Lake Monitoring Program and cooperative development of a lake atlas, a watershed analysis of the Manatee County reservoir, a cooperative project with the Natural Resources Conservation Service (NRCS) and Manatee County on agricultural impacts to water quality, a number of stormwater management master plans, and environmental/diagnostic assessments of selected lakes.

Lake Seminole in Pinellas County is a good example of a lake which has experienced water quality degradation. The completion of a Diagnostic Feasibility Assessment (see [Natural Systems](#) for a complete program description) has led to several specific projects that will be undertaken to improve the lake's water quality and related habitats. Stormwater and revegetation projects began in 1992, and additional projects are expected using a multi-agency cooperative effort that includes individual residents, the county, DEP, the Florida Fish and Wildlife Conservation Commission (FWCC) and the District.

1-1 Current Programs

The District has a variety of projects and programs in place to enhance surface water and groundwater quality data collection and water management activities. This assortment of programs is essential to preserving and improving water quality.

1-1.1 Groundwater Programs

Sources of potential groundwater contamination include fertilizers, injection wells, drainage wells, improperly abandoned wells, underground storage tanks, pesticides, septic tanks, landfills,

industrial waste sites, lawn and landscape maintenance, polluted surface waters and chemical spills. The Floridan aquifer is most susceptible to contamination in the northern half of the District where it is not protected by a continuous, overlying confining layer. The nature of aquifer media and the speed of groundwater movement can make rehabilitation of contaminated aquifers exceedingly difficult and costly. Prevention, therefore, is the appropriate emphasis of groundwater policy. Local wellhead protection programs, recharge area protection and management of known or potential groundwater pollution sources are the major initiatives needed to ensure a continued supply of high quality ground water.

There is a strong correlation between this section and the Source Protection segment of the [Water Supply](#) section. In fact, many of the District's **groundwater** monitoring and protection initiatives have already been discussed under Source Protection, including:

Water Quality Monitoring Program (WQMP);
Regional Observation and Monitoring Well Program (ROMP);
Water Resource Assessment Projects (WRAPs);
Water Use (Resource) Caution Areas (WUCAs);
Water Use Permitting (WUP);
Well Construction Permitting (WCP);
Quality of Water Improvement Program (QWIP);
Recharge Protection; and
Wellhead Protection (WHP).

These programs will not be reiterated here; the reader is referred to the [Water Supply](#) section for further information on these programs. There is an important distinction to be made, however, between groundwater quality (as addressed here) and source protection as previously addressed. Source protection implies management and protection for drinking water sources, while water quality initiatives for groundwater encompass all uses of this resource, including the natural environment. Most, if not all, of the programs listed above also contribute

toward this broader groundwater quality objective.

1-1.2 Surface Water Programs

The District accomplishes the monitoring, assessment, preservation and improvement of surface water quality through a broad range of activities including data collection, assessment, planning and project implementation. These are briefly described below.

1. Comprehensive Watershed Management (CWM)

The CWM initiative is described in Chapter III A., Issues Common to All Four Areas of Responsibility, and Chapter V., Watershed Management.

2. Stormwater Research

Urban and agricultural development can increase runoff and non-point pollution into rivers, lakes and streams. Initially, storm water was considered a water quantity problem solved by routing runoff into storm sewers or ditches as rapidly as possible. Stormwater pollution received nationwide interest as early as 1965 when storm sewer discharges were reported to contain pollutants comparable to untreated sanitary sewage. Non-point source pollution was identified as a significant source of water degradation under the Federal Clean Water Act in 1972. Revised federal rules require National Pollutant Discharge Elimination System (NPDES) permits for major stormwater systems, and mandate the development of programs to reduce pollution from permitted stormwater systems. Delegation of regulatory responsibility for NPDES permits by EPA to Florida's DEP will become effective as of October 1, 2000. DEP may in turn delegate portions of this program to water management districts. The SWFWMD is already significantly involved in stormwater management through its Environmental Resource Permitting Program.

The District is also involved, through a cooperative effort with local governments, in the development and implementation of watershed management plans for specific water bodies (e.g., Lakes Tarpon and Seminole in Pinellas County). In addition, the water management districts are required to develop Pollutant Load Reduction Goals (PLRGs) for surface waters. PLRGs have been established for SWIM waterbodies and can be established during development of waterbody specific management plans. These PLRGs can be used, along with other biological and flood control improvement targets, to set restoration goals for these waters.

Increased awareness of stormwater problems and enactment of new legislation has created a demand for reliable local stormwater data. State rules are based on "a rebuttable presumption that stormwater systems built under the rule will comply with state water quality standards." Stormwater research at the SWFWMD is designed to provide scientific documentation and information to support or modify our rules, evaluate the effectiveness of Best Management Practices (BMPs) and to assist the SWIM Section in reaching their objectives. District research is part of a coordinated statewide effort to determine effective and cost efficient treatment of stormwater runoff. A statewide stormwater conference is sponsored by the SWFWMD biennially to share information and discuss current trends and knowledge. Research results are also presented at state and national conferences.

3. Coordinated Watershed Monitoring

The SWFWMD has over 1,800 lakes, an estimated 8,900 miles of rivers, streams and canals, and vast aquifer systems. Within the CWM framework and in cooperation with local governments, a Districtwide monitoring plan is being developed to ensure adequate water chemistry data are collected to meet watershed planning and water quality management needs, and for measuring the effectiveness of watershed

management activities. To the extent possible, existing monitoring programs of state, federal and local governments will be used. Local governments that do not presently have monitoring programs will be encouraged to aid in the sampling scheme, either through the cooperative funding process or by collecting samples from sites within their region of concern.

A Regional Ambient Monitoring Program (RAMP) work group has been formed to enhance the quality, consistency and comparability of water chemistry data produced by the many monitoring agencies and laboratories in the District. This group meets regularly, consisting of members from local and State government monitoring programs and laboratories. The RAMP work group provides a forum for discussing standard methods of sample collection and analysis, and opportunities for coordination between monitoring agencies.

A Watershed Monitoring Coordination Subcommittee has been assembled within the RAMP work group to aid the selection of monitoring sites, to determine site-specific sampling and data access issues and to address other monitoring concerns. Committee members include representatives from state, federal and local government agencies actively involved in monitoring within the SWFWMD. The potential benefits of the comprehensive monitoring program include: the assurance that a sampling effort is not duplicated by multiple agencies; consistency of sampling and analytical methodologies among participating programs; better sampling coverage of water bodies that extend over more than one government jurisdiction; and improved agency and public access to water chemistry data.

4. Integrated Water Resource Monitoring (IWRM)

In October 1999, the historical trend ground water monitoring work of SWFWMD conducted under contract with DEP was merged with new contracts to assume the trend surface water monitoring work of the DEP Surface Water Assessment and Monitoring Program (SWAMP). These two efforts now constitute what is known as the Integrated Water Resource Monitoring (IWRM) network. The IWRM network will better meet the needs of the DEP to determine the water quality of streams, lakes and ground water throughout the state. The District plays a key support role for the IWRM through monitoring and data collection. The network is founded on statistical random network design principles similar to EPA's Environmental Monitoring and Assessment Program (EMAP) approach. This design allows for increased ease in data reporting for large-scale regional conditions, specifically for the EPA 305b report. The Florida Water Quality Assessment 305(b) Report identifies the quality and trends of the state's surface waters, provides summaries of stream, lake and estuary use support status, and identifies the causes of nonsupport of designated uses. Anticipated changes to this report include the addition of ground water quality information which the IWRM network will enable.

Habitat assessments and biological reconnaissance efforts will also be tied to the water quality monitoring to determine the overall health of a water body. Data will ultimately reside on the EPA STORET Database. Long-term trend monitoring at specific sites has been dramatically reduced as a result of this effort. However, the District intends to increase this type of monitoring through its CWM efforts as discussed in the Coordinated Watershed Monitoring section above.

5. Diagnostic/Feasibility Assessments

Diagnostic/feasibility assessments (DFAs) are water body-specific studies to identify problems and issues concerning various aspects of water management in the water body's watershed, and may include water quality and quantity, fish and wildlife habitat, recreation and human health. The assessment process draws upon the expertise and knowledge of agency staff, as well as concerned citizens, to define problems and issues, to make recommendations for remediation, restoration or preservation, and finally to implement the resulting management plan using the most cost-effective alternatives.

Within the SWFWMD the focus of many DFAs has been on water bodies from the SWIM-ranked priority list, although Basin Boards have cooperatively funded numerous non-SWIM DFAs, especially for water bodies with poor water quality and poor fish and wildlife habitat value, or that pose a threat to human health from bacterial contamination. The DEP has been directed by the EPA to develop Total Maximum Daily Loads (TMDLs) for pollutants and has assembled a list of priority water bodies for TMDL development. CWM teams and local governments have identified basins within their watersheds with the poorest water quality; and the Tampa Bay, Charlotte Harbor and Sarasota Bay Estuary Programs have identified issues concerning degraded water quality and excessive nutrient loading. From these issues and initiatives, future DFAs will arise.

6. Environmental Resource Permitting (ERP)

The District has adopted technical and administrative rules (Chapters 40-D-4, 40 and 400, F.A.C.) to regulate the construction and operation of surface water management systems. Water quality management criteria for the systems to treat stormwater are included in District rules. Projects must be designed so that discharges from permitted systems will be presumed to meet the applicable state water

quality standards. This regulatory program is described in greater detail in the Flood Protection section. The Natural Systems section also addresses the ERP.

7. Regulation and Enforcement

The District has been delegated authority to assist DEP in regulating water quality for nonpoint sources through a surface water permitting program. This occurs in concert with federal water quality regulatory efforts. State Water Quality certification occurs through the ERP program. Florida has one of the most advanced water quality protection programs in the U.S. Recently, the Florida Legislature directed the DEP to be the lead agency in developing TMDLs for designated impaired waters within the state. In addition, the federal NPDES program deals with both point and non-point source water quality issues. Current surface water quality regulations criteria in Florida reasonably satisfy the non-point aspect of the NPDES program. The point discharge aspects of the NPDES are administered by the DEP through a delegation from the EPA.

Some water use permits are issued with the condition that the permittee monitor water quality parameters in the source water body. This requirement is based on the potential for withdrawals to cause changes in the water quality characteristics of the source water body. Such water quality monitoring has been most often required for withdrawals from streams and wells in areas subject to intrusion by poor quality water. These data are typically analyzed as part of interpretive reports required by the permittee and are accessible to District researchers.

The Compliance and Enforcement Program at the District is currently integrated into each of the four District Service Office Regulation departments. Oversight of compliance and enforcement is provided by having all activities reviewed by a Compliance Coordinator. Surface water management systems are reviewed prior to

the authorization phase of the ERP. An ERP consists of two permits in one: a construction permit and an Operation and Maintenance phase authorization. The critical link between the two phases are As-built Drawings and Statement of Completion documents. Constructed systems are checked for compliance to make sure that both the As-built Drawings and Statement of Completion accurately reflect the permitted systems.

8. Surface Water Improvement and Management

Improved water quality and natural systems is a central goal of the SWIM program. It is closely tied to aquatic habitat and natural systems and involves both restoration and preservation activities. Excess nutrients and other pollutants from point and non-point sources must be controlled and eliminated to make meaningful water quality improvements in our surface waters. As water quality improves, the quality of aquatic habitat increases. These issues are addressed within SWIM through habitat restoration and stormwater retrofit projects.

The District is also statutorily charged with developing PLRGs for water bodies within its boundaries. This statewide requirement is described in 62-40.432(3)(b), F.A.C., and is intended to set “watershed stormwater pollutant load reductions necessary to preserve or restore beneficial uses of receiving waters.” All SWIM water bodies have PLRGs established. These are included in the majority of existing SWIM plans. PLRGs will be included in the remaining SWIM plans as they are updated. Establishment of PLRGs for non-SWIM water bodies will follow, and rely on recommendations from each CWM team as to which water bodies are priorities for PLRG development. Established PLRGs will provide a significant basis for derivation of TMDLs. A more in-depth discussion on SWIM can be found in the Natural Systems section of this Plan.

9. Land Acquisition and Management

The lands that the District acquires provide a broad spectrum of water resource protection and management benefits. Water quality preservation and enhancement is one of the major selection criteria considered in evaluating properties for potential acquisition. Natural lands maintain and improve water quality through many processes, including filtration of runoff, nutrient uptake and reductions in the rate and volume of stormwater runoff. Acquiring natural lands to protect and improve water quality using natural processes is an effective and efficient way to achieve water quality goals.

The Water Management Lands Trust Fund Save Our Rivers Preservation 2000 Five-Year Plan 1999 describes the District’s land acquisition and management activities and lists existing and proposed acquisitions. Information about specific District properties may be found in each property’s “Resource Evaluation Report(s)” produced prior to acquisition, in the “Land Use and Management Plans” developed for each property acquired, and in the *Recreational Guide to Southwest Florida Water Management District Lands*. Additional discussion of the District’s land acquisition activities may be found in the Natural Systems section.

10. Sinkhole Investigations

The District investigates sinkhole-related complaints as part of a Governing Board directive. Records are maintained on sinkhole occurrences and this information is provided to the public. Sinkhole records are a part of the District’s Regulatory database and can be accessed. Another aspect of sinkhole involvement is that direct discharge of storm water or pollutants into sinkholes is not allowed and is closely regulated.

11. National Estuary Program (NEP)

The NEP was established by the Federal Water Quality Act of 1987, which amended the Clean Water Act, to develop Comprehensive Conservation and Management Plans (CCMPs) for estuaries of national significance that are threatened by pollution, development or overuse. To develop these plans, the National Estuary Programs use the combined knowledge of citizen and technical advisors, senior governmental officials and staff, plus elected officials. Sarasota Bay was added to the NEP in June 1989, Tampa Bay followed in April 1990, and Charlotte Harbor in 1995. In 1998, the Tampa Bay NEP became referred to as the Tampa Bay Estuary Program. District SWIM staff are involved in the Tampa Bay Estuary Program and the Sarasota and Charlotte Harbor NEP projects to assure close coordination in planning and implementation.

The EPA encourages NEPs to follow a comprehensive basin-wide approach in managing pollution and habitat degradation problems. The EPA's "watershed planning approach" is intended to be a flexible framework for focusing various resources at the watershed level, integrating existing programs, and exploring innovative methods to achieve maximum results. This approach is consistent with the District's CWM Initiative.

12. Other Non-District Programs

Existing information and opportunities for shared research are used wherever possible. The USGS has provided data, or worked jointly with the District, to acquire water quality, stream flow (or discharge), and ecological information for a number of rivers in the District. The District also coordinates with the USGS for data and studies related to water use, surface water basin delineation, WQMP well data, and flood and estuarine studies. Additionally, the USGS creates a series of standard mapping products used at the District and is also a source of

historical photography. A number of other entities, from State agencies to local governments, are also valuable contributors to the coordinated efforts to protect surface water quality.

The District, through several cooperatively funded programs, helps to support the efforts of Florida Lake Watch. The Lake Watch program involves waterfront property owners in lake, stream, and watershed management. The program is sponsored by the University of Florida (UF) Department of Aquatic Sciences and supported by the State Legislature. UF staff teach volunteers living on lakes throughout Florida about standard water sample collection techniques and methods of monitoring. Samples are analyzed at the UF laboratory for nutrients and other common measures of water chemistry. In addition, UF staff meet with volunteers to discuss lake management problems and issues, and teach Lakewatch participants about watershed and lake management concepts.

Section 2. Issues Assessment

The District strives to advance its knowledge of natural systems and the influence of humans on them. Through enhanced knowledge, the District can move toward improving water resource management. Continuous improvement in our resource management efforts is a fundamental goal of the organization. District initiatives such as CWM and Coordinated Water Quality Monitoring, described above, are excellent examples of this improvement process. One of the main purposes of this Plan is to provide a mechanism whereby the District can identify areas for potential improvement (issues) and develop specific recommendations or strategies to achieve them.

The major water quality issues addressed in this plan include:

1. Preventing Degradation of Existing Water Quality

Components of this issue include:

- a. Protecting Water Quality for Natural Systems
- b. Coordinating a Strategy to Address Land Use Impacts

2. Restoring Degraded Water Quality

Components of this issue include:

- a. Supporting the Development of TMDLs
- b. Addressing the Emerging Concern of Nitrate Contamination

For each of these issues, action plans are ultimately identified in the Implementation Strategies section.

2-1 Preventing Degradation of Existing Water Quality

Protecting Water Quality for Natural Systems is a particular challenge given that surface water/groundwater and water quality/quantity connections are not always clear. Florida has a high degree of interconnectivity between surface and groundwater systems. Not only does water travel through paths of least resistance, it can do so quite rapidly. This has been shown, for example, at Sulphur Springs in Tampa where dye released at inland drainage sites has appeared in the spring in a matter of hours. Sinkholes, commonly found in the northern and eastern region of the District, create another easy path for surface contaminants to travel to ground water. Another example is recent information indicating a trend in increased nitrates in coastal springs. Management and preservation of water quality are made especially

difficult and complex by the fact that water does not stay within easily defined areas.

The linkage between the management of water quality and water quantity is presently incomplete. For example, protecting communities from flood hazards may conflict with preserving water quality in nearby water bodies. An example of an issue between agencies is the regulation of septic tanks by the Department of Health (DOH) primarily for public health protection. These regulations do not necessarily protect surface waters from excess nutrient loads.

Management of waste products from reuse water is another component of this issue. Reuse water is an excellent alternative to ground and surface freshwater withdrawals for many uses. However, knowledge is inadequate about the waste products from these sources, especially their long-term cumulative impacts.

Coordinating a Strategy to Address Land Use Impacts will be essential to accomplish future resource protection. Land- and water-use impacts are inseparable. Land-use practices such as ditching and draining or creating large expanses of impervious areas may reduce recharge, lower water tables and concentrate contaminants, increasing the risk of pollution. Wellfields located near the coast may induce saltwater intrusion. Industrial facilities have been demonstrated to cause point-source pollution to water bodies and aquifer systems. Mining activities increase the vulnerability of aquifers to contamination by removal of overlying unsaturated zones and clay units, allowing a direct conduit for contaminants to enter ground waters. Agricultural practices such as sludge spreading and chemical applications have the potential to introduce heavy metals and other pollutants into ground and surface water; also, old cattle (tick)-dipping vats are a known serious problem in certain areas. Urban and suburban development, landfills, pipelines, petroleum sales and storage facilities, dry cleaners, and other activities can expose ground

and surface water to a broad variety of potential contaminants that can be difficult to treat and remove.

Local governments have authority over land use decisions, making it important that their planning and actions be closely tied to the carrying capacity of natural resources and the agencies that manage them. Through practices such as regulating certain businesses or industries near municipal well fields; creating stormwater treatment facilities; requiring landfills to be properly lined, monitored and closed; requiring reclamation at mining operations; and regulating the spreading of sludge, state and local governments recognize that land use and ground and surface water are intricately linked. A few of the subissues pertinent to this land/water disconnect are:

- ❖ As noted earlier, almost the entire northern half of the SWFWMD is underlain by karst geology, causing surface and groundwater interaction. These areas, composed of highly soluble limestone, allow essentially immediate transfer of surface pollutants to the groundwater system.
- ❖ One of the largest threats to water quality is stormwater runoff from developed areas, construction, mining and agriculture. There are a multitude of stormwater facilities that are poorly maintained or not maintained at all, rendering them ineffective in their stormwater treatment functions. The responsible party is often unknown. Many are owned by private entities who have abandoned their upkeep. Many others were built prior to the inception of the permitting program and need to be improved to meet current standards. The high cost to retrofit these facilities can be staggering.
- ❖ Mining operations may create a host of water quality concerns. Older mines may have breached confining units, allowing a direct conduit for contaminants to reach ground water. Abandoned mines may be used as dumping

grounds for potential pollutants. Residual debris from mining operations may allow contaminated runoff to enter surface water bodies. At minimum, such debris piles may increase sediment contamination. Mining operations adjacent to District-owned properties may undermine the purpose for protecting these lands.

- ❖ Water quality is being impacted by heavy water withdrawals over extended periods in certain areas. Saltwater intrusion from lower aquifers and coastal areas is becoming an increasing threat to ground water in the southern half of the District. Saltwater intrusion has been identified in southern Hillsborough, Manatee and northern Sarasota counties (Eastern Tampa Bay WUCA), and impacts to the surface environment and localized saltwater intrusion have also been identified in Pinellas County and other parts of the metropolitan Tampa area (Northern Tampa Bay WUCA).

2-2 Restoring Degraded Water Quality

Supporting the Development of TMDLs by the DEP will assist the District with many water quality remediation issues and activities. The historic District designation of PLRGs for a number of water bodies has focused primarily on non-point pollutant loading. TMDLs will include both point and non-point loading to a water body. Established PLRGs and the development of TMDLs must be integrated.

Another restoration issue is contaminated District-owned lands. Although environmental audits are currently performed on all properties prior to purchase, the District has found contaminated sites on properties acquired prior to the inception of such audits. An example is an abandoned landfill found along the Tampa Bypass Canal. Occasionally the District has found itself the owner of properties with contamination problems. These have included poorly operating septic tanks, abandoned gas tanks, cattle(tick)-dipping vats, and landfills.

Recent legislation has removed liability for private owners of property upon which cattle(tick)-dipping vats are located. This may affect the District's land evaluation and purchasing activities. Equally troublesome are the effects of adjacent land uses to District lands. These include impacts from mining enterprises and cattle grazing. Given that District lands are purchased to preserve or restore high quality natural resources, such conflicts can undermine the expenditure of millions of tax dollars.

Contamination from abandoned artesian wells is also discussed under the Water Supply, (Source Protection) section of this document. This problem is associated with the thousands of wells which may be allowing interaquifer exchange or the depletion of groundwater resources. Wells constructed prior to current standards often do not have adequate casing and expose several aquifers of varying water quality to one another. Thousands of these wells exist and allow potable water supplies to be contaminated with mineralized water from deeper aquifers or by contaminants from the surface. Additionally, contaminated and potable ground water may flow freely to the surface, wasting potable water and contaminating surface water. Given that surface waters, the water table, and deeper aquifers are often interconnected, and the pervasiveness of improperly constructed wells which breach confining layers, the danger may spread to drinking water aquifers. Plugging abandoned artesian wells eliminates the waste from uncontrolled discharge and the degradation of groundwater resources from inter-aquifer contamination.

Groundwater contaminants as a general category are cause for concern. The DEP has several programs to identify contaminated groundwater sites. Rule 62-524, F.A.C., is an effort to address part of the problem by requiring new potable water wells in delineated areas of contamination be built to more stringent specifications. The DEP list of contaminated

sites includes some Superfund sites but does not include information from other federal and local collection efforts. This list may need to be expanded as additional data becomes available. There is concern that the District has not been adequately attentive to the quality of water after it has been used as permitted. This potential conflict was illustrated by impacts to Lake Thonotosassa from water permitted through a WUP. This water was used to process seafood and then discharged to the lake in a highly degraded state.

Spring water is a reliable indicator of the health and quality of aquifers, chiefly the Floridan. In general, springs within the District are in good condition. Unfortunately, many springs, including those from Marion to Hillsborough counties, are experiencing the negative impacts of development, population growth and increased recreational usage. Rapid growth over the past twenty years has had a profound effect on these springs, notably by increasing pollutants and exotic vegetation. These problems do not have a single cause. In fact, studies indicate that many pollutants probably come from sources far removed from the actual spring. While the current concern revolves around nitrates as noted below, other impacts to the water quality of springs are a concern.

Addressing the Emerging Concern of Nitrate Contamination will be a challenge for agencies with water quality responsibility in the future. Nitrates within groundwater pose a problem for springs and other surface waters, and in some areas water supply aquifers. Nitrates are a form of nitrogen derived from fertilizers and human and animal waste. A variety of land uses have the potential to create groundwater nitrate problems. Agricultural land uses have been shown to increase nitrate and pesticide levels in unconfined aquifers. Urban and residential land uses introduce nitrate to aquifer systems through faulty septic tanks, over-fertilization of landscapes and direct stormwater runoff into aquifer systems.

While the amount of nitrates found in springs is not currently above drinking water standards, there appears to be a trend of increasing nitrate levels. Amounts of this nutrient found in springs have increased steadily since the 1950s and 1960s. Higher nitrate levels can lead to increased growth of aquatic weeds and algae, and degraded water clarity in rivers and downstream water bodies associated with springs. This issue is linked to another discussed above concerned with increased nitrates as a result of alternative water sources such as the reuse of treated wastewater.

The Florida legislature recognized these emerging trend data and in 1994 took affirmative action to establish a process for the development and implementation of science-based, agricultural Best Management Practices. As set forth in those 1994 modifications to Chapter 576, F.S., the Florida Department of Agriculture and Consumer Services (DACS) has been working with the SWFWMD to prioritize and fund research to help mitigate this groundwater issue as it relates to production agriculture. The initial thrust of this effort has been focused on citrus production on the central sand ridges of Lake, Polk and Highlands counties; however, other efforts are underway within the District to address additional agricultural sectors as well as homeowner fertilizer use.

Section 3. Water Quality Management Policies

The following policies provide long-range guidance to the District in fulfilling its statutorily based water quality management responsibilities. These policies express the position or strategy of the District that will be applied consistently in response to various water-quality issues. In this case, "District" refers to the Governing Board and Basin Boards, since both make funding and other decisions in the best interest of the resource.

These policies may be implemented only to the extent that financial, staff or other necessary resources are available, pursuant to the budgetary actions of the Governing Board and Basin Boards. These policies do not create any regulatory authority and may require rule making as one component of their implementation. The policies contained within the Plan shall be reasonably applied where they are environmentally, technically and economically feasible. These policies shall be construed and applied as a whole, in recognition of the policies within all areas of responsibility within the Plan. No specific policy shall be construed or applied in isolation from the other policies in the Plan.

As noted, in many instances surface and ground water cannot be separated. Those policies that are not possible to treat exclusively as relating either to surface or ground water are shown below in a combined category.

3-1 Surface and Groundwater Quality Policies

It is the policy of the District to:

1. View surface and ground water as parts of an interconnected hydrologic system where impacts in one area generally have repercussions in others; merge water quantity and water quality activities, and require that these aspects of the resource be treated concurrently in all water resource planning and management processes.
2. Seek to reduce the potential pollution to ground and surface water from all site modification and redevelopment projects.
3. Protect, restore and manage features of District-owned lands that contribute to water quality enhancement, and where feasible, use these lands to demonstrate the most innovative and effective practices and technologies for activities with the potential to affect water quality.

4. Support the reduction, reuse and recycling of solid waste and alternative disposal methods within District operations and in coordination with other agencies.
5. Coordinate with other agencies to encourage environmentally sound solid waste, hazardous waste and wastewater treatment disposal and reduction methods.
6. Achieve continuous improvement in the detailed resource monitoring systems that provide trend information and refine our understanding of the resource.

3-2 Surface Water Quality Policies

It is the policy of the District to:

1. Manage surface waters to maximize the treatment potential of natural or restored systems, without degradation of such systems.
2. Restore or preserve the chemical, physical, and biological integrity of surface waters in the District, including wetlands and related habitat, through partnerships between the state, other regional agencies, local governments, and property owners.
3. Eliminate the discharge of inadequately treated stormwater runoff into waters in the District; support retrofit programs to reduce surface water degradation from the discharge of storm water.
4. Support the development and implementation of stormwater utilities by local governments throughout the District.
5. Coordinate land acquisition with the regional need to remediate non-point sources of pollution.
6. Coordinate with agencies, associations and other entities responsible for water control structures; operate the District's water management structures and flood control works to minimize impacts to water quality while providing an adequate degree of flood protection.

3-3 Groundwater Quality Policies

It is the policy of the District to:

1. Protect aquifers from contamination through appropriate regulatory and incentive programs.
2. Manage the location, construction, maintenance, use and abandonment of water wells to prevent harm to water resources by contamination, overdraft, or other adverse environmental impacts.
3. Support efforts to protect potable water wells, well fields and contributing areas from contamination through partnerships between the state, other regional agencies, local governments, and property owners.

Section 4. Implementation Strategies

Implementation strategies are the means through which the District responds to identified issues to improve water resource management. They are the synthesis of our planning efforts. Within this section, implementation strategies are described for the District's major water quality initiatives, including those for the issues previously identified. The format includes, as appropriate, tasks, schedules and identification of responsible entities. It is important to remember that many of the District's existing programs serve as the foundation for responsive strategies, e.g., Environmental Resource permitting as it relates to maintaining water quality.

4-1 Preventing Degradation of Existing Water Quality

Task 1: Enhance ongoing coordination of water quality and flood protection activities through evaluation of flood control activities as part of the District's Flood Protection Coordination Initiative (implemented in selected priority counties by 2004).

Responsible Entity: District Resource Management Department and CWM teams.

Task 2: Work with DEP and other appropriate agencies to evaluate the need for an assessment of the impacts of waste products from alternative water supply sources by no later than June 2004.

Responsible Entity: District Resource Management Department.

Task 3: Support research by the DOH and DEP on the impacts of land spreading of solids from wastewater treatment on surface water bodies and nitrate increases found in ground water and springs (ongoing).

Responsible Entity: District Resource Management and Regulation departments.

Task 4: Support ongoing research by the DOH, DCA and local governments on possible thresholds or carrying capacities acceptable for different wastewater systems and soils.

Responsible Entity: District Resource Management Department.

Task 5: Focus District stormwater design studies on appropriate systems for development in areas of karst geology by no later than 2002.

Responsible Entity: District Resource Management and Regulation departments.

Task 6: Begin the process to investigate more effective, small permittable stormwater facilities, as shown by previous District research by 2001.

Responsible Entity: District Resource Management and Regulation departments, DEP, and local governments.

Task 7: Evaluate regulatory and non-regulatory opportunities to improve water quality during site redevelopment by no later than 2005.

Responsible Entity: District General Counsel, Resource Regulation departments and local governments.

Task 8: Support ongoing multi-agency coordination on research, regulation, disposal and reuse of mining byproducts.

Responsible Entity: Peace and Alafia CWM Teams, District Resource Regulation Department, DEP, local governments.

Task 9: Support multi-agency coordination (team permitting) for review of large projects on an ongoing basis.

Responsible Entity: District Planning and Resource Regulation departments, DEP, COE, FWCC, RPC, and local governments

Task 10: Identify pre-regulated mines in the SWFWMD and develop a database. Work with DEP and local governments to address the closure, reuse or rehabilitation of mines opened or abandoned prior to current regulations by 2003.

Responsible Entity: District GIS, Resource Regulation, General Counsel departments, and local governments.

4-2 Restoring Degraded Water Quality

Task 1: Continue ongoing development of monitoring program to support DEPs IWRM project to gather data in support of TMDL development.

Responsible Entity: District Resource Data Department, CWM, DEP.

Task 2: Complete development of CWM's Districtwide surface water quality monitoring network by FY 2001 in coordination and cooperation with local governments and other monitoring agencies.

Responsible Entity: CWM teams, District Resource Data, and Resource Management departments.

Task 3: Complete upload of District data to EPA's STORET in support of 305b report and TMDL development by January 2000, and as necessary thereafter.

Responsible Entity: District Resource Data Department.

Task 4: Implement the District's PLRG schedule to include:

- a. Reflecting established PLRGs in the remaining SWIM waterbody plans as they are updated;
- b. Use of the CWM Team process to prioritize watersheds and water bodies for PLRG development within each of the 11 CWM areas;
- c. Within one year of study completion, set PLRGs for those water bodies currently undergoing Diagnostic Feasibility Assessments.
- d. Set PLRGs for water bodies receiving discharges from systems requiring an NPDES permit on a priority basis.
- e. Coordination with DEP on the schedule for TMDL development.

Responsible Entity: District Resource Management Department, CWM Teams.

Task 5: Target District awareness and coordination efforts on an ongoing basis to other agencies involved in activities that impact District or other public properties, including federal, State and local permitting programs.

Responsible Entity: District Communications and Community Affairs and Land Resources departments.

Task 6: Work with local governments, planning agencies and landowners to develop, implement, and monitor ways to achieve appropriate location of land uses that offset regional and local groundwater problems (ongoing).

Responsible Entity: District Planning and Resource Regulation departments, CWM teams and local governments.

Task 7: Design and initiate a program to locate all improperly constructed or deteriorating wells in the District by no later than 2004.

Responsible Entity: District Resource Data Department, local governments and private landowners.

Task 8: Expand ongoing involvement in protection/site selection of public supply well fields and other significant water uses through wellhead protection assistance and District water supply planning efforts.

Responsible Entity: District Resource Data, Resource Regulation, Resource Conservation and Development, and Planning departments, local governments, and well owners.

Task 9: Monitor and support research on an ongoing basis into residuals found in treated wastewater that are outside drinking water standards, such as pharmaceutical and other inorganic constituents.

Responsible Entity: District Resource Conservation and Development Department, DEP, and County Health departments.

Task 10: Develop a comprehensive groundwater contamination database, including the mapping of pollution sources, by 2003.

Responsible Entity: District GIS and Resource Management departments.

Task 11: Evaluate the opportunity for the Polk-Highlands-Hardee water supply authority (if established) to address groundwater contamination by the end of 2001).

Responsible Entity: District Planning Department, RPC, local governments.

Task 12: Establish a multi-agency work group to address contamination in the Highlands Ridge area by no later than 2002.

Responsible Entity: SWFWMD; SFWMD; DEP; Polk-Highlands-Hardee Water Supply Authority (if established); DACS; DOH; appropriate RPCs; local governments and utilities.

Task 13: Continue ongoing research on local geohydrology in the different parts of the District to better understand impacts and travel times of contaminants in ground water.

Responsible Entity: District Resource Management Department.

Task 14: Continue involvement in the Southwest Nitrate Remediation Work Group (ongoing).

Responsible Entity: District Planning, Resource Data, Resource Management, Communications and Community Affairs departments, other agencies, and industry representatives.

Task 15: Continue coordinated research on BMPs and sources of nitrates on an ongoing basis.

Responsible Entity: District Resource Data, Technical Services, Resource Management departments.

Task 16: Continue District involvement in multi-agency assessment of the effectiveness of BMPs and performance standards in protecting ground water (ongoing).

Responsible Entity: District Resource Regulation Department, others.

Task 17: Support multi-agency research on soil assimilation of nitrates for various soil types.

Responsible Entity: District Resource Management and Regulation departments, others.

Section 5. Performance Measures

The District has an existing effectiveness measures initiative. The purpose of this effort is to develop methods to measure accomplishment of the District's mission and goals, provide regular trend information to decision-makers and create public awareness of District accountability. In effect, this process develops a picture of the "state of the resource" to assure adequate water supply, protection of water quality, flood protection and preservation of natural systems. It is discussed in greater detail in the Management Services section.

In addition, the District has been working with the EOG and the DEP to develop "core" performance measures for both budgeting and water management planning purposes. These are measures that all the districts have in common, with each district free to have additional measures as needed. Measures have been developed for each of the four major areas of responsibility (water supply, flood protection, water quality and natural systems), as well as for all four areas collectively. The entire set of measures developed is shown in the section of

Water Management Goals and Policies, while those noted below are for water quality only. In addition, the core measures previously portrayed in the District's 1998 District Water Management Plan Annual Progress Report are shown below (see Figures 22 and 23) as examples of how the measures will be graphically depicted.

5-1 Water Quality Measures

Objective 1: Protect and improve surface water quality.

- a. Percentage of water segments that fully meet, partially meet, and do not meet their designated uses as reported in the DEP State Water Quality Assessment (the 305(b) Report).
- b. Number and percentage of water bodies with approved SWIM plans for which PLRGs have been established.
- c. Percentage of total stream miles and lake and estuary area in the District assessed for ambient water quality.

Objective 2: Protect and improve ground water quality.

- a. Improving, degrading and stable trends in groundwater quality, as reported in the DEP State Water Quality Assessment (305(b) Report).
- b. Improving, degrading and stable trends in nitrate concentrations in springs, as reported in the DEP State Water Quality Assessment (305(b) Report).

Figure 22.

Basin-by-Basin Water Use Support*

The 305(b) Technical Report produced by the Florida Department of Environmental Protection (FDEP) provides useful water quality information on a statewide and basin-by-basin level. Under Florida’s water quality protection programs, waters are classified for different uses (such as drinking water, shell fishing, and fish and wildlife maintenance). This performance measure shows whether the water quality needed to support the designated use is being attained. Though not universal as of 1996, there is a positive trend of improving water quality in the basins noted below within the District.

Basin	1992	1994	1996
Hillsborough River	○	○	◐
Lake Thonotosassa (SWIM water body)	○	○	○
Alafia River	○	○	●
Tampa Bay (SWIM and NEP water body)	○	○	◐
Sarasota Bay (SWIM and NEP water body)	◑	◑	◑
Peace River	○	○	◑
Myakka River	●	●	◑
Charlotte Harbor (SWIM and NEP water body)	●	●	●
Estuary System	●	●	●

- Not Supported
- ◑ Not Supported-Partially Supported
- ◐ Partially Supported
- ◒ Partially Supported-Fully Supported
- Fully Supported

* Use Classifications are defined in Ch. 62-302.400, F.A.C. according to the criteria in Ch. 62-302.530 F.A.C.

Source: FDEP 1992, 1994, and 1996
State Water Quality Assessment (“305(b) Report”)

Figure 23.

SWIM Water Bodies with Approved Pollutant Load Reduction Goals (PLRGs)

The "Pollutant Load Reduction Goal" for a water body is the estimated numeric reductions in pollutant loading necessary to preserve or restore the designated use of that water body. First priority is given to SWIM water bodies, with PLRGs set as SWIM Plans are revised. Both the number of SWIM water bodies with an approved PLRG, and where the PLRG is being met, have increased from 1998 to 1999.

SWFWMD SWIM Water Bodies

	Approved PLRG	Approved PLRG is being met
Charlotte Harbor	✓	
Winter Haven Chain of Lakes	✓	
Lake Thonotosassa	✓	
Sarasota Bay	✓	
Banana Lake	✓	
Lake Tarpon*	✓	✓
Rainbow River	✓	✓
Lake Panasofkee	✓	✓
Crystal River/Kings Bay	✓	✓
Tampa Bay	✓	✓

Source: SWFWMD, SWIM Section, 1999

* The existing PLRG is being revised to reflect nutrient load reductions contained in Pinellas County's Lake Tarpon Drainage Basin Management Plan.

Part E. Natural Systems Management

A natural system is defined as "an ecological system supporting aquatic and wetland-dependent natural resources, including fish and aquatic and wetland-dependent wildlife habitat." (62-40.210(16), F.A.C.) Natural Systems Management represents the fourth resource-based area of responsibility for Florida's water management districts. This includes the preservation, protection and restoration of natural Florida ecosystems and the establishment of minimum water flows and levels necessary to maintain these natural systems.

Natural Systems Goal: Preserve, protect and restore natural systems in order to support their natural hydrologic and ecologic functions.

Section 1. Resource Assessment

The District encompasses a wide variety of terrestrial and aquatic ecosystems that are all dependent to varying degrees upon fresh water. They can be broadly identified in four categories according to their vegetational associations: upland, mesic (wetlands), wet (water bodies) and coastal (estuaries). These environments have been previously referenced in the [District Overview](#). Ecosystems are complex, dynamic entities that must be carefully studied to be properly understood. The use of an ecosystem approach in natural systems management provides a major advantage in that it allows us to observe and respond to our environment in a comprehensive manner. Moreover, this nature-based approach is consistent with emerging federal (watershed planning), state (watershed management) and District (CWM) programs.

The District's primary means of achieving natural systems management are through its land acquisition program (including the planning and management of such lands), establishment of MFLs, the Aquatic Plant Management program, SWIM program, permit-based wellfield monitoring and wetlands protection linked to regulatory programs. The CWM Initiative is an additional tool of growing significance. Described below are the various resource initiatives that provide effective natural systems management within the District. As our area continues to experience rapid growth and the demand for water continues to expand, natural systems management issues present new challenges to the District. These issues are described within the [Issues Assessment](#) section that follows.

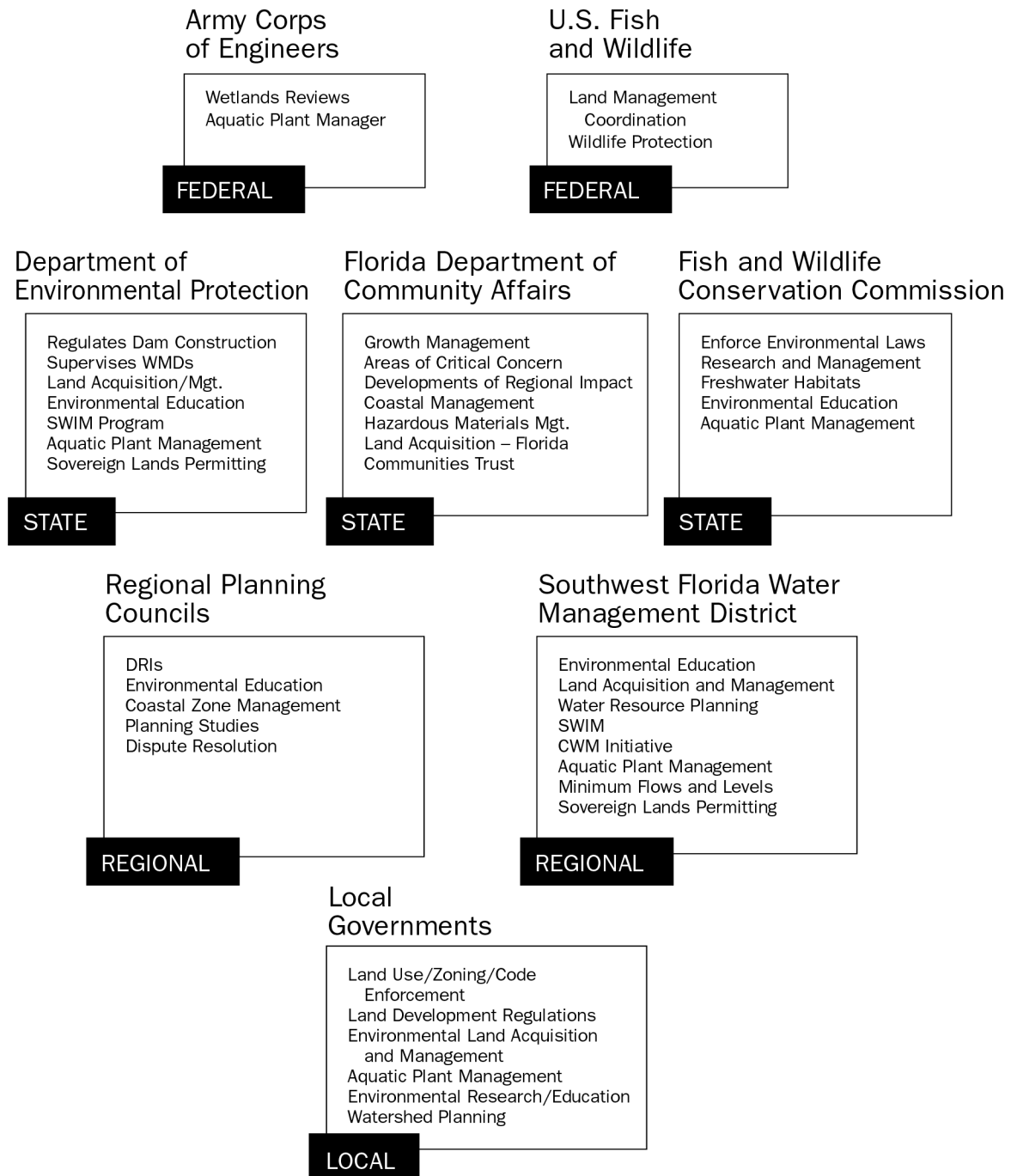
1-1 Current Programs

The District's initiatives in natural systems management include programs designed to identify and assess those natural systems requiring protection, preservation and/or restoration. These assessment activities are solidly supported by various management programs, such as land acquisition intended to ensure proper management of natural systems and protection of the water resource.

The District's approach is both proactive and comprehensive when it comes to natural systems management. Other agencies, however, also have significant responsibilities in this area, as can be seen in Figure 24. The District works closely with state and local agencies, among others, to achieve maximum public benefits while carefully protecting water and related natural resources.

Figure 24.

Agencies Responsible for Natural Systems Management in Southwest Florida



Source: SWFWMD, Planning Department
December 1999

1-1.1 Natural Systems Management Programs

1. Land Acquisition and Management

It is widely recognized that public ownership is one of the most effective means of preserving Florida's remaining natural systems and their associated water resource benefits. The District has undertaken the acquisition of lands for a broad spectrum of water resource protection and management benefits. These benefits have included: flood protection, water quality protection and improvement, water supply development, protection of recharge areas, protection of wetland systems (such as headwater swamps and floodplains) and restoration and management of uplands.

Land acquisition at the District has been guided and funded by two major statewide initiatives: The Water Management Lands Trust Fund (WMLTF), also referred to as the Save Our Rivers (SOR) Program and Preservation 2000 (P2000). These programs target the protection of natural resources at the regional level. Lands of importance to water resources and water management are acquired, along with lands of unique environmental values endangered by development activities. The process involved in identifying, selecting, acquiring and managing these lands is shown in Figure 25.

As of August 1999 the District has protected over 320,000 acres through fee simple acquisition and less-than-fee simple techniques (e.g., conservation easements), the majority of which were funded through the SOR and P2000 programs. (See Figure 8, District Overview.) A new program, "Florida Forever," was instituted by the State Legislature during its 1999 session as a replacement for Preservation 2000, which is scheduled to end in the year 2000. The Florida Forever Program is scheduled to take effect July 1, 2001. The balance of this subsection provides a brief overview of the District's land acquisition, planning and management efforts.

Save Our Rivers Program. Created in 1981 by the Florida Legislature, the WMLTF is administered by the DEP and funded from the Documentary Stamp Tax. The legislation enables the water management districts to acquire lands necessary for water management, water supply, and the conservation and protection of water resources. All land to be acquired must be included in a five-year land acquisition plan.

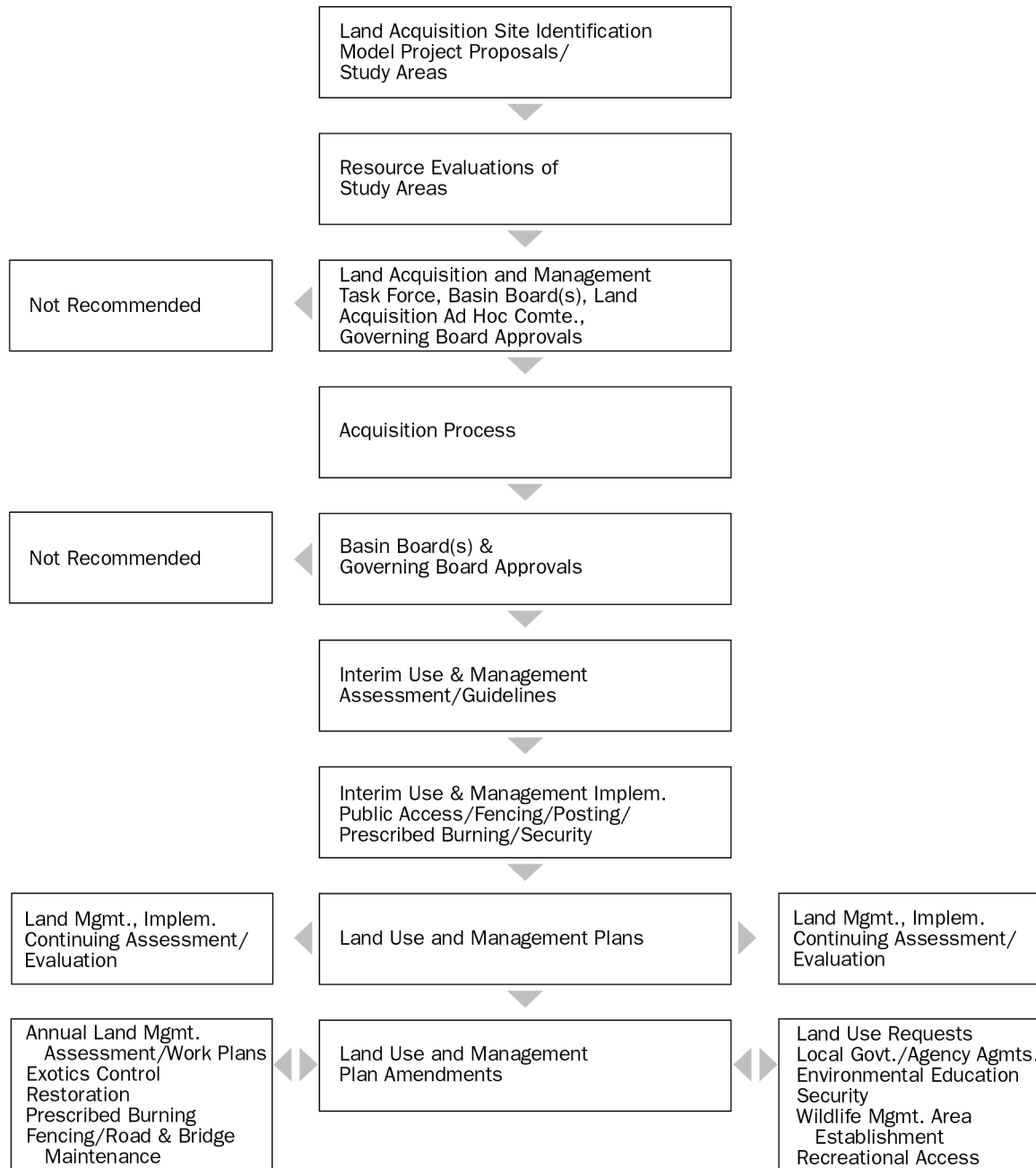
Since 1986 the water management districts (WMDs) have been permitted to use WMLTF funds for management, maintenance and capital improvements, including but not limited to fencing, signs, fire lanes, control of invasive exotic species, controlled burning, habitat inventory/restoration, law enforcement, access roads and trails, and minimal public accommodations, such as primitive campsites, garbage receptacles and toilets. Once acquired, making management funds available is essential to maintain and protect natural resources in accordance with the mandates of the SOR program.

Beginning in 2001, WMLTF funds may no longer be used for acquisition, but will be primarily used for land management and SWIM restoration activities (see "Florida Forever" below).

Preservation 2000 Program. The Florida Legislature passed the Florida Preservation 2000 Act for land acquisition in June 1990. Policy direction contained in the legislation states that public land acquisition should be based on a comprehensive assessment of Florida's natural resources and planned to protect the integrity of ecological systems and provide multiple benefits, including preservation of fish and wildlife habitat, recreation space and water recharge areas. The Act further recommends that governmental agencies should work together to purchase land jointly within ecological systems. To that end, the District has several joint acquisition partnerships with the State of Florida and Hillsborough, Pinellas, Hernando, Sarasota, Polk and Manatee counties.

Figure 25.

Land Acquisition, Use and Management Planning and Implementation



Source: SWFWMD, Land Resources Department
December 1999

Another important aspect of the P2000 program is its emphasis and direction to use alternatives to fee simple acquisition. "Alternatives to fee simple acquisition" are defined as including, but not limited to: "purchase of development rights; conservation easements; flowage easements; purchase of timber rights, mineral rights, or hunting rights; purchase of agricultural interests or silvicultural interests; land protection agreements; (and) fee simple acquisitions with reservations" (259.101, F.S.). The WMDs are required to complete at least two such acquisitions per year and to educate landowners regarding such alternatives. To date, the District has protected over 41,000 acres using these alternatives.

Statewide, the P2000 program has provided approximately \$300 million annually for ten years, based on annual funding appropriations from the Legislature. Distribution of the funds provided 30 percent for the WMDs, of which the Southwest District received 25 percent. This equated to approximately \$20 million per year for the SWFWMD over the life of the program.

Florida Forever Program. Passage of the Florida Forever Program by the 1999 Legislature will continue land acquisition funding through 2010 as the successor to the P2000 Program. Generally, the program becomes effective July 1, 2001, and will allow issuance of bonds over a ten-year period in an amount not to exceed \$3 billion. Funding available to the District (estimated at about \$26 million per year) can be used for "acquisition and improvement of land, water areas, and related property interests and resources, in urban and rural settings, for the purposes of restoration, conservation, recreation, water resource development, or historical preservation, and for capital improvements to lands and water areas that accomplish environmental restoration, enhance public access and recreational enjoyment, promote long-term management goals, and facilitate water resource development." (215.618 (1), F.S.) The District must use at least 50 percent of their funds over the life of the program for land acquisition.

Land Acquisition Site Identification Model. In 1991 the District developed its Land Acquisition Site Identification Model which was designed to aid the District in targeting lands for acquisition. The model uses a set of overlay maps representing the locations of areas within the District considered most important for particular water resource benefits. Four major water resource themes were developed within the model: water supply protection, flood protection, natural systems protection, and management and acquisition considerations. The Model identified those properties within the District most suitable for acquisition under the SOR and P2000 programs. The Model was updated in 1997 in response to the Legislature's requirement for the agencies receiving P2000 monies to develop a "Remaining Needs and Priorities" report. The District's report was approved by the Governing Board in September 1997.

Selection, Resource Evaluation and Acquisition Process. Each property under consideration for acquisition by the District has a resource evaluation report formulated by an interdepartmental staff team. This report is submitted to the Staff Land Acquisition and Management Task Force which reviews the evaluation and formulates conclusions and recommendations. The Task Force is comprised of senior management and technical staff representing a wide range of expertise within the District. During the evaluation process, the staff may find it necessary from a water management standpoint to increase or reduce the size of the proposed acquisition. The completed report and recommendations are submitted for review to the appropriate Basin Board(s) and then to the Land Acquisition Ad Hoc Committee. This committee consists of one member from each Basin Board. Ultimately, the report and recommendations are submitted for approval to the Governing Board. Once a project is approved for acquisition, the District's SOR/P2000 Five-Year Plan is amended accordingly.

Land Use and Management Assessments. To ensure the natural values of District-owned lands are protected, the District conducts more definitive environmental assessments upon acquisition. These analyses identify the current status of natural resources, critical water management functions, significant ecological resources and potential threats to their preservation.

Land Use and Management Planning and Implementation. The SOR statute requires that lands acquired through the program be managed in an environmentally acceptable manner which serves to preserve and/or restore their natural condition. Public land uses that are compatible with the preservation and restoration directive, and that are not inconsistent with the water management purposes for which the lands were acquired, are to be permitted. These land uses consist largely of resource-based recreation. The District prepares site-specific land use and management plans for each District-owned property in order to formalize those uses and management regimes that are appropriate for the property. As of this writing, 88 percent of the District's land-use plans have been completed or are under way, covering 96 percent of the District's landholdings requiring plans. All plans must ultimately be reviewed and approved by the Governing Board.

The management goals and objectives within the land-use plans are implemented using a variety of approaches. These approaches include cooperative development with other governmental agencies, working with recreational user groups and nonprofit sponsorship. Cooperative development and management projects are typically handled through formal agreements. For example, the District has entered into 41 agreements with a variety of city, county and state agencies. The assistance of user groups and nonprofit organizations are typically solicited to achieve recreational amenities and other infrastructure objectives.

During the 1998 fiscal year (FY), approximately 2.3 million people visited District-owned lands. Raising the environmental awareness of these visitors is a primary goal of the District's public use management strategy. To achieve this goal, the District has entered into agreements with Pinellas, Hillsborough and Pasco counties to provide environmental education programs, developed an interpretive trail and brochures with the assistance of nonprofit organizations, used volunteers to conduct "visitor awareness days," sponsored or led interpretive hikes and made presentations at numerous civic, user groups and environmental organization meetings.

Land use planning and management of District-owned lands encompasses a variety of activities, including prescribed burning, control of exotics, restoration, timber and wildlife management and resource monitoring. Each of these activities are briefly described below.

❖ *Prescribed Burning.* Periodic fire is a natural element of native Florida ecosystems. The District uses prescribed burning as a tool for a variety of land management purposes, including reduction of hazardous brush buildup, habitat enhancement, encouragement of natural pine regeneration and site preparation for restoration projects. The District's prescribed burning program includes natural systems such as pine flatwoods, sand hills, scrub and freshwater marshes. These systems are burned at the appropriate frequency with an annual goal of approximately 20,000 acres.

❖ *Exotics Control.* The invasion of native plant communities and ecosystems by exotic, nonnative plant and wildlife is widely recognized as one of the primary threats to the environmental integrity of Florida's remaining natural areas. Some District-owned lands have been invaded by exotic species such as cogon grass, Brazilian pepper, skunk vine, melaleuca and tropical soda apple. Rooting damage by the overpopulation of feral hogs is an ongoing problem as well.

District Procedure 61-9, Control of Exotic Flora and Fauna on District-Owned Lands, was adopted to guide staff in the control of exotics invasions. Through this program, staff identifies and documents infestations, and prescribes and coordinates the appropriate control treatments. In FY 1996, the District initiated a coordinated effort among the water management districts to develop a prototype for a statewide exotic plant control plan. The resulting document, Exotic Plant Invasion on Florida's Water Management District Lands (1997), includes recommended strategies for a comprehensive approach to the statewide exotic plant problem. An Interdistrict Exotic Plant Management Committee composed of staff from each district was formed to implement the recommendations of the plan. The District has initiated studies to determine the feasibility of targeting skunk vine with biological control, and developing interim Best Management Practices for skunk vine, a serious invasive exotic plant in central Florida.

❖ *Restoration.* The primary goal of the District's restoration program is to reestablish natural plant and animal communities on District-managed lands that have been disturbed or impacted by past land uses such as logging and agriculture. District Procedure 61-10, Natural Systems Restoration, defines the District's approach in future restoration efforts and criteria by which staff identifies and prioritizes sites for restoration. This process has resulted in a ten-year natural systems restoration plan. Active implementation of restoration commenced in 1998.

To date, the District has initiated restoration on approximately 7,300 acres of altered systems, including pine flatwoods and xeric scrub communities. In 1997, the District initiated the first off-site restoration project with the Florida Department of Transportation (DOT) to mitigate road expansion impacts. The Marion 1 project entailed the restoration of 450 acres of freshwater marsh, pine flatwoods and hardwood hammock communities. This project was completed in FY

1998. A similar project with DOT was initiated in FY 1998 on 465 acres within the Cypress Creek project. This project entailed the restoration of freshwater marshes through the back-filling of rim ditches and regrading and revegetation of filled pine flatwoods communities. The project was completed in FY 1999.

Staff has begun a restoration project in the Green Swamp West property that will entail hydrologic restoration by filling ditches and the restoration of approximately 400 acres of improved pasture back to longleaf pine sandhill community. Completion is scheduled for FY 2000.

In accordance with Section 373.4137, F. S., the DOT provides an annual Districtwide report of projected road construction impacts. Based on those projections, the District develops an annual mitigation plan to compensate for the impacts. Restoration priorities identified in the ten year restoration plan are candidates for this program. In FY 1999 the District initiated DOT mitigation projects on the Upper Hillsborough property. Work will include hydrologic restoration through ditch filling and plugging. Completion is scheduled for FY 2000.

❖ *Timber Management.* In 1994, the Governing Board directed staff to evaluate all available alternative sources of land management funding to assure that in the long term, the management of District lands has reliable, sustainable funding not solely reliant upon the WMLTF or other public sources that might not be permanent. One obvious future funding source being developed is the sustainable management of planted pine timber on District-owned lands.

The timber management program entails the establishment of timber management zones (TMZs) on altered sites, such as pastures, to be managed for long-term revenue generation. To implement this new initiative, staff is conducting a four-phased developmental process. In phase

one, all existing planted pine sites on District lands were identified and inventoried to obtain standing timber volumes. Phase two entailed the identification of altered sites on District lands that have potential for future TMZs. For this site selection process, staff developed and applied a set of detailed ranking criteria. Phase three will entail a final screening process to determine those sites which will be most profitably managed as TMZs, while maintaining the landscape scale ecological function and diversity. A ten-year timber management plan, which will direct the implementation of the new program, was completed in December 1997. The fourth phase, implementation, began in 1998.

❖ *Wildlife Management.* This program includes the identification and documentation of certain key wildlife species on or near District-owned lands, implementation of management strategies to assure quality habitat and the proliferation of those species, and the control of nuisance or exotic species.

Approximately 39 percent of the land under the District's stewardship are under Wildlife Management Area (WMA) status in cooperation with the Florida FWCC. On these lands, the hunts afford some measure of feral hog and game species population control, while providing public outdoor recreation. On un hunted lands where feral hogs are a problem, trapping contractors may be employed. In 1997, staff conducted a Districtwide assessment of those District lands that hold the potential for public hunts. Using detailed criteria established by staff, these lands were ranked as to the degree of need for wildlife population management hunts and their ability to sustain public hunts. The key wildlife populations were surveyed on the top-ranked lands to gather data on population size, demographics and vigor. From this effort, three additional tracts were identified as conducive to quality hunting programs: Green Swamp West, Lake Panasoffkee and Potts Preserve. In cooperation with the FWCC, these lands were made available for hunting in the fall of 1999.

❖ *Resource Monitoring.* In order to maintain habitat diversity and integrity, it is essential for land managers to have sufficient information about key plant and animal populations occurring on the lands and how they function and interact within the landscape. In this program, staff investigate key plant and animal populations on District lands to determine the overall condition of the natural community. More detailed monitoring of the populations is conducted periodically to gauge their health and response to management treatments. This knowledge, combined with review of the latest scientific information on management methods, assures that land management strategies are achieving the highest level of natural systems protection and function.

2. Regulatory Programs

A number of the District's regulatory programs contribute toward natural systems management. These regulatory programs are governed by Chapter 373, F.S., and have been implemented through specific rules, including 40D-2, F.A.C., (Consumptive Use Permitting); 40D-4, 40, and 400, F.A.C. (Environmental Resource Permitting); and 40D-8, F.A.C. (Minimum Flows and Levels).

Each of these regulatory programs are described in other parts of this Plan, but the contribution each makes to natural systems management is briefly described here. The intent of the Water Use Permitting Program is to limit impacts to natural systems by evaluating and controlling surface and groundwater withdrawals that can result in impacts to lakes, streams and wetlands. The Environmental Resource Permitting program deals with surface water management impacts to natural systems from development projects such as roads, shopping centers and residential communities. Impacts to surface waters and wetlands, unless specifically exempted, must be eliminated or reduced and, if unavoidable, mitigated. Types of mitigation can include wetland creation, restoration, or preservation, as

well as upland preservation. Any combination of these types of mitigation can be applied, depending on the circumstances involved. The intent is to replace the functions of the impacted natural systems, whether involving water quality treatment, flood protection, wildlife habitat retention or other factors.

The purpose of the Minimum Flows and Levels Program is to establish and enforce threshold water levels and flows that will prevent significant environmental harm. The Minimum Flows and Levels Program described in detail in subsection 8. below, had extensive revisions proposed in late 1998 and was the subject of independent peer review through the fall of 1999 as it relates to specific minimum flows and levels for the northern Tampa Bay area.

In addition to these individual District regulatory programs, the District also participates in DEP's Ecosystem Team Permitting process. "Team Permitting" combines the applicant, all regulatory agencies and concerned parties in a process that results in a comprehensive review of large, complex permitting projects. While this process is optional at the discretion of the applicant, and individual permits may still be issued by the respective regulatory agencies, this new approach to permitting has a guiding goal of providing net environmental benefit.

3. Surface Water Improvement And Management Program (SWIM)

The SWIM Act of 1987 (373.451-4595, F.S.) was enacted in response to growing concerns over continuing declines in water quality within the state's regionally significant surface water bodies and associated degradation of natural systems. The functions to be maintained or improved were identified in the SWIM Act and include: providing aesthetic and recreational pleasure for the State's citizens; habitat for native plants and animals, including endangered and threatened species; and safe drinking water for the State's

growing population, as well as attracting visitors and accruing other economic benefits.

The Act mandated that priority be given to Tampa Bay and its tributaries, as one of the six water bodies identified in the enabling legislation. The Act also required that each of the five water management districts prepare and submit for State approval a prioritized list of water bodies of regional or statewide significance within their boundaries. The District has identified, and the State has approved plans for ten priority water bodies (see Figure 26):

1. Tampa Bay
2. Rainbow River
3. Banana Lake
4. Crystal River/Kings Bay
5. Lake Panasoffkee
6. Charlotte Harbor
7. Lake Tarpon
8. Lake Thonotosassa
9. Winter Haven Chain of Lakes
10. Sarasota Bay

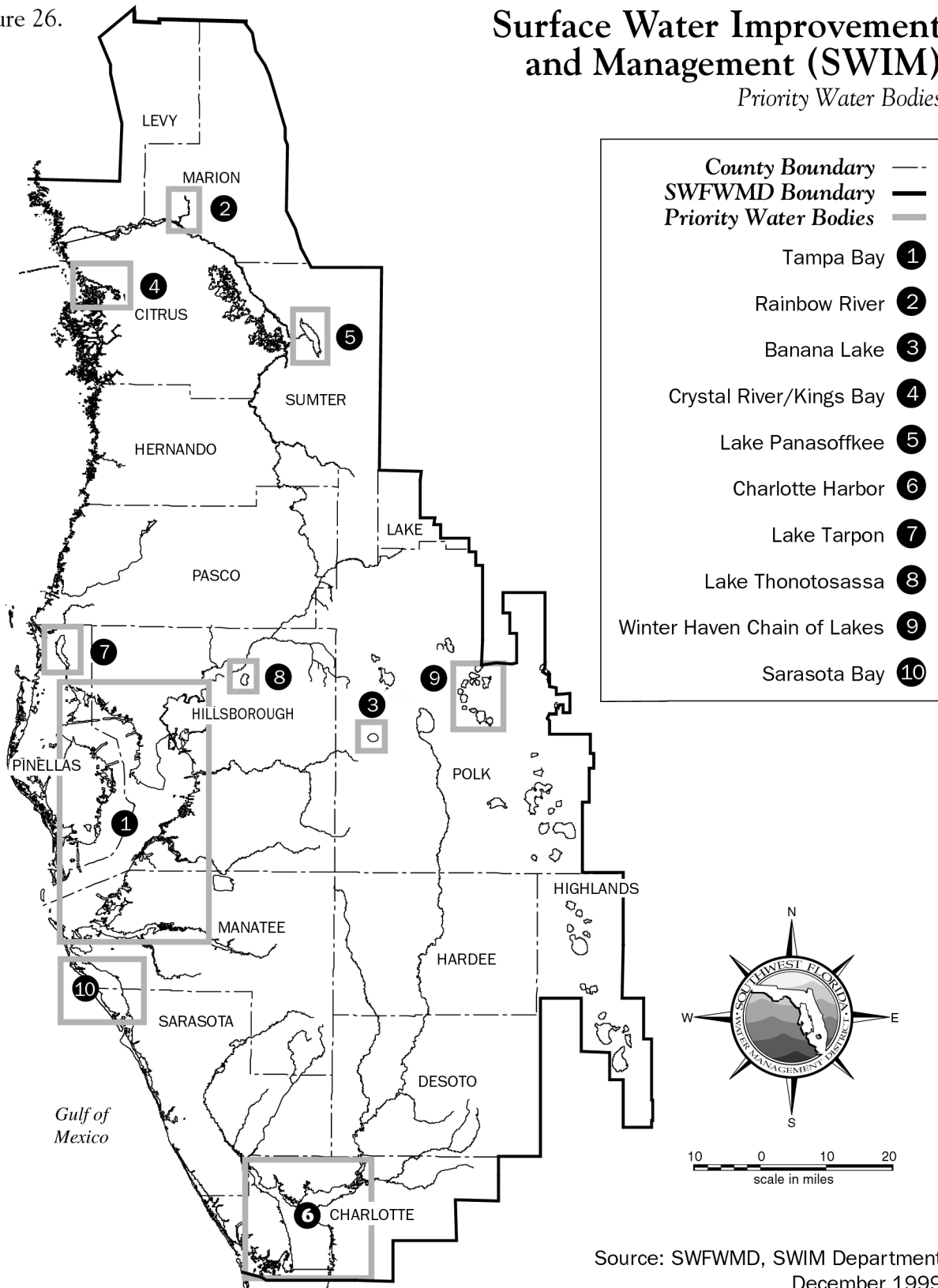
The SWIM process calls for preparation of management plans for each priority water body. SWIM plans are action-oriented documents; they are intended to serve as a guide to District staff and local governments (a willing and capable partner) in restoration and protection efforts for the priority water bodies. One example is the inclusion of Pollutant Load Reduction Goals (PLRGs) in each SWIM Plan (see [Water Quality](#) section). Management plans have been adopted for all ten of the priority water bodies, and work is underway on each.

The SWIM Program is involved in a wide range of activities to implement its plans. Tampa Bay has been the focal point of the District's SWIM program activities, having been identified as the number one priority water body for preservation and restoration. Significant research, resources and remedial actions have also been directed at the District's other ranked priority water bodies.

Figure 26.

Surface Water Improvement and Management (SWIM)

Priority Water Bodies



Source: SWFWMD, SWIM Department
December 1999

The SWIM Program has undertaken a wide variety of activities, including habitat restoration and stormwater improvement projects, environmental assessments, seagrass mapping, model ordinance development, wildlife assessments and lake rehabilitation (e.g., as at Banana Lake in Polk County).

Substantial progress has also been made on other priority water bodies, including, most recently, Lake Thonotosassa, where the creation of a freshwater marsh system is underway to improve water quality in the lake and provide associated habitat for fish and wildlife. In addition, for Lake Panasoffkee the legislatively created Lake Panasoffkee Restoration Council has created a coordinated strategy among State agencies, local governments, citizens and the District to undertake a \$26 million restoration strategy, and resulted in an update to the adopted SWIM Plan for the water body.

It is expected that as ranked water bodies are successfully addressed by the SWIM Program, additional water bodies will be added. The District is presently required to periodically review SWIM priorities. The process to accomplish such additions will build on the previous participatory efforts undertaken to identify the most regionally significant surface water bodies.

Funding for the program was initially based on a funding formula of 80 percent state and 20 percent District match. This has since been altered to a 60-40 arrangement, and in recent years a decreasing amount of state appropriations have been made available. The District's Basin Boards have provided solid funding support for the SWIM and related programs for several years. It also appears the Florida Forever legislation may offer the assured funding that is needed to maintain progress in the SWIM Program, at least for a ten-year period.

4. Diagnostic Feasibility Assessments (DFAs)

These studies are outgrowths of the SWIM Program and are designed to identify the nature and extent of pollution to selected water bodies and recommend cost-effective remedial actions through the development of a management plan. The District and its Basin Boards have funded a wide array of DFA projects, including those for lakes Maggiore and Seminole in Pinellas County, Parker, Hollingsworth and Marianna in Polk County, Little Lake Jackson in Highlands County, Clear Lake in Pasco County, and Lake Tsala Apopka in Citrus County. Additionally, similar studies have been undertaken for the Weeki Wachee River in Hernando County and the Chassahowitzka River in Citrus County. Additional discussion of this program can be found in the [Water Quality](#) section.

5. Aquatic Plant Management

The protection and management of natural surface waters cannot be accomplished without effectively managing troublesome exotic aquatic plant species. Due to their rapid growth rates and choking growth form, species such as water hyacinth, hydrilla and water lettuce have the ability to reduce the abundance and diversity of beneficial native plant populations, negatively impact fish and wildlife habitat, hinder navigation and recreational utilization, degrade water quality, impede water flow and increase sedimentation rates. Aquatic plant management operations conducted by the District on publicly accessible natural waters are funded and/or coordinated with the Department of Environmental Protection, the FWCC, the U.S. Army Corps of Engineers (COE) and local governments since this operation provides recreation, navigation, water quality, flood control, fish and wildlife protection benefits, as well as maintaining waterfront property values. The District's Basin Boards also provide funding in some instances.

Additionally, the District Aquatic Plant Management Section has been required to respond to the invasion of native plant communities on District-owned lands by exotic plant species. Exotic plant infestations have the potential to destroy the biological integrity of the areas the District has purchased to protect and preserve. This statewide problem is recognized as a primary threat to the remaining natural areas in Florida. Nearly all District-owned lands are infested to some level. Exotic species thrive where they are free from natural pests and diseases, and displace native species, disrupt natural ecosystem processes such as fire ecology, and diminish the amount of suitable habitat for native wildlife species. Control operations are closely coordinated with Land Management Section staff, and funding for these operations is obtained through the SOR (WMLTF) program.

6. Comprehensive Watershed Management (CWM)

The CWM initiative is of particular importance in addressing the management and protection of natural systems because it takes a holistic, ecosystem-based approach to the District's eleven major watersheds. This approach is comprehensive because it allows consideration of all aspects of natural systems, including linkages and Greenways. For further discussion of the CWM program, see the Watershed Management section of this Plan.

7. Local Government Planning Assistance

The District has a local government planning assistance program which, in part, contributes to protection of natural systems through such elements as providing Geographic Information System (GIS) mapping data and information on District land acquisition and management efforts that can lead to potential partnerships and related activities. This program is described in the Water Supply chapter.

8. Minimum Flows and Levels (MFLs)

Maintaining minimum flows and levels is a statutory charge for Florida's water management districts. The District's pertinent programs relative to minimum flows and levels originate in Chapter 373.042, F.S., as well as from the District's desire to treat the environment as a rightful "user" of water. If water resources and associated natural systems are to be protected and maintained, the identification and establishment of water levels and flows is essential. Such activities will also serve to balance water withdrawals for human needs with protection of surface water levels for navigation, recreation and related functions.

The term minimum flow refers to the limit in a watercourse at which further withdrawals would be significantly harmful to the water resources or ecology of an area. Similarly, "minimum water level" is statutorily defined as the level of ground water in an aquifer or surface water (e.g., a lake) at which further withdrawals would be significantly harmful to the water resources of an area. Both minimum flows and levels are to be based on "the best information available" (373.042, F.S.), and typically require development of a sound scientific basis as one step in establishing an appropriate balance between the needs of humans and natural systems.

A "Minimum Flows and Levels Priority List and Schedule" of water bodies for which the District plans to establish MFLs is submitted annually to the Florida DEP for approval, and published in the Florida Administrative Weekly. Inclusion of water bodies on the Priority List (see Figure 27) is "based upon the importance of the waters to the state or region, and shall include those waters which are experiencing or may reasonably be expected to experience adverse impacts" (373.042, F.S.).

Figure 27.

1999 Minimum Flows and Levels Priority List and Schedule

2000 (1)

- Hillsborough County lakes (Calm, Hobbs, Starvation, Church/Echo, Crenshaw, Cypress, Fairy, Halfmoon, Helen, Ellen, Barbara, Round, Raleigh and Rogers)
- Pasco County lake (Big Fish)

2001 (1)

- Southern Water Use Caution Area (SWUCA) (Floridan aquifer)
- Upper Peace River
- Tampa Bypass Canal
- Sulphur Springs
- Alafia River (includes Lithia and Buckhorn springs) (2)
- Pasco County lakes (Bird, Moon, Linda and Pasadena)
- Hernando County lakes (Hunters, Lindsey, Mountain, Neff, Spring and Weekiwachee prairies)
- Polk County lakes (Eagle, McLeod, Wales, Clinch and Crooked)
- Highlands County lakes (Lotela, Letta, Placid and Jackson)

2002-2005 (1)

- Intermediate aquifer (SWUCA) (where deemed technically feasible) (3)
- Little Manatee River system (4)
- Upper Hillsborough River system
- Weekiwachee River system
- Manatee River system
- Braden River system
- Middle Peace River system
- Lower Peace River Estuary system (includes Shell, Horse and Joshua creeks)
- Citrus County lakes (Tsala Apopka and Marion)
- Sumter County lakes (Panasoffkee, Big Gant, Deaton, Miona and Okahumpka)
- Hillsborough County lakes (Strawberry, Reinheimer, Wimauma, Platt, Mound, Allen, Harvey, Charles, Jackson, Garden, Taylor, Saddleback and Dan)
- Pasco County lakes (Padgett, Parker aka Ann, Green, Bell, Clear and Hancock)

2006-2010 (5)

- Lower Withlacoochee River system (Lake Rousseau/Rainbow Springs)
- Middle Withlacoochee River system
- Upper Withlacoochee River system (Green Swamp)
- Highlands/Polk Surficial aquifer
- Anclote River system
- Brooker Creek
- Pithlachascotee River system
- Myakkahatchee Creek (Big Slough)

2011 - 2015 (5)

- Myakka River system
- Crystal River system
- Homosassa River system
- Chassahowitzka River system

-
- (1) Wetlands and lakes may be added at the discretion of the District based on data availability, need and staff time. In the event access to a lake is denied by a property owner(s), the lake will be deleted from the list.
- (2) The District intends to expedite the analyses necessary to set this minimum flow.
- (3) The Sarasota County Intermediate Aquifer will be given priority during this timeframe.
- (4) A "River System" refers to the unique, watershed-based aspect of flowing watercourses and may include analysis of springs, tributaries, lakes, wetlands and aquifers, as appropriate.
- (5) Lakes during this period will be selected at a later date based on policy decisions related to priority areas.
-

The scientific methodologies used by the District for establishing minimum flows and levels, particularly in the northern Tampa Bay area, have been the subject of much discussion. Numerous affected parties have been involved in developing the methods to determine the limit at which significant harm occurs to the lakes, wetlands, surface water courses and aquifers of the area. The District's methodologies are summarized in the "Northern Tampa Bay Minimum Flows and Levels White Papers" (March 19, 1999), which are hereby incorporated by reference into this plan. The District intends to incorporate voluntary scientific peer review into all future minimum flows and levels establishment efforts.

The District's current Minimum Flows and Levels Program can be divided into three components, including the establishment of (1) minimum flows for streams, rivers and other flowing watercourses, (2) wetland and lake levels and (3) aquifer levels. Each of these components is described below.

(1) **Minimum Flows.** The SWFWMD approach to managing withdrawal-related impacts to streams and other flowing watercourses involves two management components: implementation of withdrawal limits in water use permits, and minimum flow rules for a watercourse that are established by the Governing Board after a formal hearing and adoption process.

Hydrologic and environmental analyses are conducted to assure that all water use permits meet the District's regulatory conditions of issuance. These conditions require that adverse impacts to the water resources and natural systems not occur as a result of the withdrawals. Based on these analyses, regulatory withdrawal limits are developed for each water use permit to prevent such impacts from occurring.

Withdrawal limits required in water use permits. Withdrawal limitations are established in water use permits which specify pumpage rates that cannot be exceeded when withdrawing water from a stream or other flowing watercourse. These quantities are typically expressed as average rates of withdrawal that cannot be exceeded over different time periods. For some water use permits, regulatory cutoffs are also required which require that withdrawals must cease completely when flow in the source stream goes below a specific rate.

In some cases, environmental monitoring programs are required as part of issued water use permits. The results of such monitoring programs can be used to modify water use permits if the results indicate that unforeseen adverse impacts result or appear imminent as a result of withdrawals. Extensive environmental monitoring programs have been required for water use permits for withdrawals from the Peace, Manatee, Hillsborough, and Braden rivers plus, the Tampa Bypass Canal and Shell Creek.

Minimum flow rules. Minimum flow regulations for a surface watercourse may be established by rules that are adopted by the District Governing Board as part of a formal hearing and adoption process. Minimum flow rules are published as part of the District's Water Levels and Rates of Flow Rules (Chapter 40D-8, F.A.C.). Such rules apply to all existing and potential users of a specific watercourse, and specify the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area.

Minimum flows for the Lower Hillsborough River and the Tampa Bypass Canal at Structure 160 were adopted by the District Governing Board during 1999. These rules, however, are being reevaluated based on the results of scientific peer review that was requested by various parties after the rules were adopted.

As part of the technical process for establishing minimum flows, the District is forming an independent scientific review team to review the proposed methods for minimum flows establishment. The District is presently forming such a review team for the water bodies scheduled for minimum flows adoption by 2001.

(2) **Wetland and Lake Minimum Levels.** Since the 1970s, the District has maintained a program to adopt management water levels for lakes within District boundaries. The objective of this program, which has evolved into the Lake Levels Program, has been to identify a series of water levels for each lake that will promote the maintenance of biological and physical systems integrity, and that can be used for regulatory and resource management purposes. Data collection and compilation in support of this program has included biological, chemical, physical and hydrologic information on over 400 lakes. Prioritization of lakes for adoption of management levels has been based on the location of District water control structures, water use permits and lake size. Based on rules adopted by the Governing Board in 1978, minimum water and flood levels have been adopted for over 400 lakes. Lake stage information collected for lakes with adopted levels is used to support District regulatory and environmental programs and local government programs concerning land development, floodplain delineation and zoning.

In response to legislative revision of Section 373.042, F.S., in 1996, the District initiated the development of new rules for establishing management water levels for lakes and wetlands within its jurisdiction. The resulting proposed minimum levels, approved by the Governing Board in October 1998, are specific to cypress swamps and cypress swamp-fringed lakes in the northern Tampa Bay area. Based on the proposed rules, minimum water levels have been developed for 36 wetlands and 15 lakes. Final adoption of the proposed rules and water levels is contingent upon the results of a review of the methods associated with the proposed rules by a

panel of non-District scientists. Methods for establishing minimum and guidance water levels on other wetlands and lakes are presently being developed for incorporation into District rules.

(3) **Minimum Groundwater Levels.** The District's development of minimum groundwater levels is intricately tied to the ongoing Water Resource Assessment Projects (WRAPs) discussed in the Water Supply section. The focus of these efforts is to identify and implement safe yield through a comprehensive approach that includes planning, technical analyses and effective regulation. This is intended to result in an integrated, comprehensive strategy for establishment of minimum groundwater levels.

Minimum groundwater levels are established to protect surface features, such as wetlands and lakes, from excessive groundwater withdrawals and to protect aquifers from regional saltwater intrusion. Minimum groundwater levels for the northern Tampa Bay region were adopted in 1998. Minimum groundwater levels are planned for establishment in the Southern Water Use Caution Area by the end of 2001.

Section 2. Issues Assessment

The District is constantly striving to advance its knowledge of the natural hydrologic system and human influences on this system. Through enhanced knowledge, the District can move forward in improving water resource management. It is fundamental that the District should always be striving to improve the effectiveness and efficiency of its resource management efforts. District initiatives such as the land acquisition and management and establishment of MFLs, as previously described, are prime examples of this improvement process. One of the main purposes of this Plan is to provide a mechanism whereby the District can identify areas for potential improvement and develop specific recommendations to achieve these improvements.

The major Natural Systems issue developed through these efforts is described below.

1. Protecting Water Resources as Components of Integrated Ecosystems

Components of this issue include:

- a. Establishment and Implementation of Minimum Flows and Levels
- b. Land Acquisition and Management
- c. Coordinated Strategy to Address Land Use Impacts
- d. Upper Myakka River Watershed Tree Mortality
- e. Development and Implementation of Invasive Exotic Plant Control Strategies
- f. Withlacoochee Watershed Strategy

For this issue, action plans are ultimately identified in the Implementation Strategies section.

2-1 Protecting Water Resources as Components of Integrated Ecosystems

Ensuring the long-term sustainability of Florida's water resources and associated natural systems is at the heart of the Florida Water Plan and this Plan. In the southwest District, this effort has emphasized evolution of the CWM initiative, establishment of minimum flows and levels in a priority fashion and the strategic acquisition and proper management of lands that serve multiple purposes for public benefit. Continued success will require working even more closely with the state, local governments, regional entities and others to create a shared vision of our environment as an integrated system.

Establishment and Implementation of Minimum Flows and Levels remains an important issue as it relates to all aspects of the District's program (minimum flows for streams and rivers, lake levels and groundwater levels). Annual updating of the Priority List and

Schedule, in coordination with regional water supply planning and the Five-Year Water Resources Development Work Program, will assure emphasis on water bodies used, or proposed for use, as water supply sources. Independent scientific peer review will be made an integral part of the MFL establishment process so that delays in activating protection can be avoided without negative implications for due process. The District must continue to work closely with affected parties and the public to develop prevention and recovery strategies that maintain water supplies and assure long-term protection of the sources involved. Continued emphasis on surface and groundwater bodies in the SWUCA and the Northern Tampa Bay WUCA will maintain the focus on the resources of greatest concern.

Land Acquisition and Management as a continuing issue involves making optimum use of the new Florida Forever program to protect (through both fee simple and less-than-fee techniques) the remaining high priority lands in the District, as well as addressing competing uses of District lands. Increasing population growth in the state is placing even greater pressures on those lands to meet an increasing array of public use demands. These uses include both consumptive and non-consumptive public recreation; public infrastructure, such as transportation and utility corridors; and sustainable resource utilization, such as timber management and cattle grazing. The rapid increase in pressure for services from the lands threatens to degrade the natural values and other functions for which the lands were acquired. The District must work in concert with other land management agencies and public and private entities to develop a more uniform approach for determining multiple use carrying capacities for the lands. Efforts should be increased to develop comprehensive programs to communicate to the public the purposes for which lands are acquired, what public uses are available and the importance of natural systems protection in the decision-making process.

The issue of developing a **Coordinated Strategy to Address Land Use Impacts** is double-edged. It encompasses both the effects of private land use impacts on lands adjacent to District properties and the restoration of impacted or altered natural systems, typically on District-owned sites. The former must utilize effective partnerships with the region's many stakeholders, both private and governmental, to address existing and future impacts on the public investment. The latter aspect is even more complex. The District is responsible for the restoration of impacted or altered natural systems on a number of fronts (from the SWIM Program, to Land Resources Department restoration of altered sites on lands acquired for water resource/natural resource protection, and mitigation plans associated with DOT compensation). This increased emphasis on restoration poses challenges in choosing the most worthwhile and cost-effective projects, as well as long-term obligations relating to monitoring and maintenance of those sites to ensure success.

Upper Myakka River Watershed Tree Mortality reflects the need to correct the water resource imbalance affecting a portion of the watershed in Manatee County known as the Flatford Swamp. The Swamp is an area of mostly hardwood swamps and marshes at the confluence of seven tributaries to the Myakka River that drains an area of about 85 square miles. The District owns about two-thirds (or 2,400 acres) of the Swamp area. A 1998 study determined that excess water, primarily from groundwater irrigation, has resulted in tree stress and deaths. In recent years, flows during the typical dry season have increased and the continuous presence of water without a drying-out period has proven fatal for many trees.

Development and Implementation of Invasive Exotic Plant Control Strategies reflects the fact that invasive exotic plants pose a significant threat to Florida's natural areas, both terrestrial and aquatic. As a major public landholder and manager of natural lands, the District must

cooperate with others (including state, federal and local governments) to develop effective invasive plant control and management strategies. For example, the SFWMD and SJRWMD have funded studies to develop biological and other control methods for melaleuca, Brazilian pepper and other invasive plant species that affect their lands. These efforts will ultimately benefit the District since these infestations also affect public lands in the SFWMD. Likewise, District and privately owned lands in the northern portion of the District harbor significant infestations of skunk vine. The District has funded two studies, including one on possible biological control methods, to increase our knowledge and ability to control skunk vine using the most environmentally sound methods available. It will be necessary for SFWMD to actively coordinate, support and fund appropriate studies to ensure that appropriate control methods, including one for skunk vine, can be developed.

The need for an overall **Withlacoochee Watershed Strategy** results from a number of related components in the northern reaches of the District. Collectively they represent a good example of how the District must balance flood protection with desired water levels, and natural systems restoration with water conservation. Included are potential reinstallation of the Wysong Dam, Lake Panasoffkee restoration and the District's role relative to the State-owned Inglis Lock on the Cross-Florida Greenway. Other aspects of this complex issue include assuring protection of the Green Swamp, implementation of the Lake Tsala Apopka Management Plan recently completed in cooperation with Citrus County and working with DEP and others to resolve sovereign lands concerns on such District properties as Potts Preserve and Flying Eagle. The U.S. Army Corps of Engineers has initiated the early stages of a watershed study, the objective of which is to "determine the feasibility of measures related to comprehensive watershed planning for water conservation, water supply, environmental

restoration and protection, and other water resource related problems in the vicinity of the Green Swamp and the Withlacoochee River.” (U.S. House of Representatives Resolution 2544).

Section 3. Water Management Policies

The following policies provide long-range guidance to the District in fulfilling its statutorily-based natural system management responsibilities. These policies express the position or strategy of the District that will be applied consistently in response to various resource management issues. In this case, “District” refers to the Governing Board and Basin Boards, since both make funding and other decisions in the best interest of the resource.

These policies may be implemented only to the extent that financial, staff or other necessary resources are available, pursuant to the budgetary actions of the Governing Board and Basin Boards. These policies do not create any regulatory authority and may require rule making as one component of their implementation. The policies contained within the Plan shall be reasonably applied where they are environmentally, technically and economically feasible. These policies shall be construed and applied as a whole, in recognition of the policies within all areas of responsibility within the Plan, and no specific policy shall be construed or applied in isolation from the other policies in the Plan.

3-1 Ecosystem Policies

It is the policy of the District to:

1. Use an integrated approach to the management and protection of southwest Florida’s natural systems through the use of tools such as planning, land acquisition, restoration, environmental education, regulation and pollution prevention.
2. Emphasize avoidance and minimization of adverse impacts to natural systems before considering mitigation.
3. Adopt a comprehensive resource protection approach in recognition of the interconnected relationships between the quality and quantity of surface water, groundwater, aquatic and upland resources and the cumulative effects of activities which affect them.
4. Avoid the destruction of threatened, endangered and species of special concern, and seek to ensure the protection of their habitats.
5. Promote the restoration of hydrologic and ecologic functions of degraded or substantially disrupted surface and groundwater systems.
6. Manage the waters in the District to conserve and protect natural resources and their scenic beauty and to realize the sustainable, beneficial use of the resource.
7. Protect the natural water storage and water treatment functions of wetlands and floodplains through land acquisition, regulation and land and water management.
8. Protect, maintain and restore the functions of natural systems in the implementation of District surface water programs.
9. Eliminate the discharge of inadequately treated stormwater into receiving water bodies.
10. Address stormwater management on a watershed basis so as to reduce stream channel erosion, pollution, siltation, sedimentation and flooding; and to reduce the consumption and loss of freshwater resources by encouraging the reuse of storm water.
11. Use and mimic natural water systems as the optimum design for surface water management systems.
12. Strive to manage water resources to achieve no net loss of wetlands.

13. Identify, acquire and manage public lands necessary for effective water management, including:
 - natural water conveyance and storage;
 - preservation or restoration of natural systems;
 - groundwater recharge;
 - water supply;
 - wildlife habitat;
 - establishment and connection of Greenways;
 - the conservation and protection of water resources.
14. Support the identification, evaluation and protection of archaeological and historic resources, including those on District-owned lands.
15. Encourage compatible recreational activities on District-owned lands.
16. Support regional and local growth management plans that achieve natural systems protection by providing buffers and linkage corridors, among other methods.
17. Encourage and support land use decisions that do not adversely impact water quality, quantity or natural systems.
18. Manage invasive exotic plant and animal species on District-owned lands and on public waterways to protect and preserve native plant communities, fish and wildlife habitat, water quality and the recreational use of surface waters.
19. Encourage compatible land uses adjacent to District-owned lands in order to protect the hydrologic and environmental functions of such lands.
20. Coordinate District land acquisition and management with that of local governments and others.
21. Support the use of alternatives to fee simple acquisition (e.g., conservation easements), where appropriate, to protect lands with important water management functions, make efficient use of acquisition funds, and sustain agriculture, silviculture and other economic uses of land.

3-2 Minimum Flows and Levels Policies

It is the policy of the District to:

1. Reserve from use in such locations, times and quantities, that water necessary to support essential natural systems functions and values, including navigation, recreation and the protection of fish and wildlife.
2. Establish minimum flows and levels for surface and groundwater systems to protect water resources and the ecology of the area from significant harm.
3. Prevent changes in flows that would cause unacceptable adverse impacts to hydrology, water quality and natural systems.
4. Manage stream withdrawals from a watershed perspective and, where feasible, locate major withdrawals at sites that optimize available supplies and minimize environmental impacts.
5. Protect the ecological functions of water-dependent natural systems through regional water management plans.
6. Utilize voluntary scientific peer review in the development of minimum flows and levels.

Section 4. Implementation Strategies

Implementation strategies are the means through which the District responds to identified issues to improve water resource management. They are the synthesis of all our planning. Within this section, implementation strategies are described for all of the District's major natural systems issues previously identified. The format includes, as appropriate, tasks, schedules and identification of responsible entities. It is important to remember that many of the District's existing programs serve as the foundation for responsive strategies, e.g., land acquisition and management as it relates to protection of water resources and related natural systems.

4-1 Protecting Water Resources as Components of Integrated Ecosystems

Task 1: Establish and implement MFLs on an ongoing basis for flowing watercourses, lakes and ground water according to the adopted Priority List and Schedule, including all appropriate prevention and recovery strategies.

Responsible Entity: District Resource Conservation and Development, Technical Services and General Counsel departments; Governing Board.

Task 2: Implement the Northern Tampa Bay Recovery Strategy by 2010, utilizing the appropriate “tools in the tool box,” and addressing recommendations of the Northern Tampa Bay Peer Review Panel. (See Water Supply, Task 13)

Responsible Entity: District Executive, Resource Regulation, Resource Conservation and Development and General Counsel departments.

Task 3: Update the MFL Priority List and Schedule annually by November 15, and publish no later than the following January 1, in the Florida Administrative Weekly.

Responsible Entity: District Executive, Planning, Resource Conservation and Development, General Counsel departments; Governing Board.

Task 4: Develop a standardized MFL Peer Review process to assure timely, scientifically sound establishment of flows and levels for streams, lakes, wetlands and aquifers by October 2000.

Responsible Entity: District Executive, Planning, Resource Conservation and Development, General Counsel departments; Governing Board.

Task 5: Complete Water Resource Assessment Projects and Regional Water Supply Plan to assure appropriate Natural Systems protection (see Water Supply strategies).

Responsible Entity: District Resource Conservation and Development Department.

Task 6: Implement all needed changes to the District’s land acquisition and management program for transition to the Florida Forever Program by July 1, 2001.

Responsible Entity: District Land Resources Department; Governing Board.

Task 7: Acquire all remaining high priority lands in the District within the next ten years.

Responsible Entity: District Land Resources Department; local governments; Governing and Basin Boards.

Task 8: Maintain schedule for developing land management plans for all District-managed properties on an ongoing basis.

Responsible Entity: District Land Resources Department; Governing and Basin Boards.

Task 9: Establish and coordinate a statewide effort by no later than 2002 to identify and implement “carrying capacity” for public lands, reflecting natural system integrity, public recreation and other uses on such properties.

Responsible Entity: District Executive, Land Resources, Resource Conservation and Development and Planning departments; other WMDs; DEP, et al.

Task 10: Update the District’s “Land Use Compatibility Analysis” by October 1, 2001 (including multiple-use analysis and a coordinated review of all District and other public lands in the region).

Responsible Entity: District Land Resources, Resource Conservation and Development departments; local governments.

Task 11: Continue and enhance public awareness programs related to Natural Systems, including a comprehensive update to the Recreational Guide by October 2000, and every two years thereafter, and completion of an updated edition of the District Plant Guide by June 2000.

Responsible Entity: District Land Resources and Communications and Community Affairs departments.

Task 12: Maintain and implement the District's 10-Year Natural Systems Restoration Plan, including statutory requirements related to DOT mitigation.

Responsible Entity: District Land Resources, Regulation, Resource Management departments; Governing Board.

Task 13: Participate in the implementation of the Lake Panasoffkee Restoration Plan, as appropriate, including updating of the SWIM plan for the lake by October 2000.

Responsible Entity: District SWIM Section (Resource Management Department); Governing Board; Lake Panasoffkee Restoration Council.

Task 14: Maintain the activity schedules of all ten individual SWIM plans on an ongoing basis, including appropriate use of Forever Florida and Basin Board funds.

Responsible Entity: Governing and Basin Boards; District Resource Management Department.

Task 15: Complete Comprehensive Watershed Management plans per the schedule contained in the "Common Issues" section of this Plan.

Responsible Entity: See Chapter 3A. Issues Common to All Areas of Responsibility.

Task 16: Complete a feasibility study by 2001, and assuming favorable results, actively coordinate, support and assist in funding a biocontrol project targeting skunk vine by 2005.

Responsible Entity: District Operations, Land Resources, Resource Conservation and Development departments.

Task 17: Cooperate with other stakeholders in the ongoing support and funding needed to develop effective and ecologically sound control methods for exotic plants in natural areas.

Responsible Entity: District Operations, Land Resources, Resource Conservation and Development departments; others.

Task 18: Implement a three-pronged approach to the Upper Myakka River Watershed issue aimed at restoring natural systems through removal and reuse of excess water in the most beneficial manner possible. This would include, but not be limited to:

- Data Collection (aerial mapping, continuing analysis of tree mortality, animal abundance, water quantity and quality, etc.)
- Regulation (enhanced irrigation management through permitting, compliance assessments, etc.)
- Non-regulatory means (incentive programs such as the pilot project for the Agricultural Conservation Partnership, land acquisition, etc.)

Responsible Entity: District Resource Management, Resource Conservation and Development and Regulation departments.

Task 19: Participate fully in the U.S. Army Corps of Engineers watershed study for the Withlacoochee River, including the ongoing Reconnaissance Phase (completion expected in 2000) and subsequent phases.

Responsible Entity: District Resource Management Department.

Section 5. Performance Measures

The District has an existing effectiveness measures initiative. The purpose of this effort is to develop methods to measure accomplishment of the District's mission and goals, provide regular trend information to decision-makers and create public awareness of District accountability. In effect, this process develops a picture of the "state of the resource" to assure adequate water supply, protection of water quality, flood protection and preservation of natural systems. It is discussed in greater detail in the Management Services section.

In addition, the District has been working with the Executive Office of the Governor and the Department of Environmental Protection to develop "core" performance measures for both budgeting and water management planning purposes. These are measures that all the districts have in common, with each district free to have additional measures as needed. Measures have been developed for each of the four major areas of responsibility (water supply, flood protection, water quality and natural systems), as well as for all four areas collectively. The entire set of measures developed is shown in the section of Water Management Goals and Policies, while those noted below are for natural systems only. In addition, the core measures previously portrayed in the District's 1998 District Water Management Plan Annual Progress Report are shown below (see Figure 28) as examples of how the measures will be graphically depicted.

5-1 Natural Systems Measures

Objective 1: Maintain the integrity and functions of water resources and related natural systems.

- a. Number of MFLs, by water body type, established annually and cumulatively.
- b. Number and percentage of established MFLs being maintained.
- c. Number and percentage of water bodies not meeting MFLs upon establishment that have:
 1. fully recovered, or
 2. partially recovered.
- d. Total acres of wetlands or other surface water authorized by environmental resource permit to be impacted and acres required to be created, enhanced, restored and preserved.

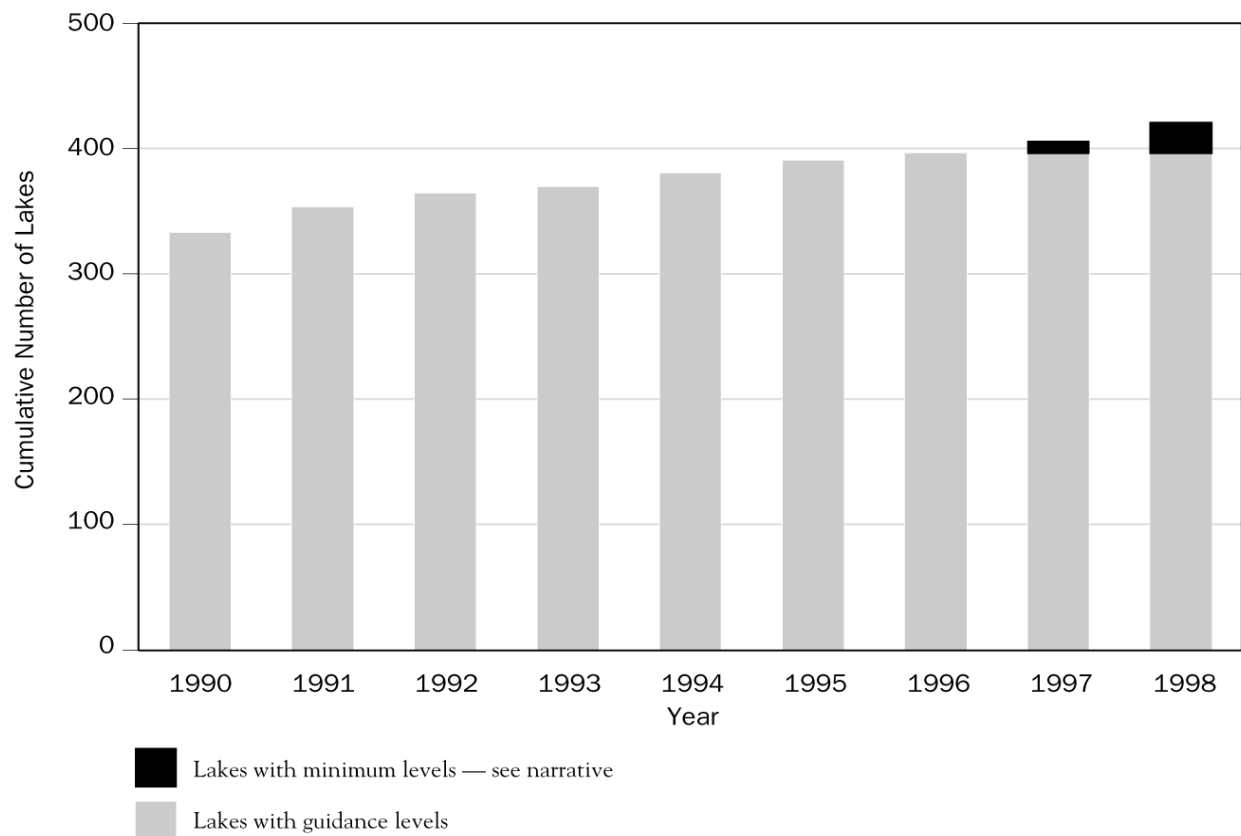
Objective 2: Restore degraded water resources and related natural systems to a naturally functioning condition.

- a. Acres of District-owned land in land management plans identified as needing restoration; acres undergoing restoration; acres with restoration activities completed.
- b. Acres of invasive nonnative aquatic plants in inventoried public waters.
- c. Acres of District-owned land infested with invasive nonnative upland plants, by species inventoried.

Figure 28.

Cumulative Number of Lakes with Established Minimum Flows and Levels

The District has been adopting lake levels since 1980, with about 400 lakes completed by 1997. Setting levels and flows ensures adequate water for the natural systems supported by these water bodies. With the recent adoption of MFLs in the Northern Tampa Bay area, the methodology for setting lake levels has changed. The 400 lakes previously addressed have “guidance levels” that remain useful for District and local government purposes, but will ultimately need to be readdressed in a priority fashion as to the new methodology.



Source: SWFWMD, 1999

Part F. Management Services

Introduction

This section of the District Water Management Plan is unique to the Southwest Florida Water Management District. All five districts have previously agreed on a common format and guidelines that encompass resource management and protection through analysis and planning for the four major "Areas of Responsibility (AORs):" Water Supply, Flood Protection, Water Quality Management, and Natural Systems Management. It was mutually agreed that these categories cover all the resource-based functions the districts undertake in the satisfaction of their mission. However, a fifth AOR has been identified at the SWFWMD that also contributes to the delivery of effective and efficient regional water resource management. That area is administration, or Management Services.

Section 1. Why a Management Services Section of the Plan?

During the process of developing this Plan, District staff were asked to identify "issues" and "needs" at the District. Identifying issues and needs leads to effective analysis of current practice, and provides direction for future planning. **Issues** are defined as something the District could do, or do better, to effect our mission. **Needs** are the means to address the identified issues. A large number of the issues identified Districtwide were of an administrative nature: management issues, facilities issues, etc. It became clear that to ensure the effective achievement of the organization's mission and goals, the internal workings of the District must be considered and included in the planning process. The following discussions are intended to assess the issues associated with Management Services at the District.

1-1 Management Services Defined

Management Services at the SWFWMD are made up of those departments, sections and functions that are for the most part **indirectly** involved with managing water resources. These efforts are necessary to carry out District responsibilities, but they typically deal with the internal operations, and internal/external communication functions of the agency. The departments described in, and that contributed to this chapter perform mostly administrative tasks. Exceptions are those that have some resource-based functions as well, such as data collection and management. The contributing departments are discussed below.

1-2 Management Services Goal

The Governing Board of the SWFWMD has reviewed and accepted the following Management Services goal for the District:

Ensure Management Services seek continuous improvement while effectively and efficiently providing the resources and assistance necessary to achieve the District's mission to manage and protect water and related resources.

1-3 Purpose of Section

The purpose of the Management Services section is to evaluate and establish direction for the internal functions of the District as a means of assuring effective and efficient administrative services. This section of the Plan provides an internal mechanism for sound support services, planning and management practices, and reflects those planning initiatives already underway. It is also a means to capture "administrative-type" initiatives at the District, or those that might be proposed, that cross all functional and programmatic lines, such as Work Force Diversity, Advisory Committees and others.

Development of this section has also afforded staff participation opportunities that might otherwise have been lost if Management Services departments were excluded. It is expected that the primary use of this section will be for internal performance purposes.

Section 2. Methodology

The basic approach taken to develop this chapter is the same as that used to develop the other AORs. Staff workshops, a standing steering committee and a traditional planning approach were all employed.

2-1 Departments Involved

Thirteen District departments or sections provided input to this process. The following departments or sections constitute Management Services at the District:

Planning Department
Boards and Executive Services Department
Office of Inspector General (Internal Audit)
Finance Department
Communications and Community Affairs
Department
Office of General Counsel
Human Resources Department
Records and Data Department
Information Resources Department
Risk Management and Safety
General Services Department
Resource Data Department

Representatives from each of these departments or sections comprised a Steering Committee formed to assist in developing this chapter. These representatives were responsible for producing department descriptions. The descriptions were instrumental in initiating committee discussion of pertinent Districtwide issues, crafting the following analyses, and identifying implementation strategies for the coming years.

2-2 Planning Approach

Like the initial four AORs, the Management Services section followed a series of planning steps. An effort was made to make these steps as comparable as possible to those of the other four. This should aid consistency and assure linkage of all plan components. The planning steps are:

1. Department Descriptions
2. Management Services Assessment/Issues
3. Management Services Guidelines
4. Management Services Strategies for the Future

Section 3. Department Descriptions

The roles and functions of Management Services departments are considerable and diverse. Discussions throughout this section describe the role of each department, how they vary, how they fit into the larger District perspective, and identify any issues associated with department roles and functions. The goals, plans and reporting measures of the various departments shown in Tables 6 - 8 reflect these differences and collectively further the District's mission.

3-1 Department Goals

Management Services departments typically provide administrative support to resource protection functions. Management Services departments may also provide direct resource support and will also be included in this chapter. An example is the Resource Data Department which combines research, data collection and database management. All Management Services departments have developed goals to guide their actions and departmental philosophy, as can be seen in Table 6.

Table 6. Management Services Department Goals

Department	Goal
Planning	To provide professional planning expertise and services to the Governing Board, Basin Boards, Executive staff and all departments at the District. Central to this mission is coordination with, and providing technical and planning assistance to local governments and other public and private organizations.
Boards and Executive Services	To provide a high level of professional, efficient support to the Governing Board, eight Basin Boards and the Executive staff in order to pursue the District's primary mission to preserve and protect water resources. Staff strives to communicate Executive's direction to other District staff, the Boards and the public and provides legal advertising and reporting to facilitate statutory requirements consistent with the public and member governments.
Office of General Counsel (OGC)	To provide high quality, timely legal support for all District needs and to assist in ensuring full compliance by the District with all applicable laws and rules.
Human Resources	To administer all aspects of the District's Human Resource Management program in accordance with applicable federal and state laws, generally accepted human resource management principles, such as diversity outreach efforts, and the current executive management philosophy.
Information Resources (IRD)	To provide technology-related consulting to the District staff, plan for continuous improvement, such as development of a Web site, and maintain existing investments to achieve the highest level of service at the lowest total cost. IRD provides the leadership in computing, communications and support required for the District staff to accomplish their tasks efficiently and effectively. An example is enhanced interface with recent changes in State permitting requirements.
General Services	<p>To provide facilities maintenance support, including utilities management, for all District facilities and real property.</p> <ul style="list-style-type: none"> • To provide maintenance support for District facilities and fleet services to all District-owned vehicles and other mobile equipment. • To manage the District construction and facility renovation program. • To provide printing, library, inventory and records retention functions. • To develop and maintain a planned program of capital expenditures to ensure the District has adequate facilities and equipment to meet its responsibilities.
Resource Data	<ul style="list-style-type: none"> • To collect, manage and provide timely and accurate water resource data and analysis to support the decision-making efforts necessary to accomplish the District's mission. The ROMP network and SCADA are a major part of this effort. • To establish and coordinate comprehensive water resource monitoring networks that are scientifically based and spatially representative of the resource parameters being monitored in part to support development of MFLs; • To work with the scientific community in order to predict future data needs and begin collection efforts now; • To integrate a comprehensive resource database with a user-friendly interface.
Finance	To develop effective program budgeting plans, accounting, purchasing, contracts, fixed assets programs and financial audits to the Executive Office of the Governor and other State and federal offices to ensure compliance with all laws and regulations governing the financial processes of the District and to effectively communicate these requirements to all District staff.
Office of Inspector General	<ul style="list-style-type: none"> • To collect and provide independent, relevant, reliable, and timely information to the District Governing Board and senior managers and help those District leaders decide whether District processes are effectively and efficiently meeting statutory requirements and District goals, objectives, and responsibilities. • To help District leaders design an action plan that will constructively address concerns or issues identified during audit activities.

Table 6. Management Services Department Goals (continued)

Department	Goal
<p>Communications and Community Affairs</p>	<p>To educate and inform the public about District responsibilities and activities, the interrelationship between Florida water resources and Florida living, and citizen and community roles in protecting and preserving water resources.</p> <p>To assist the community and all levels of government by:</p> <ul style="list-style-type: none"> • serving as the District’s outreach informational resource center for all customers; • fostering positive and reliable communications with federal, state and local governments and citizen groups; • implementing special projects and coordinating cooperative funding requests efficiently and effectively; • ensuring the public and governmental entities have a liaison for conveying resource messages and issues; • providing an ombudsman to enhance public access by receiving, investigating and reporting on comments and complaints from the public; • helping to develop and foster sound public policy on various water resource related issues.
<p>Risk Management and Safety</p>	<ul style="list-style-type: none"> • To protect the District, its personnel, property and financial assets from exposure to loss utilizing methods to reduce the frequency and severity of losses and to preserve the operational continuity of the District following any such loss. • To positively impact productivity using proactive programs of safety, ergonomics and a wellness initiative.
<p>Records and Data</p>	<ul style="list-style-type: none"> • Ensure accurate and timely administrative procedural aspects of permits, records, and data. • Collect, review, track, and report permit data in a timely and accurate manner to maintain an effective permit program. • Provide system planning, analysis and support; ensure data integrity and oversee integration of image technology development. • Coordinate and lead water shortage implementation. • Provide streamlined permit evaluation. • Assist in administrative permit related rule making and lead in water shortage rule making. • Effectively communicate and interact with all regulatory and other District departments and external agencies and entities.

3-2 Department Plans

There are numerous existing planning efforts in the various Management Services departments at the District. Many of these planning processes have resulted in plans that focus on and drive decisions for particular programs, entire departments or even Districtwide activities. It is important that these plans be recognized and used; e.g., in the District's annual budgeting process as they relate to affected departments.

It is informative to have a listing of these plans in one place (see Table 7) to allow, at a glance, the opportunity to comprehend the myriad of planning processes already in place within the District. A single-source listing enables budgeting, Districtwide planning, and other processes to ensure all relevant plans are captured.

Table 7. Management Services Department Plans

Department	Plans
Planning	District Water Management Plan Basin Plans
Communications and Community Affairs	Strategic Communications Plan, Education Work Plan Short-Term Organizational Plan Draft Action Plan Underlying Principle-District Service Representatives
Boards and Executive Services	Handbook of Policy and Procedures [Guidelines for Administrative Procedures]
Human Resources	Classification and Pay Plan Goals and Objectives, Internal Procedures Manual, Personnel Guidelines and Internal Procedures, Diversity Management Plan
Information Resources	IRD Five-Year Plan, Business Recovery Plan, Year 2000 Readiness Assessment Plan, Year 2000 Contingency Plan
General Services	District Capital Improvement Plan (CIP), Five-Year Major Construction Plan, Fleet/ Preventative Maintenance Schedule, Various Major Project Construction Management Plans, District Mailing Label System
Resource Data	Department Five-Year Plan, Mapping & Geographic Information System Five-Year Plan, Inter-District Guidelines for Data Collection Aerial Mapping, Well Plugging Work Plan Quality Assurance Project Plans, Five-Year Well Drilling Schedule Work Plan, Comprehensive Quality Assurance Plans (CompQAP), Supervisory Control & Data Acquisition (SCADA) System Action Plan
Finance	District's Five-Year Capital Improvement Plan, Annual Service Budget, Comprehensive Annual Financial Report, Budget in Brief
Office of Inspector General	Annual Audit Plan, Individual Audit Plans
Risk Management and Safety	Annual Plan of Action District Safety Guidelines Manual

3-3 Department Measures

District staff, sections, departments and programs are frequently awarded recognition for exceptional performance by professional organizations, as well as successfully meeting statutory, financial and other reporting and noticing requirements. The District also reviews and rewards individual performance annually as a way to monitor performance. There are numerous data collection efforts and other means to determine the performance or

effectiveness of District departments. Table 8 briefly references those used by the Management Services departments. A discussion of Districtwide Effectiveness Measures is contained in Section 2-4 below.

Table 8. Department Measures

Department	Measures
Planning	Meeting statutory reporting requirements, plans and reports Public, staff and other agency input Effectiveness Measures
Communications and Community Affairs	Evaluation tools including surveys, informal feedback, participant counts, behavioral change tracking, pre- and post-testing, and demand management Personal performance by Service Offices Opinion Surveys of District success of legislative initiatives
Boards and Executive Services	Statutory and procedural meeting and reporting requirements are met
Human Resources	Comparison with other agencies staffing and benefits Surveys and bench-marking Independent consultants conduct Pay and Benefit surveys Diversity outreach measurements
Information Resources	Quarterly reports on system functions Monthly reports on system resource use and how response times correspond to industry standards Requirement Statements and incident reports
Office of General Counsel	Monitor the status of enforcement cases and compliance settlements Track litigation, staff work requests, and rule making Maintains historical case records Assist staff in administrative contracts and land acquisitions
General Services	Monthly productivity statistical reports Fuel and vehicle utilization report Construction status reports Printshop outputs Library usage report
Resource Data	Maintain work order, data distribution, and map order databases Follow the SCADA Action Plan, Well Plugging Work Plan, and the Resource Data Department Quarterly Reports
Finance	Survey customer feedback Monthly Advantage Financial System Procurement evaluates requisition processing time Diversity purchasing outreach measurements
Office of Inspector General	Quarterly time budget to actual accomplishments Quarterly Performance Measures Survey Questionnaires
Risk Management and Safety	Effectiveness determined by loss ratios and overall comparative benchmark cost of risk to other public and private organizations
Records and Data	Exceptional and level of consistency analysis Graphs of work area production Water shortage variance reports and documentation

3-4 Existing Districtwide Initiatives

There are a number of programs and activities that cross department boundaries. Given the interdisciplinary nature of water resources, this is inevitable for the effective interaction of resource-based departments. Multi-departmental activities are also critical to the coordinated and productive operation of a substantial organization such as the District. Several Districtwide programs are examples of important Management Services efforts, including Work Force Diversity, Effectiveness Measures and Advisory Committees.

3-4.1 Diversity Initiative

The District is committed to the process of enhancing diversity in all areas of the organization. Diversity in the workplace is a work environment which "levels the playing field" through intensive outreach and retention efforts for all persons through policies and practices related to attraction, hiring, retention, and promotion that respect the racial, ethnic, gender, and other differences which influence the unique contributions each employee can make to the organization. A "culturally inclusive" individual is one who values other people's contributions regardless of their racial, ethnic, gender and other affiliations.

Formal outreach and reporting efforts related to work force diversity can be traced to 1990, when the District created a multi-cultural focus group. The purpose of this group of employee volunteers was to provide advice to Executive staff on ways to increase the representation of women and minority candidates in its applicant pool. In late 1991 and early 1992, Governing Board interest in this issue resulted in the creation of the ad hoc Governing Board Work Force Diversity Committee and a staff-level advisory District Staff Work Force Diversity Committee. The Governing Board Work Force Diversity Committee provided an important

"outside" perspective, as well as policy-level decisions, and the District Staff Work Force Diversity Committee provided research and policy development assistance to Executive and Human Resources departments on a wide range of diversity concerns.

The activities of these two committees resulted in an initial Diversity Survey being conducted in 1994. The results indicated diversity was an important issue to employees of the District, especially in the areas of recruitment, career advancement and retention. The first Diversity Management Plan was completed in 1995 to set forth the means to increase the awareness of District employees and further promote and embrace a work environment providing a "level playing field" and equal opportunity for all applicants, employees and vendors.

As a follow-up to the updated initiatives in the Diversity Management Plan, in 1998 the District's first comprehensive Diversity Action Plan and Statistical Update report was produced. This report contained many recommendations for enhancing and reporting on the diversity of the District's workforce, as well as its vendor base for the procurement of goods and services. Based upon the success of the first action plan, a second updated Diversity Action Plan was developed in February 1999. The Diversity Action Plans and Statistical Updates set forth specific activities to be accomplished in diversity education, outreach, recruitment and purchasing. The plan specifies the purpose of each recommended action item, states how the goals set forth will be achieved, and sets a timeframe for accomplishing each item. These action plans have contributed significantly to the ongoing refinement and advancement of the District's diversity efforts. The staff now report results back to the Governing Board as a whole twice a year.

3-4.2 Advisory Committees

The District has established a number of advisory committees to enable technical and professional input into District programs and activities from groups whose activities are impacted by the District. Committee members serve an outreach function, maintaining communication with members of their organizations, and conveying input from the organization to the District. In addition, the committees act as two-way educational forums disseminating information while advising and assisting the District in educational programs and projects. Board Policies establish and govern the advisory committees. Advisory Committee titles and enabling policies are:

Agricultural Advisory Committee
Policy Number 170-1

Green Industry Advisory Committee
Policy Number 170-4

Industrial Advisory Committee
Policy Number 170-3

Public Supply Advisory Committee
Policy Number 170-2

Environmental Advisory Committee
Policy Number 170-5

Alternative Water Supplies Grants
Advisory Committee
Policy Number 170-6

Well Drillers Advisory Committee
Policy Number 225-017

Additional ad hoc committees have been formed as needed, such as advisory committees specific to each water use caution area, informal “developer” advisory committees and the surface water management (e.g., consultant) advisory committee to assist in improving regulatory and other programs.

3-4.3 Effectiveness Measures

The District has a process to measure how well we are accomplishing our mission. The purpose of this process is to assure sound resource management and improve accountability to the citizens we serve. It is important to measure District effectiveness for a number of reasons. Such measures can provide a way to: spot potential concerns before they become crises; provide information for clear decision making; document to taxpayers and others that their dollars are being spent wisely; and coordinate effective resource management with other agencies.

Both “efficiency” (producing desired results with the least cost of energy, time, money or materials), and “effectiveness” (accomplishing what we intend to accomplish) are important considerations to the District. While this initiative emphasizes effectiveness, a two-pronged approach has evolved that includes District Accountability Indicators (DAIs, or “big picture” measures of our management) and Budgetary Performance Measures (BPMs, or department and “activity” measures) to address our efficiency and effectiveness. For example, the Quality of Water Improvement Program (well plugging) may use as a BPM the number of wells plugged in a year against their cost. This is an efficiency measure, whereas trends in water quality in areas where wells have been plugged is a DAI measure. This is a measure of effectiveness. This approach allows us to meet the needs of individual departments and programs and also to determine and communicate the quality of the District’s overall efforts in managing and protecting water resources.

A Report on Accountability is under development, will be completed by 2001, and describes this effort by illustrating DAIs for each area of responsibility. DAIs will be linked with the Program Budget process and used to show accomplishment of, or accountability for, the

District's AORs (water supply, flood protection, water quality, natural systems). The primary benefits of DAIs are to: allow the District to achieve, document and communicate its accountability; show trends in water resource issues; and provide information on where to best allocate our limited resources. Samples of DAIs have been included in each AOR chapter. BPMs will be used to assist departments in developing and justifying budget changes. These measures will use the Program Budget template to ensure a consistent format for budgeting, reporting and tracking.

Section 4. Management Services Assessment

Assessment and analysis of District management practices was a primary objective during the planning process for the Management Services section. An examination of how we do business, and identification of beneficial changes or additions, is essential to continuous improvement in our activities and services. Since Management Services functions support all other functions at the District, they must be effective and efficient so that we can deliver high quality service to the public, local and other governments.

The following portion of this chapter, derived from the "facilitated" workshops with the Management Services Steering Committee, provides an overview of the Management Services activities and issues associated with them. In order to provide some structure to the varied array of issues, five main categories have been developed. Each of these categories has primary themes that attempt to capture the numerous issues that have been identified by this process. The five issue categories include:

1. Communication and Accountability
2. Finances
3. Staff
4. Technology
5. Facilities

4-1 Communication and Accountability

Good corporate citizenship is a major goal of the District's Management Services, and emphasizes interactive communication and outreach efforts. Five geographically disbursed service offices provide local regulatory assistance in a convenient and efficient manner. Other District coordination efforts are discussed in the Implementation Coordination Chapter. Recycling of all possible materials used in agency business is another example of corporate citizenship. Current and/or historical recycling includes paper, pallets, waste oil, scrap metals, plastics, and old computers being donated to schools. Numerous staff participate in local voluntary activities with the support of the agency.

We are increasingly connected to state, national and international water resource managers. Such connectivity improves the transfer of technology both to and from the District and enables us to learn from others and to validate our approaches to water management. We are also continuously striving for better coordination with local governments on administrative matters. Examples of recent efforts to improve connectivity include:

- Co-location of the Venice service office with Sarasota County;
- Joint purchasing agreement with Pasco County;
- Potential co-location with the United States Geological Survey in the Tampa Service Office, as it is expanded;
- Co-location of Soil and Water Conservation District staff at the Bartow Service Office; and,
- Enhancing economies of scale by coordinating administrative activities internally.

The District recognizes there are other ways it can contribute, and issues associated with communication and accountability are described below.

4-1.1 Enhance External/Internal Communication and Coordination

External: The District has a number of outreach and education activities directed at helping the public to understand water resource issues and how the District operates. Greater emphasis is needed on communicating with citizens, local governments, and members of the Legislature regarding the operation, management, and responsibilities of all the water management districts in the public interest. Greater coordination of these efforts, as well as a focus on water-related subjects, are necessary. It is also important for District staff to be aware of the interest and needs of the public, and to be aware of changes in federal and state water and related resource management agencies and policy. For example, recent budgetary and legislative changes have generated an increased need for better coordination with other districts and the Executive Office of the Governor (EOG). The District's challenge is how to better facilitate these relationships.

Internal: Improved communication among staff within the District is critical to organizational performance. The management and protection of water resources requires a multitude of tasks, programs and activities as described elsewhere in this Plan. The SWFWMD currently employs approximately 735 personnel. There are five offices, arrayed over a 16-county area, from which these activities are carried out. There are 17 departments, each subdivided into sections. There are many distinct programs, ranging from land acquisition and management to hydrogeologic investigations. There is a wide variety of technical expertise, including engineers, hydrologists, planners, geologists, economists, lawyers, etc. Given the voluminous and multi-faceted enterprise at the District, it is no surprise that issues of coordination and communication, at all levels and across all departments, arise. Particular concerns include: (1) dissemination of information about current rules, including distribution of revisions to

permit information manuals and rule chapters; (2) ensuring that appropriate staff are adequately trained with respect to statutory and procedural rule requirements; (3) increasing timeliness and consistency with the District's service offices through strengthened communication; (4) increased input to Senior and Executive staff from the bottom up; (5) greater sharing of information on current issues, Board and senior staff policy and direction, so all staff can be more responsive as issues arise; (6) inclusion of Management Services staff early in decision making processes; and (7) communication of District goals and vision throughout the organization.

4-1.2 Accountability: Are We Efficient and Effective?

Enhancing the means currently in place to measure departmental and District effectiveness can improve documenting to taxpayers and others that their dollars are being spent wisely. This issue revolves around the importance of monitoring and enhancing effectiveness measurements as it relates to outcomes (i.e., primarily resource-based improvements resulting from our management activities). Occasionally reality and the public's perception differ and it is incumbent on the District to effectively communicate our accountability.

4-1.3 Improve Comprehensive Planning

Critical to the success of the District's planning process is the need to link District planning efforts to each other, to District operations, and to budgeting activities. Integration of District plans with the budget process is particularly critical. This is occurring in part through the District's Program Budget Plan. In the future, all aspects of planning must become better united with District budgeting efforts. An additional need is to ensure that the prioritization of focus and projects that occurs during planning processes permeates the organization. This is being furthered through

the CWM efforts, with focus on coordinating several District planning activities.

There is a need to assure District stakeholders that the District is successful in following its plans and strategic priorities, annually evaluates implementation successes and impacts to assure progress, and makes any necessary changes to priorities.

4-1.4 Multi-Disciplinary Approach

A multi-disciplinary approach to water resource management requires increasing use of combined staff work efforts. These include enhanced inter-departmental communications, diverse staff work groups, participation by other agencies and citizens, standing committees and/or multi-departmental program/project efforts. The CWM effort is a good example of this type of work process. Management Services at the District can assist in achieving multi-departmental, multi-disciplinary integration.

4-1.5 Enhance Legislative Monitoring/Awareness

The state Legislature continues to express a strong interest in the activities of the Districts, ranging from programmatic issues such as minimum flows and levels, water supply planning and allocation, to efficiency and accountability issues. Accordingly, there is a need to closely follow legislative initiatives, to maintain vigilance in reviewing and responding to them, to provide support to legislative committees and staff as they investigate and deliberate water management issues, and to keep all staff informed of legislative actions.

4-1.6 Management Services Integration

There is a need to involve Management Services staff during all phases of water management practices at the SWFWMD, including provision of legal services, technological and physical

facilities, budget and planning, and communication to the public and decision-makers. Management Services functions of the District are a critical component to creating an organization that is a cohesive entity. The agency should more greatly reflect that it is the sum of its parts. The Management Services components can help technical staff make better decisions. Whether this is in training for better hiring decisions, or consultations on needed computing facilities, this function must become more proactive as opposed to being seen as reactive or useful only when asked.

4-2 Finances

The District has made substantial changes to its budget procedures to coordinate with legislative changes. An important change includes the EOG review and approval of the District budget, creating the opportunity for greater coordination within the agency and with other agencies. For example, the need to levy additional funds with other cooperators to implement the Southern Water Use Caution Area (SWUCA) strategies is discussed in Section III B. , the Water Supply Chapter.

The District's budgeting philosophy has undergone changes as well to match changes in the business world. An example is greater use of the "just-in-time" purchasing philosophy. Direct purchases through E-mail for items as needed has reduced the storage needs for a number of supplies. Sinking funds can be more often used to allocate funds for changes known to be imminent, but with unsure costs. Technology budgeting is a good example of the successful use of sinking funds. Fleet changes have resulted in cost savings. The District's fleet of vehicles has been reduced based on use and need. Fleet models are now standardized and much of the mechanical work can now be done at District garages. Additionally, the District has put greater emphasis on seeking and attracting expanded grant opportunities. For an increasing number of issues, anticipated needs

on the horizon may exceed our capacity to respond financially as a single government agency. The SWUCA water resource supply development needs is an example. The agency will seek grants to leverage available funds and expenses with private, large business, local, state and federal entities.

4-3 Staff

One of the most valuable assets of the District is its staff. The District has a continual effort underway to enhance employee friendly activities and policies, such as flexible hours, job sharing, and providing work space at service offices throughout the region.

Creating a safe work environment is also key to District operations. Efforts to provide ergonomic comfort are an example. Staff furniture needs and requests for workstation modifications are readily addressed under the philosophy that it is good business to take care of the people who do the business. The agency is continuously seeking to reduce risk to employees. An example is the establishment of times and mileage to retire fleet vehicles before they become a safety hazard. The District also has a commitment to security of personnel, facilities, equipment, its Web site, etc. Focus is on protection of the people who work for the agency and its public assets. Proposed changes to further safety include a new gate planned at the Brooksville office to limit after-hours access and a reconfiguration of all service offices to provide greater security.

The District goal is to stay within the mid-point or average of the labor market for a variety of parameters such as salaries and benefits. A maximum 6 percent turnover rate is the standard goal; however, due to a very good job market, geographic and other considerations, the turnover rate during 1999 was higher.

Issues associated with District staff resources are described below.

4-3.1 Service Delivery

The District has operated under a general “no increase in staff positions” budgetary policy for a number of years, with very few exceptions for specific priority needs. The number of full-time, Board authorized positions has increased by only 23.5 over the past five years. This has caused the agency to reallocate existing staff positions to competing priorities, to seek ways to improve efficiency of existing staff and to seek outside support services for various functions. The District emphasizes a continuous process of improvement through enhanced training, technology and re-engineering. Although continued improvement will be sought, there is concern that service delivery may be negatively affected as the demand for existing services continues to grow or as new services are placed upon the District (either legislatively, by delegation or by changing resource conditions; e.g., floods, droughts, population growth, etc.). Both programmatic (e.g., directly related to water supply, flood protection, water quality and/or natural systems management) and internal support services (e.g., financial, information resources, human resources, etc.) may be affected.

4-3.2 Refine Training Approach/Strategy

The development and availability of staff training remains an important issue for attracting, retaining and enhancing the work life of District staff. Training is desired within and among departments to enhance understanding and cooperation, and to aid career development. Training is currently provided to support a wide range of District interests, including scientific disciplines, supervisory skills, communication and conflict resolution strategies and the District’s increasing use of computing and other technologies.

Training initiatives are in continuous development through a process of periodic needs assessment to determine the types of training that best advance the needs of the District and

the knowledge and career opportunities for District employees. Each year's initiatives enhance and enable staff advancement through the provision of on-the-job training and specified classroom training. In addition, formal employee education is promoted and supported through the District's Tuition Assistance program. The costs of implementing these programs are recovered through increased employee satisfaction, improved productivity and reduced recruitment costs.

4-4 Technology

An important consideration of the District's goal to increase efficiencies is the use of technology. Increasing Internet opportunities exist for staff research, information retrieval for those outside the agency, and job and permit applicants. This is particularly timely in light of the recent legislation to provide on-line permitting to streamline the process. A workflow/imaging initiative is under way. Imaging refers to the conversion of documents into a digital image that can be electronically stored and retrieved. Technology transfer has become an international phenomenon with District technical assistance provided to groups from South Africa, Morocco and Egypt among others. The technical library is being updated to increase capacity and external access. A forms management effort will eliminate duplication and ensure consistency for statewide activities. Electronic applications enhance these efforts. The District's Intranet has become a valuable communication and information transfer tool. And, there is now on-line, real-time and adequate financial information for all staff to access and assist in better decision-making.

Issues associated with technology are described below.

4-4.1 Assure Adequate Tools – Hardware and Software

Aspects of this issue include specific hardware needs, more user-friendly menus and interfaces, enhanced technical and custom software (compilers, high quality graphics, etc.) and the training required to make full use of these. Rapidly changing technology significantly affects the Information Resources Department's (IRD) ability to provide quality service and continuous improvement. Both purchased and internally developed computer software provide increased functionality. However, this software is often more complex, makes increasing demands on the hardware platforms, and upgrades occur more frequently. The using community requires increased training to use it, the support technicians require more training to support it, and the hardware must be upgraded to fully support it. Accomplishing District goals, using resources efficiently, and staying technologically current usually cannot be done in a single budget year. Therefore, most projects are done in phases over multiple years. This approach allows the District to achieve the benefits of newer technology, allows the staff to adapt to change, and maintains budgetary discipline. However, due to budgetary constraints, the District cannot rapidly change technologies to meet rapidly changing water management requirements.

The Geographic Information System (GIS) is a significant tool for progress of the Comprehensive Watershed Management (CWM) and other major initiatives at the District. GIS enables the analysis and comparison of large amounts of spatial data that would otherwise be possible only with tremendous labor output. As more staff, including the 11 CWM teams, call upon this limited resource, the adequacy of GIS support will be an important issue for the future.

4-4.2 Improved Access

Improved Districtwide access to data requires a cooperative effort between users and the IRD. The issues include user interfaces (e.g., networking needs both within and between departments and with the State and other water management districts, streamlined on-line permitting process), data standardization and quality of internal and external databases (e.g., RDB, WMDB, STORET, USGS). Also included are training opportunities, the ability to access data from different databases on different systems and increasing use of the Internet for information sharing with other agencies and the public. Once the data is obtained, it must be displayed in both text and graphic forms at locations convenient to the user. The using community must be educated in how to use the automated systems, how to explain their requirements to technical personnel, and how to be partners during system development. Technical personnel must work with users to define requirements and help translate them into hardware, software, and communication solutions. As the missions and data requirements of the districts, DEP and other agencies converge, these issues will take on statewide importance.

4-4.3 Specific Data Collection Needs

In general, there is a call for improved quality of data (e.g., permit based data should be subject to quality assurance and quality control routines to ensure greater confidence and analytic capabilities), a recognized need for aerial mapping updates in high growth and flood-prone areas, and increased data on the environmental impacts due to withdrawals of water and increasing nitrates in groundwater.

There are a variety of ways to address this issue. The District is presently moving toward enabling permittees to provide permit condition data electronically, there is a need for an update of the District's data collection plan and greater use of

that plan by staff, establishment of data standards, coordination of the many individual databases at the District, transfer of island databases to mainframes, coordination of multi-agency data (e.g., water quality information), and more involvement by non-IRD staff in decision-making. Recent successes of the Database User Group (D-BUG) have included identification and correction of a number of issues associated with data education, quality, access and data standards.

4-5 Facilities

The District's Fiscal Year 2000 Five-Year Capital Improvement Plan provides a breakout of planned facility improvements by service office for the years 2000-2004. The major projects are:

- ❖ A two-phase project for the Tampa Service Office will provide a new board room by the end of FY 2000 and an office complex to replace the current building will be completed in FY 2003.
- ❖ The Venice Service Office will move to a five-acre parcel purchased from Sarasota County in FY 2001. This will enable a shared facility with the county.
- ❖ The Brooksville Service Office will undergo renovation of its Building 1. Building 7, the most recently constructed building, will be home to the Resource Regulation Department Technical Section and the Resource Data Department Lab. There will also be a variety of small facility changes at this service office. Future challenges include evaluating some of the older buildings to ensure their continued viability. Active involvement with IRD and Communications is anticipated to ensure that staff is aware of construction facilities.

Section 5. Management Services Guidelines

The following statements provide long-range guidance to the District in fulfilling its Management Services responsibilities. They are statements that express the position or strategy of the District that will be applied consistently in response to specific issues. In this case, "District" refers to the Governing Board and Basin Boards, since both make funding and other decisions. As with the entire District Water Management Plan, these guidelines will be reviewed at least every five years.

These guidelines will be implemented only to the extent that financial, staff or other necessary resources are available, pursuant to the budgetary actions of the Governing Board and Basin Boards. They do not create any regulatory authority and may require rule making as one component of their implementation. The guidelines contained within the Plan shall be reasonably applied where they are environmentally, technically and economically feasible.

1. Promote a private-sector style work environment and organizational culture dedicated to operating "better, faster and cheaper."
2. The District is committed to maintain and enhance policies and practices that attract, hire, retain and promote staff without regard to race, ethnicity, gender and other differences.
3. District activities must be fully coordinated with appropriate statutory, internal and external stakeholders before final approval and commencement of timely implementation.
4. District activities must be conducted in an empowering staff environment dedicated to seeking continuous process improvement.
5. Coordinated procedures and time lines will be developed for District annual planning and reporting activities. These include

development of strategic initiatives, District Water Management Plan evaluations and amendments, Comprehensive Watershed Management, preparation of individual department plans (e.g., IRD, Capital Improvement Plan, etc.), and Program Budget preparation with performance measures.

6. The District supports the reduction, reuse and recycling of solid waste and alternative, environmentally sound, disposal methods, both within District operations and in coordination with other agencies.
7. Integrate communication initiatives into all appropriate District activities.
8. Provide opportunities to individuals or groups, both internal and external to the organization, impacted by District decisions to effectively participate in the decision-making process.
9. Increase coordination with other agencies and organizations to reduce duplication of effort and increase consistency of messages to promote sound water resource management, including conservation and related activities.
10. The District will invest in adequate personal productivity, training and communication technology including, but not limited to: networking; Inter- and Intranet Web site development; data management, accessibility and security (regulatory and hydrologic data); and image technology.
11. The District will maintain and develop adequate staff facilities necessary to ensure safe and productive work sites, facilities and public access through convenient service offices.

Section 6. Implementation Strategies

Implementation strategies are the means through which the District responds to identified issues to improve effectiveness and efficiency. They are the synthesis of our planning efforts. Within this section,

implementation strategies are described for the District's major Management Services initiatives, including those for the issues previously identified. The following strategies will be integrated with, and implemented through, the budgeting and planning activities of all appropriate departments.

6-1 Communication and Accountability

Task 1: The efficacy and feasibility of developing an internal communication program will be evaluated by 2001. This program will highlight major District activities in all departments, encourage Department Directors to share information, such as Senior Staff minutes, answer staff questions on a continuous basis, provide information on the District's 'management culture' and address other issues relating to internal communications. Possible techniques may include a personal/professional brown bag lunch program and more widespread use of department monthly activity reports. Procedures will also be developed to ensure that priority projects targeted in planning activities and documents are communicated throughout the organization as the District's approved prioritization for resource allocation for that period.

Responsible Entity: District Executive and Communications and Community Affairs departments.

Task 2: Develop an education program by 2001 for all District employees to become familiar with the District's vision and mission, how to define the District's purpose, and how the District achieves its mission, including how to articulate this when in public settings.

Responsible Entity: District Planning, Communications and Community Affairs, Executive and Human Resources departments.

Task 3: Develop a process to improve communication between the legislative liaison

and staff, as well as among staff reviewing bills during each session. Evaluate the efficacy of establishing, and if deemed appropriate, set up an electronic bulletin board for staff involved in the legislative session and bill review process each year. These processes will begin during the 2001 legislative session.

Responsible Entity: District Executive, Communications and Community Affairs and Information Resources departments.

Task 4: Periodic middle management meetings, similar to existing Senior Staff meetings, will be considered as a means to improve communication and coordination among departments at the mid-staff level (by 2001).

Responsible Entity: District Executive Office.

Task 5: Pursue ways to strengthen links between District plans and the budget. This may include changes in District budgetary forms and reporting requests for FY 2002.

Responsible Entity: District Executive, Planning and Finance departments.

Task 6: The budget development process will be evaluated and revised as necessary by FY 2002 to improve the assessment of new projects on support services and other departments.

Responsible Entity: District Finance, Executive, and General Services departments and all Department Directors.

Task 7: The Effectiveness Measures (EM) initiative will produce an annual report, in conjunction with the District Water Management Plan annual progress report. The EM Annual Report will address DAIs and will be intended to improve public accountability of the District.

Responsible Entity: District Planning and Finance departments.

Task 8: Develop an enhanced training program for new Board members to include: specific information and discussion regarding the District's rules; Board functions and roles; ongoing programs and projects; and the agency's history (by 2002).

Responsible Entity: District Executive, Planning, Resource Regulation and Communications and Community Affairs departments.

Task 9: Develop a comprehensive new-supervisor training program by 2003 to ensure familiarity with the Personnel Guidelines and Procedures, other Human Resources programs and supervisory skills.

Responsible Entity: District Human Resource Department.

Task 10: Expand the pool of in-house speakers for the District's Speakers' Bureau and develop slide shows and other presentations on selected issues important to the District. Develop a series of key issue oriented messages to be delivered to all groups (ongoing).

Responsible Entity: District Communications and Community Affairs Department.

Task 11: An evaluation process will be implemented by 2001 to decide presentation priorities for the Speakers' Bureau based on group size, area and interest, to respond to increasing requests for speakers.

Responsible Entity: District Communications and Community Affairs Department.

6-2 Finances

Task 1: Priorities identified in District plans will be used to develop annual budget, staff and facility needs (ongoing).

Responsible Entity: District Finance, Executive and appropriate departments.

Task 2: Budget methods will be evaluated by 2003 (such as additional sinking funds for technology) that enable and ease management of multi-year project fund expenditures. The intent will be to further management flexibility, while retaining high efficiencies.

Responsible Entity: District Finance and Executive departments.

Task 3: Develop and disseminate comprehensive financial guidelines to provide guidance to District staff for accurate reporting of all financial requirements (by 2004).

Responsible Entity: District Finance Department.

Task 4: The performance indicators developed in the Effectiveness Measures project (Budget Performance Measures) will be used with each year's budget requests, including reports to the Governors Office and Legislature, to justify the need for more or less personnel, goods or services, and to be able to effectively communicate those needs to the Boards and the public (initiated for FY 2002 budget process).

Responsible Entity: District Executive, Finance and Planning departments.

6-3 Staff

Task 1: Initiate a six month review/refresh orientation for new employees with emphasis on the opportunity to ask questions one-on-one. Provide the Guide to the District to new employees (ongoing).

Responsible Entity: District Human Resources Department.

Task 2: Identify training needs through directors and managers (ongoing).

Responsible Entity: District Human Resources and Information Resources departments.

Task 3: A process will be developed by 2002 to research and provide information on opportunities in basic science training to all non-technical District staff. This information will be provided to all new employees with encouragement to learn about water resources in the District.

Responsible Entity: District Human Resources Department.

6-4 Technology

Task 1: Improve collaboration, calendaring and overall E-mail integration through the use of Groupware by 2002.

Responsible Entity: District Information Resources Department.

Task 2: Link the District's Web site to internal data such as water resource information and GIS maps by 2005.

Responsible Entity: District Information Resources and Resource Data departments.

Task 3: Upgrade the District's GIS with larger servers that will increase data availability to the service offices and allow for more efficient bandwidth by 2001.

Responsible Entity: District Resource Data and Information Resources departments.

Task 4: Complete Imaging and Workflow projects to enhance printing and plotting services by 2003.

Responsible Entity: District Information Resources and Records and Data departments.

Task 5: Hold meetings on a regular basis to coordinate quality assurance and control of collected and reported data, and to maximize accessibility to these data (ongoing).

Responsible Entity: District Resource Data and Resource Regulation departments.

Task 6: Continue evolution of the District's information infrastructure to achieve rapid access to District data, high system availability, increased decision support capability, and rapid development of software to meet District needs (ongoing).

Responsible Entity: District Information Resources Department, in coordination with other departments.

Task 7: Survey data users periodically to monitor perception of quality assurance and control of collected and reported data, and accessibility to these data (initiate in 2001).

Responsible Entity: District Resource Data and Resource Regulation departments.

Task 8: Maintain the existing Database Users Group (D-Bug) on an ongoing basis, with emphasis on the work of the Education Subcommittee.

Responsible Entity: District Resource Data, Regulation and Information Resources departments.

Chapter IV. The Integrated Plan

All five water management districts have collectively recognized that operating as regional resource agencies can make it difficult for individual local governments to identify with District efforts. In the SWFWMD alone, the 16 counties served (not to mention the other 82 local governments they contain) all have their own plans, programs and concerns when it comes to water resources. This is why the districts have agreed to generate an "Integrated Plan" for each county in our respective jurisdictions.

The ultimate purpose of Integrated Plans is to summarize the results of the District Water Management Plan on a county-by-county basis in order to create a water management plan for each county in the District. This effort is designed to facilitate and enhance coordination with local governments, address their particular water management needs and develop mutual implementation strategies to resolve identified issues. Integrated plans are organized according to the District's four resource-based areas of responsibility: water supply, flood protection, water quality management and natural systems management. The end result will be "stand alone" documents, in effect a technical information resource that can be used to enhance local government comprehensive plans by linking local water resource planning to the best available data and other resources of the District. These individual integrated plans are made a part of this Plan by reference.

The development of integrated plans will be a cooperative effort of not only the five districts, but the affected local governments and other parties (e.g., regional planning councils and water supply authorities). In this way, the very interaction the plans are intended to promote will have already been initiated. This coordination begins with reviews of the adopted local comprehensive plans and other resources, includes meetings with local staff to identify

issues and existing programs, as well as local review and comment opportunities on the draft plans. Integrated plans will be developed following completion of the overall Plan update, but by no later than November 1, 2000.

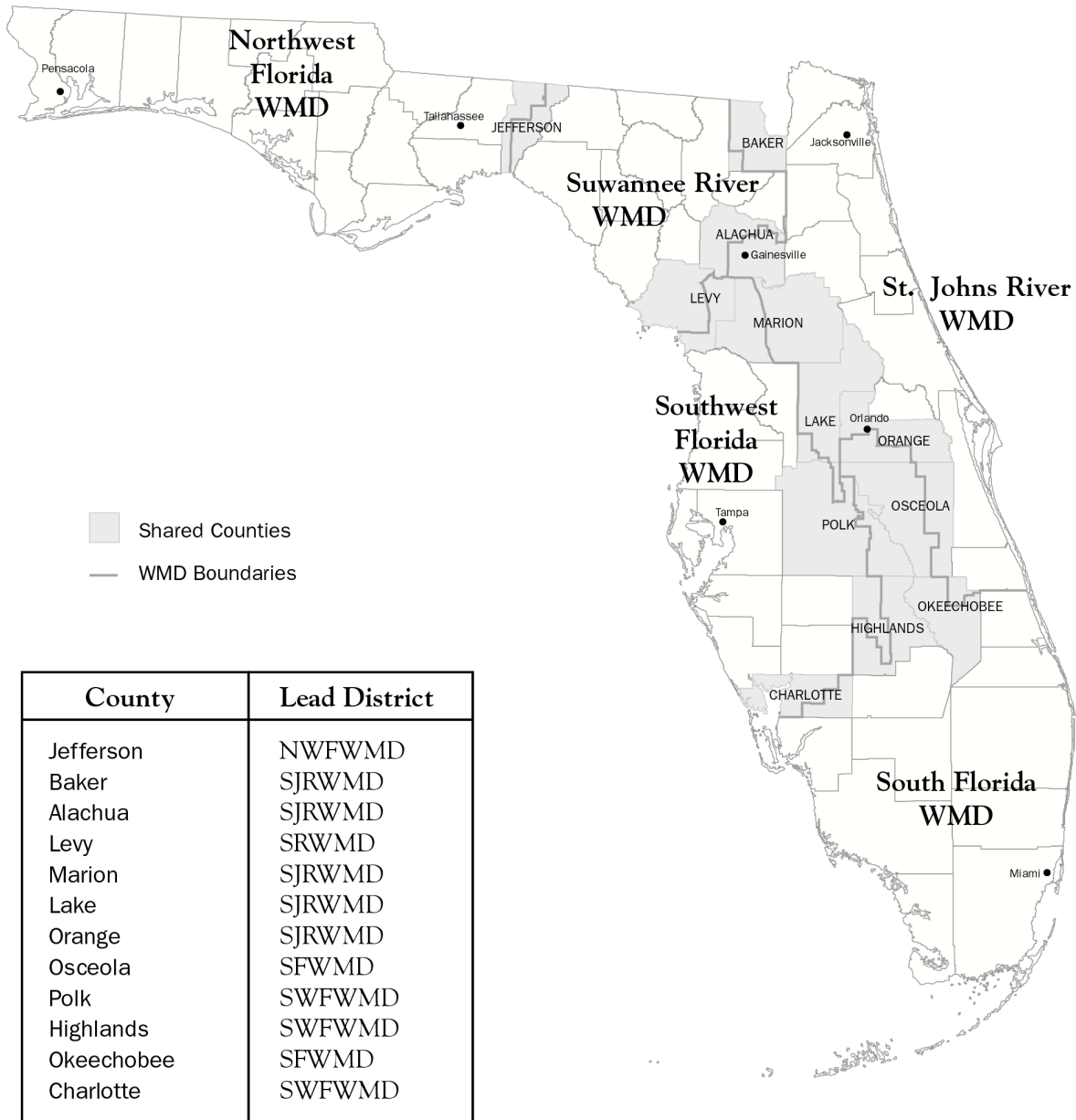
This effort is best viewed as a process, however, since it is intended to promote continuing relations and mutual planning in the best interest of the resource. All integrated plans will be periodically updated. It is hoped the action strategies identified will end up back in the local government plans where local and District energies and funding can be directed toward them.

For counties split by water management district boundaries (see Figure 29), a "lead" district has been assigned by mutual agreement among the districts to develop each county's integrated plan. The lead districts for counties only partially within the SWFWMD are as follows:

Charlotte - SWFWMD
Highlands - SWFWMD
Polk - SWFWMD
Lake - SJRWMD
Marion - SJRWMD
Levy - SRWMD

Figure 29.

Shared Counties—Integrated Plans Florida Water Management Districts



Source: SWFWMD, Planning Department
December 1999

Chapter V. Watershed Management

Section 1. Introduction

Purpose and Goals

The Comprehensive Watershed Management (CWM) Initiative has been established in an effort to improve the management of water and related natural resources within the Southwest Florida Water Management District (SWFWMD or District). Started in 1994, the CWM Initiative employs a watershed-based approach to water and related natural resource management. Staff from a variety of disciplines and departments make up "watershed teams" that have been assigned to eleven primary watersheds within SWFWMD (see Figure 30). Local governments and other stakeholders within each watershed are also significant partners on a number of these teams. The goals for the teams include:

1. Collect, integrate and analyze the existing wealth of information pertinent to each watershed and create a data base for analytical purposes;
2. Identify and prioritize existing and future water resource management issues relating to water supply, flood protection, water quality and natural systems (District Areas of Responsibility);
3. Develop preventative or remedial actions to address these resource management issues;
4. Implement and monitor the effectiveness of selected actions and the overall process and recommend potential revisions.

The CWM Initiative helps to ensure that comprehensive, coordinated analysis and decision-making take place. It fosters closer cooperation among the District, local governments and other stakeholders to help preserve the qualities of watersheds as growth and development take place in the future.

Coordination With Local Governments and Other Agencies

A significant element of the CWM Initiative is the active involvement of the local government(s) within a watershed. Local governments have the greatest influence over future growth through their comprehensive plans and associated land development regulations. Partnering with local governments is essential to the success of the CWM Initiative. Each CWM team either currently has, or is scheduled to include, active participation by the local government(s) within its watershed. This will include participation in issue identification, development of preventative or remedial strategies and coordinated implementation where local programs are involved. Other agencies which are, or will be, requested to participate include the Department of Environmental Protection, Department of Agriculture and Consumer Services, the Florida Fish and Wildlife Conservation Commission, regional planning councils, National Estuary programs where appropriate, citizen groups and others. The objective is to have a truly collaborative approach to CWM planning and implementation.

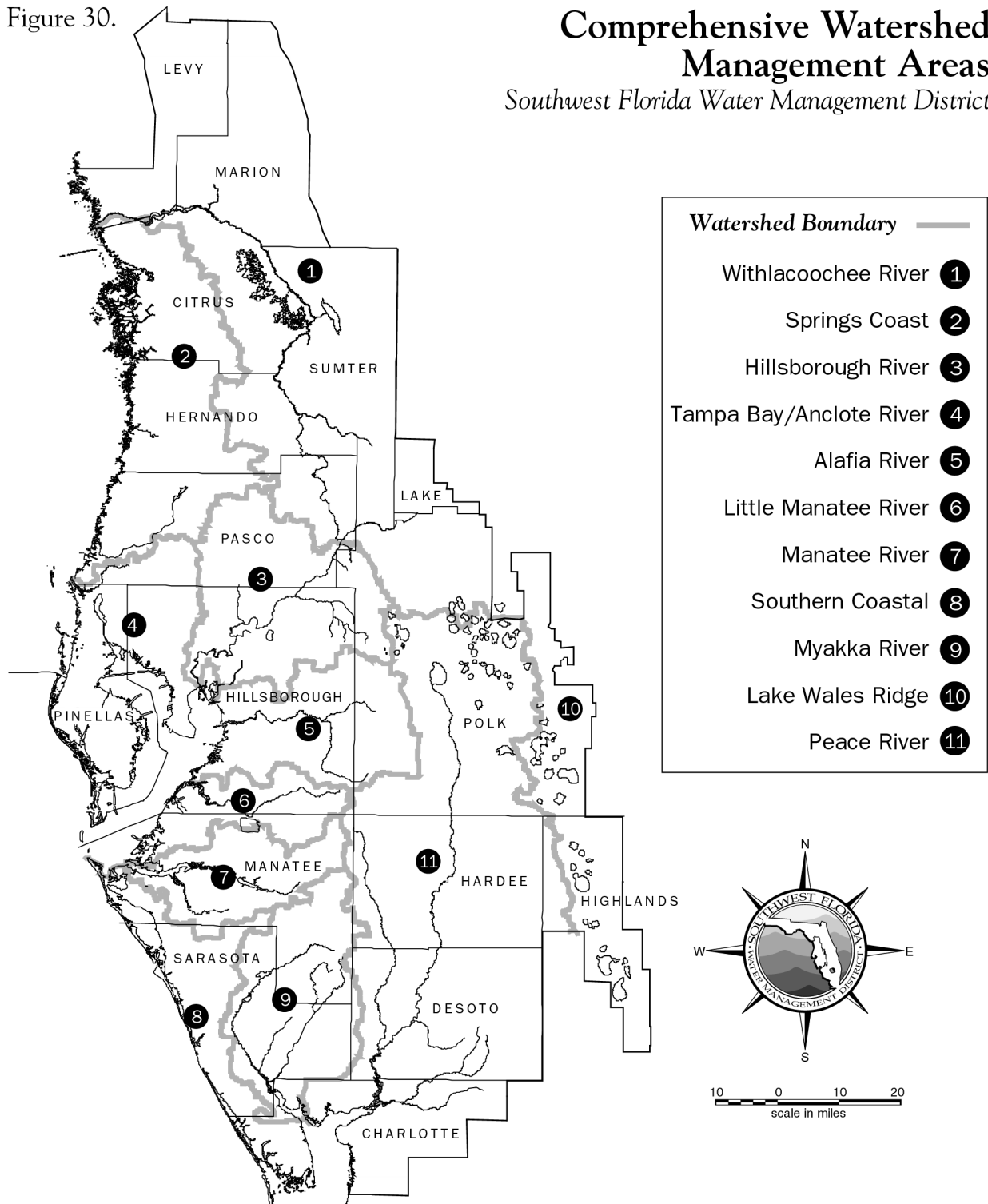
The CWM Process

Each CWM team has been charged with developing a watershed management plan. Currently in various stages of development, the watershed plans are complex in the breadth and variety of issues that they encompass, but simple in intent and design. They analyze the wealth of information available in each area, identify issues and recommend specific actions to address them. The fundamental elements of the plans are the four chapters that identify issues in each of the District's four AORs. Specific and realistic actions to address each issue are presented in each chapter. All CWM plans, as completed, become a part of the District Water Management Plan through incorporation by

Figure 30.

Comprehensive Watershed Management Areas

Southwest Florida Water Management District



Source: USGS and SWFWMD
February 2000

reference. When completed, these initial plans will represent a “snapshot-in-time,” reflecting best available information, existing and future resource management issues and recommended strategies. The plans will be updated periodically to reflect improving knowledge, the implementation of selected strategies and changing resource conditions.

Implementation

Each watershed management team has suggested, or will suggest, specific and realistic actions and tasks. Recommendations the District is responsible for implementing of will be prioritized by a District senior management team (Steering Committee). The Steering Committee is responsible for determining priorities, directing them to the appropriate staff or board(s), allocating staff time and evaluating and prioritizing resources to them. Many of the priority actions already identified by CWM teams are in the process of implementation. These include: increasing the water quality data collection in the northern part of the District; GIS analyses of historic soils, habitats and natural systems; coordination with regulatory authorities on project reviews and interpretation; and a variety of specific projects in various watersheds which benefit all four areas of responsibility. In many cases, the Cooperative Funding Program of the Basin boards has been used as a catalyst to accomplish key actions while involving local governments and other cooperators.

It is hoped that recommendations which fall within the responsibility of local governments or others to implement will be similarly prioritized and implemented. A Memorandum of Understanding between the District and each county government, and potentially other participating parties, may be proposed as a vehicle to ensure coordinated implementation of these collaborative planning efforts.

Watershed management teams will annually review the implementation of recommended actions. These teams will report on implementation status for the Annual Report on the District Water Management Plan and provide a brief summary for each watershed. This information will also be used within the Basin Board Five-Year Plans and in District accountability and performance reporting.

The Future of CWM - A Watershed-based Partnership Approach

One of the most significant tools available to watershed teams is the District’s Geographic Information System (GIS). A GIS is a database that is designed to efficiently store, retrieve, analyze and display mapped data. The ability to reference data by their location on the earth’s surface provides an effective means of integrating data from many diverse sources. The GIS currently allows staff to integrate data from ground and surface water models, the District’s Regulatory, and Water Management databases, and results from statistical analyses done using the Statistical Analysis Software (SAS). This capability to integrate data from multiple sources allows staff to analyze databases to find relationships between the data that have not previously been discovered, a process known as data mining. Examples might include relationships between different types of land use and soils data. Alone, the GIS is only a database with associated spatial modeling tools; combine a GIS with other models and remotely sensed data, and it becomes a robust platform capable of depicting the long term impacts of current decisions in a format easily understood by decision makers.

The GIS allows a variety of information pertinent to each watershed to be analyzed both spatially and over time. Information specific to each watershed available to the teams includes FEMA delineation of flood prone areas (the 100-year flood plain), existing land use and land cover, wetlands and regionally significant

natural systems, future land use as designated in local government comprehensive plans, and existing data collection sites, among other information. The GIS allows the staff teams to analyze the best available information in such a way as to not only understand current conditions, but to also anticipate future conditions through scenario modeling.

The GIS can be a tremendous tool to help identify and prioritize existing resource management issues within a watershed, as well as anticipate future changes which may occur. For instance, existing land use and land cover information can be overlaid with the 100-year flood plain and other known flood-prone areas to depict existing development within flood-prone areas. This information can be used to target and prioritize flood mitigation activities. The GIS can also help to anticipate, and potentially avoid, future flooding problems through scenario modeling. By comparing current and future urban development, derived from local government future land use maps, with known flood-prone areas, an estimate of planned future growth within the 100-year flood plain can be developed. GIS can be used to depict likely development scenarios so local decision makers can evaluate potential problems and take appropriate preventive measures such as modifying growth patterns or placing other controls on development in the flood plain. The power of GIS as a modeling tool lies within its ability to be used to integrate the results of other numerical, statistical, engineering, and spatial models and then dynamically depict and visually present scenarios from those inputs.

Utilizing the GIS as a tool in the Comprehensive Watershed Management Initiative represents an evolution in direction for the District, providing the opportunity to enhance coordinated action between the District, local governments and others. The current policies and “body of decisions” of local governments, the District and other agencies (Department of Environmental Protection, Department of Agriculture and

Consumer Services, the Florida Fish and Wildlife Conservation Commission, National Estuary Programs, etc.), can be compared to existing and anticipated conditions in a given watershed, and decisions made about the desirability of the predicted future which will result from those decisions. This “body of decisions” can include existing regulatory programs, land use plans, land acquisition plans, and other management tools used by various levels of government. If the anticipated result, based on projecting today’s body of decisions into the future, is not desirable (i.e., worsened flooding problems, degraded water quality, loss of natural systems), then the current body of decisions can be revised in order to implement a preferred vision for a watershed. A depiction of this “reality-based planning” is shown in Figure 31. This is the future direction for the CWM Initiative.

Section 2. CWM Plan Summaries

As previously noted, each CWM team is working on individual watershed plans and, consequently are at different stages in the process. The watershed descriptions and issue assessments for each of the 11 watersheds that follow reflect these differences in analysis and issue and strategy development. It is anticipated that initial plans will be completed for all watersheds by December 2000 and become part of this Plan by reference once accepted by the Governing Board.

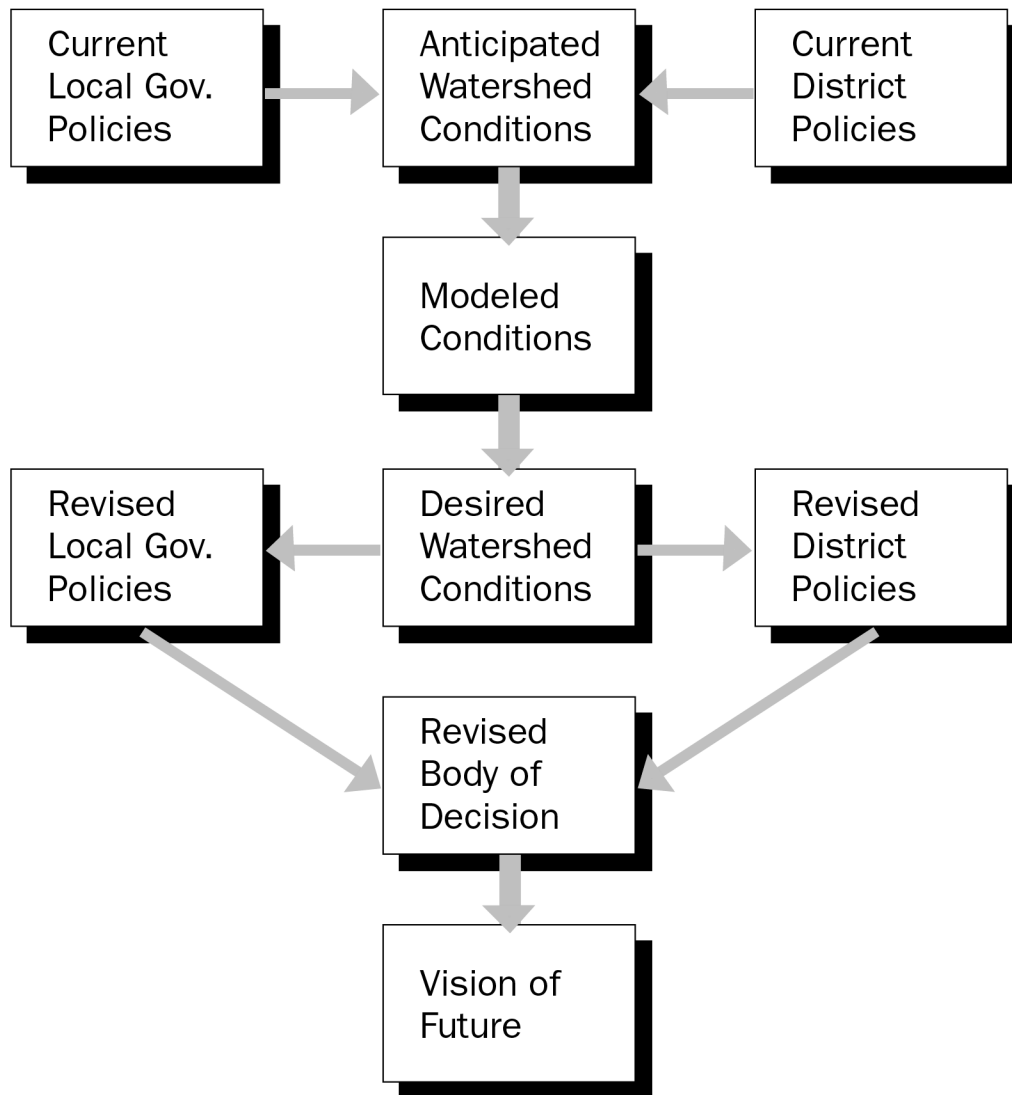
Withlacoochee River Watershed

The Withlacoochee River watershed, located in the central/northwest part of the District, covers approximately 2,100 square miles. The 157-mile long Withlacoochee River originates in the Green Swamp and extends northward, discharging to the Gulf of Mexico near Yankeetown, Florida. In 1989, the river was designated an Outstanding Florida Water (OFW) by the Florida Department of Environmental Regulation (DEP).

Figure 31.

Comprehensive Watershed Management

Changing Direction



Source: SWFWMD,
December 1999

The dominant land uses and coverages in the Withlacoochee watershed are wetlands, upland forest, rangeland, agriculture, mining and urban (built-up). The Green Swamp has mostly agricultural and wetland coverages. Further downstream, land uses become more urbanized near Dade City in Pasco County, but agriculture and wetlands are still dominant. Finally, in the Lake Tsala Apopka area downstream to Dunnellon, more land is urbanized, but agriculture and wetlands are still a dominant part of the landscape. Public land ownership is significant within this watershed. Through various state programs, many large parcels of land are in public ownership.

Since its inception, the Withlacoochee River team has had considerable interaction with other agencies and citizens. A few examples are listed below:

- ❖ Development of a report to address flooding issues in Sumter County.
- ❖ Organization of a Multi-Agency Tsala Apopka Fair with participation from Citrus County, Corps of Engineers (COE), DEP, and U.S. Fish and Wildlife.
- ❖ Involvement with DEP's Withlacoochee Ecosystems Management Area (EMA) Initiative.
- ❖ Supported the Governor's Environmental Advisor during a reconnaissance of the river.
- ❖ Met with representatives from the Suwannee River Water Management District (SRWMD) to learn about that District's integrated model for the Waccasassa Watershed.
- ❖ Supported Citrus County on several water quality initiatives.
- ❖ Accompanied DEP and Fish and Wildlife Commission staff to Potts Preserve to gather information on recreational use and access issues.
- ❖ Involvement in several educational projects.
- ❖ Participation in the Nitrate Remediation Workgroup and the Water Quality Monitoring Network Workgroup.

Priority issues have been developed for each area of responsibility as follows:

Water Supply. (1) Prevent Damage to the water supply resources of the area, (2) development of the Northern District Monitoring Network, (3) conduct a Northern District Water Resource Assessment Project, and (4) evaluate the Upper Floridan (potable water production zone) thickness.

Flood Protection. (1) Link land use with watershed management, (2) watershed flood management programs, and (3) maintenance and operation of flood management systems.

Water Quality. (1) Land use impacts in Karst geology, (2) increasing nitrate loading from groundwater, (3) septage and sludge disposal in the Green Swamp, (4) agricultural runoff, and (5) water quality monitoring program.

Natural Systems. (1) Habitat loss, alteration and Fragmentation, (2) evaluation of modification of water control structures associated with the Lake Rousseau/Lower Withlacoochee River/Cross Florida Barge Canal System, and (3) invasive exotic and aquatic plant management.

Springs Coast Watershed

The Springs Coast watershed encompasses parts of Pasco, Hernando and Citrus counties and includes a diverse variety of hydrologic and ecologic features. The eastern and central portions of the watershed are dominated by the Brooksville Ridge, a sandy remnant of previous higher sea levels, characterized by its karst geology with scattered sinkhole lakes and depressional wetlands. Many of these lakes and wetlands are connected to the Floridan aquifer

and exhibit changes in elevation related to changes in groundwater elevation. Ground water is the primary source of potable water for residents in the watershed. Continued population growth in the watershed will continue to create issues between land use and water resource planning. The Crystal, Homosassa, Chassahowitzka, Weekiwachee and Pithlachascotee rivers, and associated coastal aquatic resources, are dominant features of the watershed and provide high-quality recreational opportunities for area residents and tourists. Several areas within the watershed are rapidly developing, particularly the New Port Richey, Spring Hill and Crystal River/Homosassa Springs areas. Significant limerock mining operations are located northwest of Brooksville. Agricultural areas of the watershed, previously developed for cattle grazing and citrus, are slowly converting to low density residential and other uses. Of paramount concern is the need to maintain the quality and biological health of the waters and aquatic resources within the watershed to ensure their continued use and enjoyment for current and future residents.

As urbanization of the watershed is a relatively recent occurrence, a number of resource assessments and planning initiatives needed to effectively manage the resources of the watershed have yet to be undertaken. Given these considerations and the review of currently available information, the following issues and actions, by District area of responsibility, were identified by the Springs Coast watershed team as top priorities for the next one to five years:

Water Supply. (1) Assess water supply availability and seek establishment of minimum flows and levels – efforts currently under way to establish additional groundwater monitoring sites in the northern portion of the District in anticipation of a Water Resource Assessment Project, (2) prevent groundwater contamination through appropriate land use siting and development practices – Hernando County has developed and implemented a wellhead

protection program. Development of similar programs in Pasco and Citrus counties will be pursued, (3) address concerns about potential water supply development and export – continue to review water resource development within the context of “local sources first,” and (4) conservation of existing groundwater resources.

Flood Protection. (1) Pursue local government partnerships in the District’s Flood Protection Coordination Initiative (FPCI) – implement FPCI upon adoption by Hernando County and continue to partner on identified projects and initiatives. Identify potential flood protection coordination opportunities with Pasco and Citrus counties and develop draft coordination materials for their review and consideration, (2) implement local building codes and ordinances to address potential coastal flooding damages, (3) develop regulations for discharge of storm water into sinkholes in karst sensitive areas, and (4) establish education and awareness programs for the operation and maintenance of stormwater management systems.

Water Quality. (1) Reduce nitrate concentrations in spring discharge – interagency work group has formed to address increasing trends in groundwater and spring nitrate levels; Nitrate Symposium held in May 1999 provided opportunity for dialogue and public discussion of the issues related to nitrate trends; work group will continue to pursue opportunities to mitigate/reverse trends through various efforts, (2) develop a water quality monitoring network to address data gaps and monitoring needs – District staff has identified what data is currently being collected and what additional data/distribution needs remain, (3) investigate high bacteria levels in the Chassahowitzka River – study currently under way in conjunction with Citrus County to assess levels, potential contribution sources and corrective measures, and (4) develop and implement restoration plans for surface water bodies with poor water quality and preservation plans for the protection of water bodies with good water quality. Continue

implementation of the Crystal River/Kings Bay Surface Water Improvement and Management Plan.

Natural Systems. (1) Address elevated levels of nitrate in spring discharge, (2) limit the destruction and fragmentation of natural systems – complete a natural area core and corridor mapping analysis that will identify and inventory historical habitat distribution to determine habitat loss, evaluate/determine areas of high habitat value and viable linkages, and coordinate land acquisition and other conservation efforts among all programs in the watershed, (3) continue efforts to control/eradicate invasive exotic plants, and (4) address declining ground water and lake levels.

Hillsborough River Watershed

The Hillsborough River watershed encompasses parts of Hillsborough, Pasco and Polk counties and a diversity of surface water features and connections to the Floridan aquifer system. This watershed is highly developed, particularly in and near the cities of Tampa, Temple Terrace, Plant City and Lakeland. The Hillsborough River Reservoir is the primary source of potable water for the residents of Tampa and many adjacent areas. There are large agricultural areas in the watershed as well. Strong population growth in this watershed will continue to create numerous issues between land and water resource use and planning. The Hillsborough River, as well as the lakes and other aquatic resources in this watershed, provide high-quality recreational opportunities for area residents and tourists. Maintaining good water quality and conditions that also promote the biological health of these aquatic resources will ensure the maximum benefit for the resource now and in the future.

Fortunately, many resource assessments and planning efforts have been completed in the Hillsborough River watershed, and much information already exists to aid in the

evaluation of issues associated with the above-mentioned AORs. After reviewing available information gathered from completed and ongoing plans and activities, several issues have emerged as priorities. Many ongoing projects, including the establishment of minimum flows and levels are considered existing priorities and not included in the following list. The following issues and actions were identified by the Hillsborough River watershed team as top priorities for the next one to five years.

Water Supply. (1) Investigate expansion of the Northern Tampa Bay Water Use Caution Area (WUCA), (2) identify sites for wetland and aquifer rehydration – this may be a part of the Natural Systems mapping effort, (3) develop a baseline assessment of Blackwater Creek watershed hydrology, (4) advance Blue Sink/Curiosity Creek subbasin activities, and (5) expand the water resource monitoring network in the upper Hillsborough watershed.

Flood Protection. (1) Place existing information into a useable format – this includes a Memorandum of Understanding with Hillsborough County, (2) enhance enforcement of existing regulations – this includes the determination of operation and maintenance roles and responsibilities for systems throughout the watershed, and (3) advance Blue Sink/Curiosity Creek subbasin activities.

Water Quality. (1) Advance Blue Sink/Curiosity Creek/Sulphur Springs activities, (2) evaluate stormwater retrofit opportunity provided by the proposed Temple Terrace Civic Center, (3) evaluate Department of Transportation - 56th Street stormwater retrofit opportunity/feasibility, (4) develop an upper Hillsborough diagnostic septic tank study, and (5) address the Hillsborough River Reservoir Total Maximum Daily Load development, implementation and retrofits.

Natural Systems. (1) Complete a natural area core and corridor mapping analysis which will: identify and inventory historical habitat distribution to determine relative habitat losses over time; evaluate/ determine areas of high habitat value and viable linkages; and coordinate land acquisition and other conservation efforts among all programs in the watershed, and (2) complete a Crystal Springs nitrate study.

The DEP's Hillsborough River Ecosystem Management Area initiative has established a multi-agency group consisting of:

Department of Environmental Protection
Southwest Florida Water Management District
Tampa Bay Regional Planning Council
Hillsborough River Greenways Task Force
Hillsborough River Interlocal Planning Board
City of Tampa
Hillsborough County
Tampa Bay Water
City of Temple Terrace
Tampa Bay Estuary Program

This group is charged with coordinating the effective implementation of the Hillsborough River Comprehensive Watershed Management (HillCWM) Plan and to ensure there is no duplication of effort within the watershed. The Hillsborough River Greenways Task Force (HRGTF) serves as the public outreach entity in development of the plan. Hillsborough County is developing several watershed management plans. The CWM plans are being used as technical support documents for this effort. Additional input will be sought during the Hillsborough County Watershed planning process.

Tampa Bay/Anclote River Watershed

The Tampa Bay/Anclote River (TB/A) Watershed is a rapidly developing urban area that includes Pinellas County, southwest Pasco County, northwest Hillsborough County, and

the MacDill peninsula. Basins within the TB/A watershed drain directly to Tampa Bay or the Gulf of Mexico and are not captured by major rivers. The TB/A watershed is notable for its political diversity, extending over 28 local government jurisdictions. Major cities within the watershed include Tampa, St. Petersburg and Clearwater.

Tampa Bay (Bay) is the second largest estuary on the Gulf coast. Development of the watershed has had consequences for all of the District's AORs – flood protection, water quality, natural systems and water supply. Within the urban centers of the watershed, many natural areas have been lost to development and small remnants remain in the form of municipal parks and recreation areas. Water quality in the Bay reached a low point in the 1970s, and improved thereafter because of improvements made in waste treatment facilities and industrial point source discharges. In the early 1990s, the Bay was included in the National Estuary Program, known as the Tampa Bay NEP (TBNEP). Local governments worked through the TBNEP and produced a management plan to improve water quality and natural systems in the Bay. Tampa Bay is also a Surface Water Improvement and Management Program (SWIM) water body and numerous projects have been initiated to improve water quality in and around the Bay, and to restore wetland habitats to the Tampa Bay estuary.

The TB/A CWM Team, working with local governments, provided the technical background and impetus for two projects proposed as part of the Northwest Hillsborough Basin Board's FY 2000 cooperative funding program: (1) The Rocky Creek Water Quality and Habitat Improvement Project; and (2), the Double Branch Watershed Implementation Project.

In the process of creating the draft Tampa Bay/Anclote River Comprehensive Watershed Management Plan, the TB/A CWM Team drew upon the many plans and scientific studies completed by local governments, the Tampa Bay NEP, the SWIM program, and other planning entities in the Tampa Bay region. Of particular importance is the Tampa Bay Comprehensive Conservation and Management Plan (CCMP) that resulted in an innovative agreement among all key parties to support the management of Tampa Bay and to reduce nitrogen loading to the Bay. The final CWM document and action plan will encompass the needs and visions of all interested parties and provide a guiding action plan for the basins of the TB/A watershed.

The major issues in the TB/A watershed are concerned with urban growth and the changes attendant with that growth, as briefly listed in the following major issues and priorities identified by the TB/A CWM work group.

Water Supply. (1) Work cooperatively with local governments to restore water levels in lakes and wetlands that have declined due to aquifer withdrawals, drainage and development patterns, and (2) enhance water conservation and develop new water supplies to meet the growing water demands of the Tampa Bay region.

Flood Protection. (1) Enhance flood protection data collection and management efforts, (2) forge agreements between agencies concerning the ownership, responsibility, maintenance and operation of flood management systems, (3) expand studies to determine water surface elevations, conveyance, and flood potential for drainage basins in the watershed, (4) improve the regulation and management of total runoff volume from flood management systems, (5) seek consistent sources of funding for flood management systems, and (6) educate the public on the importance of floodplains for flood protection, and on the probability of flood events in low-lying areas.

Water Quality. (1) Implement remedial and preventive actions to address the degradation of water quality in streams, canals and lakes of the Tampa Bay and Anclote River watersheds due to high nutrient loads from point and non-point sources, (2) implement remedial and preventive actions to address the presence of toxic substances, including heavy metals, pesticides and other chemicals, that threaten the habitat of aquatic organisms in water bodies in the Tampa Bay region, and in areas of Tampa Bay, (3) an assessment of current stormwater treatment technologies for the removal of disease-causing organisms is needed in order to effectively protect human health and restore surface water quality, (4) maintain stream flows to ensure adequate fresh water to preserve oligo- and meso-haline estuarine habitats, as well as to ensure sufficient dissolved oxygen to sustain populations of aquatic organisms in streams and estuaries, and (5), initiate a comprehensive monitoring program to ensure adequate data are available for managing water quality in the watershed.

Natural Systems. (1) Curb the expansion of invasive exotic plant species that have degraded natural systems in the watershed, (2) implement remedial and preventive actions to address the expansion of urban, suburban, agricultural, and industrial land uses has resulted in the degradation, fragmentation, and destruction of natural habitats in the watershed, (3) the spatial extent of natural habitats needed to preserve ecosystem integrity needs to be determined, (4) wildlife corridors must be provided to allow for the movement of animal and plant species from one "core" area of natural habitat to another, thus promoting the exchange of genetic material between populations, (5) the coverage of submerged aquatic vegetation (SAV) should be monitored on a regular basis to assess the health of estuarine systems and to gauge the health of Tampa Bay, (6) ensure adequate habitat and good water quality for maintaining fish populations in Tampa Bay, and (7) develop minimum flows and levels on water bodies in the watershed to maintain or restore the health of natural systems.

Alafia River Watershed

The Alafia River originates from several creeks that converge into a centralized riverine system flowing westward from Polk County through Hillsborough County to Tampa Bay. The Alafia River flows 24 miles westerly into lower Hillsborough Bay, with an estimated drainage area of approximately 270,000 acres. The Alafia River watershed extends over parts of two counties, including much of the central eastern section of Hillsborough County and a smaller area of west-central Polk County. It incorporates parts of Lakeland, Plant City, Mulberry, the community of Brandon and large expanses of rural or undeveloped farm and phosphate mining lands. Agriculture is the watershed's predominant land use, including citrus, poultry, dairy, strawberries and other row crops. The discussion of each area of responsibility below sets forth the important issues in the watershed.

Water Supply. The Alafia River watershed is in an area where numerous studies and field observations have documented the decline of wetland, lake and groundwater levels associated with groundwater withdrawals. Moreover, the demand for water continues to increase as the population grows. Seasonal changes also have water use implications since demand is usually the greatest during drier periods. A priority issue is water level declines associated with water withdrawals.

Flood Protection. Continued encroachment into the floodplain diminishes storage and conveyance capacity of storm water. These alterations can result in increased flood levels upstream or downstream of the impacted area. Development can also increase the amount of discharge to an area through drainage system enhancements and increased impervious area. Additional detailed flooding information is needed for implementing regulations to address this issue. Priority issues are: (1) floodplain encroachment, and (2) data management.

Water Quality. The Alafia River, as well as the lakes and other aquatic resources in the watershed, provides high quality recreational opportunities for area residents and tourists alike. The river's water quality, however, continues to be threatened by point source discharges, runoff from mined and barren lands, urban stormwater runoff and intermittent clay settling pond and acid spills. Priority issues are: (1) nutrient pollution, and (2) toxic contamination.

Natural Systems. Most, if not all, issues related to natural systems within the Alafia River watershed are directly or indirectly related to development and land use activities. The extent of mining throughout the eastern watershed is expected to cause widespread changes to the landscape, as natural lands are cleared, excavated and eventually restored. Catastrophic acid spills, which have occurred on several occasions in the last few decades, have had an enormous effect on the biological communities that inhabit or utilize the river. In the long term, it is expected that population growth and urbanization will continue to shape conditions within the Alafia River watershed. Priority issues are: (1) loss and alteration of natural lands, and (2) intermittent industrial spills.

Peace River Watershed

The Peace River watershed, at 2,350 square miles in size, is the largest watershed in the District. It encompasses much of Polk and Charlotte counties and virtually all of Hardee and DeSoto counties. The river flows southward a distance of 75 miles from its headwaters at Lake Hancock in Polk County to its confluence with Charlotte Harbor near the town of Punta Gorda. Land elevations range from sea level at the river's mouth to more than 200 feet above mean sea level at the headwaters. Upstream of Arcadia, the channel of the Peace River is generally well-defined. Below Arcadia, the channel becomes braided and the width of the floodplain increases substantially, exceeding

a mile in some places. During periods of low river flow, the system is tidally influenced from Fort Ogden to the mouth at Charlotte Harbor.

Surface flows in the Peace River have been affected by a variety of factors, including long-term variations in rainfall, land use activities that have altered surface hydrology patterns, and groundwater withdrawals supplying industrial, agricultural and municipal water use needs. The watershed has experienced a long history of agricultural and industrial land uses that have relied heavily on groundwater resources. Large-scale mining and processing of phosphate has taken place in the upper Peace River basin since the late 1800s and has severed hydrologic connections with some historic tributaries and contributed to the decline in groundwater levels and river flow. The following discussion describes the state of each area of responsibility in the watershed and the priority issues developed by the team.

Water Supply. The Peace River watershed lies wholly within the Southern Water Use Caution Area (SWUCA), which extends across 5,100 square miles in the southern portion of the District and was designated in response to long-term declines in groundwater levels. The Peace River watershed accounts for 46 percent of the total land area of the SWUCA and about 48 percent of groundwater withdrawals. In northern portions of the watershed, the Floridan aquifer is the primary source of water for industrial uses, agricultural irrigation and domestic supply. In the southern watershed, the Floridan is highly mineralized and the surficial and intermediate Hawthorn aquifers become the major sources of groundwater supply. Although domestic water use has been comparatively small, population growth from 1990 to the present has exceeded that of the District as a whole and the lower Peace River is projected to serve as the primary source of potable water to meet a growing public demand.

Water supply priorities in the watershed include: (1) an evaluation of streamflow reductions in the upper Peace River, (2) determination of the extent to which phosphate mining has altered flows in the river, (3) implementation of plans to restore stream flow to altered subbasins where such restoration is feasible, and (4) establishment of minimum flows based on the ecological requirements of the river and associated natural systems.

Flood Protection. Recent flooding during the 1997-1998 El Niño event placed additional emphasis on the need for more accurate floodplain delineation and improved coordination among the District and local governments in maintenance of existing flood protection facilities and prevention of inappropriate development in floodplains. Funding has been awarded through the District's Cooperative Funding Program for several projects that address flooding problems within the watershed, including aerial mapping projects that will allow refinement of floodplain delineation. A model approach to improving coordination among the District and local governments is also in development and will use Memoranda of Understanding to clearly define the responsibilities of each party in flood protection matters.

Water Quality. Natural phosphate deposits produce extremely high phosphorus loadings in surface waters of the watershed and a number of water bodies exhibit hypereutrophic water quality conditions in response to these loadings. Phytoplankton blooms occur seasonally in the tidal reaches of the river and periodically cause chlorophyll concentrations to reach hypereutrophic levels. Water quality conditions in estuarine segments of the river appear less degraded than those in many freshwater portions of the watershed. Lake Hancock has consistently exhibited some of the poorest water quality found in Florida. Its discharges have been implicated in water quality problems experienced at the Peace River water treatment

facility, and the restoration of Lake Hancock ranks as one of the highest priorities for this watershed. A refined nutrient budget for the lake is nearly complete and restoration alternatives are being evaluated.

Natural Systems. Significant physical alteration of the landscape within the Peace River watershed has occurred, including agricultural development, phosphate mining, and urbanization. This conversion has produced corresponding degradation to natural systems and habitat destruction. Modifications to surface hydrology, including the severance of natural drainage features that historically discharged to the Peace River, have resulted in impacts to the aquatic communities of the river and terrestrial communities within the watershed. Much of the remaining natural land cover occurs as small, disjunct patches.

Priorities for natural systems protection include the restoration of water quality and hydrologic function in the upper watershed for the benefit of wildlife dependent on the aquatic habitat of the river. A coordinated approach to land protection that will produce a viable network of linked conservation lands will also be critical to the future of the watershed and should include various alternatives to fee simple acquisition. A GIS-based analysis of the watershed has been completed and identifies important remaining natural areas. Another priority is reclamation planning for sites that have been, or are proposed to be, mined for phosphate. The District is participating in a Team Permitting effort for three newly-proposed mines that will encompass a total land area of 57,000 acres. This approach is more broad in scope than previous reviews for phosphate mining and provides a vehicle for addressing mining on a “whole mine” basis that will produce post-mine landscapes that maintain hydrologic connections with the Peace River.

Lake Wales Ridge Watershed

The Lake Wales Ridge CWM watershed is centered around the Lake Wales Ridge. The Ridge is comprised of a long, sandy highland spine from one to twenty-five miles wide and approximately one hundred miles long in central Polk County and west Highlands County. This ridge acts as a flow divide for two major river basins, the Peace and Kissimmee. On the eastern side of the Ridge, surface water drains to the Kissimmee River; and on the western side of the Ridge, in Polk and northern Highlands counties, surface water drains to the Peace River. This watershed is at a higher elevation than any other location within the SWFWMD boundaries and serves as a major recharge area for the Floridan aquifer. Water in the Floridan aquifer moves beneath the watershed toward the Atlantic Ocean on the east and toward the Gulf of Mexico on the west.

A large percentage of the states’ citrus crop grows on the well-drained sandy soils that are a major defining component of the region. Many citrus groves were established in this area after agriculturalists learned that citrus could survive on the once considered useless “Sugar Sand” of the Ridge. Climate played a key role in this development after a devastating freeze in 1895 that virtually wiped out the citrus industry in Florida. Growers learned that citrus planted near some of the lakes in the region survived the freeze. The risk of freeze damage was also reduced by the more southerly location.

The CWM process has increased communication among District staff and between District staff and staff of other agencies, such as Polk County, Highlands County, and the City of Sebring. Open communication between agencies has promoted a broader sense of understanding of issues within our watershed area. Several cooperative funding projects have been initiated through discussions with staff from other agencies.

Priority issues identified by the Lake Wales Team are: (1) Nitrate and pesticide contamination of the surficial aquifer, (2) nitrate contamination of lakes and streams, (3) loss of scrub habitat, (4) declining or low lake levels, and (5) SWUCA-related issues. The state of each area of responsibility in the watershed is described below.

Water Supply. In 1997, a combined total of about 475 million gallons per day (mgd) of fresh water was withdrawn from the surface and groundwater systems in the Lake Wales Ridge area. The primary use of groundwater in the area is for agriculture. Mining is the second largest user and withdrawals for public supply are next. The Floridan aquifer withdrawals represent about 93 percent of total groundwater use in the region. The Lake Wales CWM study area has limited potential for future/groundwater supply development. The area is located within the Southern and Highlands Ridge WUCA. In the SWUCA, long-term declines in the Floridan aquifer have led to regional saltwater intrusion along the coast. In the Highlands Ridge WUCA, long-term declines in lakes have been documented and associated with increases in groundwater withdrawals.

Flood Protection. Drainage in the Lake Wales Ridge area has been undertaken for various purposes, including to control lake levels, increase agricultural production and control flooding. This drainage has allowed land uses not previously possible, and at the same time has caused a reduction in surface water and surficial aquifer groundwater storage adjacent to the Lake Wales Ridge. This can cause a reduction in total water available to the lakes, increasing the probability of a decline in lake levels. In addition to problems with low lake levels, runoff potential for the Lake Wales Ridge watershed is low since most of the soils are classified as high-infiltration types.

Water Quality. There are approximately 123 lakes within the Lake Wales Watershed. They collectively comprise approximately 10 percent of the land surface area within the Lake Wales Watershed. Approximately 44 lakes are contained within Polk County, while approximately 79 lie within Highlands County. The Lake Wales Ridge is dotted with numerous sinkhole lakes. Sinkhole lakes occur typically in deep-funnel shaped depressions in a limestone base. Generally, these lakes are characterized by clear, alkaline water with high mineral content. Over 100 lakes twenty (20) acres in size or greater have been identified on the Ridge. Streams and wetland systems provide surface inflow to some lakes; however, much of the drainage is considered internal and the groundwater system transports water to points of discharge.

Over 95 percent (76 lakes) of the lakes in Highlands County were sampled between 1992 and 1996 by the District as part of its Ambient Monitoring Program. The data collected were compared to a database for Florida lakes from the DEP. The lakes of Highlands County have generally higher water quality than most lakes in Florida. However, the concentration of nitrates for Highlands County was abnormally high. Unexpectedly, most of the lakes with high nitrate concentrations were lakes with the highest water clarity, or those lakes that appear to have the best water quality. These lakes were typically the deepest lakes, which are primarily located along upland ridges of the county.

Natural Systems. The Lake Wales Ridge contains some of the most imperiled and unique habitats in the state. The complex of sand ridges and ancient dune fields that form the Ridge support one of the major remaining concentrations of inland peninsular scrub. Scrub is a fire-controlled habitat and is often considered Florida's most distinctive ecosystem. It is an arid upland shrub community dominated by a layer of evergreen, or nearly evergreen oaks or Florida rosemary, with or without a pine

overstory, occupying well-drained, infertile, sandy soils. An estimated 40 to 60 percent of scrub plant and wildlife species live nowhere else on Earth. The flora and fauna of the Lake Wales Ridge includes one of the highest concentrations of threatened and endangered species in the United States. In fact, Highlands County is ranked 11th in the nation for having the highest number of threatened and endangered species. Approximately 85 percent of the dry uplands (including scrub) on the Lake Wales Ridge has been lost to citrus cultivation and residential and industrial development. Almost all remaining Ridge habitat is under the imminent threat of development.

Little Manatee River Watershed

The Little Manatee River originates in eastern Manatee and Hillsborough counties. The river flows from east to west for several miles in Hillsborough County until it converges with the South Fork of the Little Manatee River, the southern tributary originating in Manatee County, and finally discharges into Tampa Bay. The Little Manatee drains approximately 222 square miles of land. The maximum length of the main riverine system is approximately 40 miles. The Little Manatee River watershed is bordered by the Tampa Bay watershed on its south, west and north sides, by the Alafia River watershed to the north, Manatee River to the south and the Peace River watershed to the east. The communities of Ruskin and Sun City-Wimauma are within the watershed's boundaries. Agriculture is the predominant land use within the watershed with row crops, pasture and citrus groves. Urban land uses predominate along the western portion of the watershed, near the coast. Commercial areas can be found along the Bay and U.S. Highway 41, while industrial developments are generally located along the Seaboard Coast Line Railroad. Concerns regarding each of the AORs in the watershed are discussed below.

Water Supply. The SWUCA has experienced declines of lake levels and advancing saltwater intrusion in coastal regions. Data indicate that the potentiometric surface in the Floridan aquifer has declined significantly in the past 40 years for the area. United States Geological Survey's (USGS) studies reveal seasonal groundwater fluctuations as great as 50 feet in 1989. In addition, water quality monitoring data indicate increasing trends for sulfates, total dissolved solids and chlorides across the coastal counties. A priority issue is the water level declines associated with groundwater withdrawals.

Flood Protection. The existing urban area within the 100-year flood zone is approximately 1,638 acres. In the future, it is expected that this area will increase by an additional 7,271 acres for a total of 8,909 acres. In addition, there are some concerns with the lack of detailed flooding information for the watershed. For example, the area within the Federal Emergency Management Agency (FEMA) 100-year is about 20,603 acres, while the watershed's wetland acreage is significantly greater. Wetland areas should be included within the flood zone areas. A priority issue is data management.

Water Quality. Studies indicate that water quality has declined since the river's designation in the 1980s as an Outstanding Florida Water. In addition, there have been periodic violations of Class III dissolved oxygen standards in the tidal reaches of the river. A more thorough investigation of these issues is necessary for the identification of solutions. A priority issue is to reassess water quality trends and dissolved oxygen concentrations in the river.

Natural Systems. The watershed's natural system issues are the product of human impacts within the area. The watershed has undergone significant alteration from forested uplands and wetlands to a mixture of urban, agricultural, mining and relic biological communities. Currently, an estimated 38.6 percent of the historical plant communities remain, with 61.4

percent of the habitats in the watershed having experienced some form of development. Land conversions and its requisite infrastructure elements (e.g., roads, utility systems, landfills, etc.) are expected to continue to shape conditions within the remaining natural systems. A priority issue is habitat loss, alteration and fragmentation.

Manatee River Watershed

The Manatee River Watershed extends over most of the northern and western parts of Manatee County, with small portions extending into northern Sarasota County and southeastern Hillsborough County. The Manatee River begins at an elevation of about 130 feet in marshes in the northeastern part of Manatee County near Four Corners and flows approximately 45 miles in a westerly direction to southern Tampa Bay and the Gulf of Mexico. The Braden River is also a major tributary to the watershed. Major urban centers include the cities of Bradenton and Palmetto.

The 360 square-mile watershed is unique in that it contains the Lake Manatee Reservoir on the Manatee River and the Bill Evers Reservoir on the Braden River which, combined, provide 70 percent of the potable water supply within Manatee County. Ground water is the major source for non-potable uses. The watershed is located within a SWUCA. Most urban and built-up areas are concentrated in the western portion of the watershed, while agricultural and natural systems predominate in the remaining areas. Population growth continues to create new issues for land and water resource planning. Promoting land management strategies that maintain the recreational, water supply and environmental resources of the watershed is the challenge. Many resource assessments have been completed that have aided in the formulation and evaluation of potential issues. Concerns regarding each area of responsibility in the watershed, and strategies to address them, are described below.

Water Supply. The majority of the watershed lies within the Most Impacted Area (MIA) of the SWUCA, where no new groundwater withdrawals are being permitted. Therefore, new quantities must come from alternative sources such as surface, reused, reclaimed, and desalinated waters. To date, the District has allocated \$19 million for alternative water supply projects in Manatee and Sarasota counties. Due to the future water supply demand of the area, the District has initiated the development of a Regional Water Supply Plan (RSWP) that will evaluate the potential water supply capacity of the following: (1) surface water/storm water, (2) reclaimed water, (3) seawater desalination, (4) brackish groundwater desalination, and (5) agricultural conservation, and (6) non-agricultural conservation.

Flood Protection. Within the watershed, flooding can result from heavy-volume rainfall and/or tidal surges from tropical storms. Protection from these events can be accomplished by identification of flood-prone areas and accurate determination of base flood levels. Strategies for accomplishing these goals are as follows: (1) implement universal data standards for watershed assessment projects that promote data exchange, (2) provide a central repository of watershed information using a Geographical Information System, (3) implement management policies that evaluate cumulative runoff impacts associated with development, (4) develop hydrologic/hydraulic modeling protocol for proper prediction of flood levels, (5) establish regulatory guidelines for stormwater systems that are used for flood protection and reuse, (6) determine ownership, operation and maintenance responsibilities for flood management systems to maintain their design level of service, and (7) integrate land-use activities with floodplain management.

Water Quality. Water quality in the Manatee and Braden rivers is generally classified as “fair to good” with nutrient, dissolved oxygen, coliform bacteria, and some metals identified as problems. Nutrient loading is a potential threat to the water quality in the reservoirs that are showing trends toward higher eutrophication. As a result, the following actions have been identified: (1) continue and enhance ongoing monitoring and data management of pollutants, (2) develop and implement management practices that reduce non-point nutrient loads to the Lake Manatee and Bill Evers reservoirs that have led to algal blooms that complicate the water supply treatment process, (3) assess and develop strategies to reduce the accumulation of toxic contaminants in reservoir sediments, (4) support of the Tampa Bay Estuary Program to reduce nitrogen loading to the Bay, (5) assess and develop strategies to reduce the concentrations of fecal and total coliform bacteria levels in the rivers, (6) assess and evaluate the feasibility for introducing reclaimed water in the reservoir watersheds, and (7) establish minimum flows and levels (MFLs) for the river that maintains the ecology of the area.

Natural Systems. As land is developed to serve human needs, the size, condition, distribution, and abundance of biological communities are permanently altered. Declines in water quality and wildlife populations are often in direct correlation to the amount of land development. To offset these trends, Manatee County has experienced an aggressive land acquisition program whereby over 27,000 acres within the watershed have been purchased. A coordinated effort is now being devised whereby natural area cores and corridors can be linked between watersheds to maximize land acquisition benefits. In addition, Manatee County has expressed interest in acquisitions that specifically target diminishing habitats. To enhance the land acquisition program, the following actions are recommended: (1) develop an inventory between historical and current habitat distributions to determine relative losses,

(2) develop correlations between existing wildlife populations and functional habitats to identify areas for restoration and preservation, (3) coordinate regional and state acquisition programs to maximize greenbelts and wildlife corridors, (4) develop alternatives to land acquisition programs to preserve ecosystem functions within a watershed, and (5) identify land practices and pollution sources that can impact natural system functions such as nutrient loading, hazardous spills, or other discharge impacts.

Myakka River Watershed

The Myakka River Watershed is located in west-central Florida, extending over parts of five counties: Manatee, Sarasota, Hardee, DeSoto and Charlotte. The watershed boundaries cover an area of about 598 square miles. The river begins in marshes in southeastern Manatee and western Hardee counties near Myakka Head and flows approximately 66 miles in a southerly direction, discharging to Charlotte Harbor. The 34-mile segment of the river within Sarasota County has been designated a Wild and Scenic River by the state of Florida and, along with the Lower Myakka (estuarine portions), is an OFW.

The watershed is predominantly rural, with agriculture and conservation/recreation being the major land uses. The City of North Port is the only incorporated area within the watershed. Other developed areas include rural Myakka City, in the river’s upper reaches, increasing urban development in the lower, more estuarine reaches, especially south of U. S. Highway 41 and portions of Port Charlotte and the Cape Haze peninsula. The watershed lies entirely within the SWUCA. Most of the watershed above Upper Lake Myakka lies within the Eastern Tampa Bay WUCA and abuts the MIA, an area where no new water withdrawals are allowed.

The main focus of the Myakka River CWM Plan is the protection and preservation of the watershed and Charlotte Harbor. As one of the main tributaries to the harbor, virtually all activities in the watershed could impact perhaps the most productive estuary in the state. Among other activities, the CWM Plan and process will try to prevent degradation of existing water quality and control exotic aquatic plants to reduce negative impacts on water quality; to assist local governments to prevent flood problems by identifying and analyzing flood-prone areas and limiting development as appropriate; to preserve the existing natural systems in the watershed; and to maximize water conservation to lessen the need for additional sources and, when necessary, develop new sources with a strong focus on environmental preservation. The state of each area of responsibility in the watershed is described below.

Water Supply. The water resources within the Myakka River watershed provide water supply for agriculture, public supply, industry and recreation. The permitted withdrawals in the watershed are around 172 mgd from traditional sources (surface and 159.6 ground water). The largest permitted withdrawals in the watershed are for agriculture (about 130 mgd) and are pumped almost entirely from groundwater sources. Public supply and mining/dewatering are the second and third largest permitted uses, while other use-type withdrawals make up only a few percent of demand. The only major surface water withdrawal currently permitted in the Myakka River watershed is from the Myakkahatchee Creek/Big Slough drainage system. An off-stream reservoir in the watershed is a potential supply source for future potable water needs in the area and the City of North Port is investigating the use of aquifer storage and recovery wells to save water from excess wet season flows in Myakkahatchee Creek.

Flood Protection. The river basin is characterized by a very shallow slope to the main channel, a wide floodplain and meandering main channel. Flooding results from runoff and stream overflow, and from tidal surge in the coastal areas due to hurricanes and tropical storms. Topographic relief averages 1.8 ft./mile and is greater in the upper basin than in the lower. The Myakka River may be affected by high tides for more than four miles upstream from U.S. Highway 41, and the Blackburn Canal may be affected by tides more than five miles upstream from Venice By-Way. Tatum Sawgrass, a large depression about 14 square miles in size, was ditched and diked to allow for agricultural development. The resulting loss of storage and attenuation provided by Tatum Sawgrass has increased downstream flood peak discharges and flood heights. Additionally, both agricultural and urban development in other parts of the watershed have changed the volume and timing of runoff when compared to historical patterns.

Water Quality. Water quality in the Myakka River watershed is generally good, with most tributary streams classified by DEP as fair to good. However, some areas are classified as "poor." Future increases in loadings of the nitrogen and phosphorus, which stimulate the growth of aquatic plants and drive the process of cultural eutrophication in surface water bodies, appear to represent the greatest threat to water quality in the Myakka River system, including the estuarine portion of the lower river.

Natural Systems. The watershed is characterized by hardwood swamps, freshwater marsh, pine flatwoods and palmetto prairies. About one-fourth of the watershed is in public ownership. The very good water quality of this watershed supports productive freshwater and estuarine habitats. Because the Myakka Basin is relatively undeveloped and shelters a large diversity of habitats, many endangered and threatened plant and animal species are found. It is also a popular recreation area. Unfortunately, the estuary is threatened by

encroaching growth from development to the east. The Upper Myakka Lake, located within the Myakka River State Park, is one of the few publicly accessible freshwater fishing areas in Sarasota County. Tree die-off in the upper portions of the watershed, including the Flatford Swamp area, is a significant issue within the watershed.

Southern Coastal Watershed

The Southern Coastal Watershed extends along the southwestern shoreline of Florida from the mouth of Tampa Bay to the mouth of Charlotte Harbor. It is bounded to the north by the Tampa Bay/Anclote Drainage and the Manatee River watershed, and to the east by the Myakka River watershed. More than 60 miles of barrier islands and the estuaries they protect are included in the watershed. Most of the watershed falls within the Manasota Basin of the District, although the southernmost section lies within the Peace River Basin. The watershed includes portions of Manatee, Sarasota and Charlotte counties. Major urban centers include portions of Bradenton, as well as all of Sarasota and Venice.

The watershed contains the watersheds of Sarasota Bay, Dona and Roberts Bays, Lemon Bay, and Gasparilla Sound. The watershed is highly developed, particularly in the northern portions. Fortunately, many resource assessments have been completed in the watershed, and much information already exists to aid in the evaluation of potential issues associated with the above-mentioned AORs.

The Southern Coastal Watershed Management Initiative Team (Team) includes members from local governments and both the Sarasota Bay and Charlotte Harbor National Estuary Programs (NEPs). In addition to reviewing and ranking over two dozen cooperative funding requests for FY 1999 and FY 2000, the Team developed, wrote and coordinated the review of the draft Management Plan. This Plan has been reviewed by staff representing Manatee, Sarasota

and Charlotte counties, the City of Venice, DEP, and both the Sarasota Bay and Charlotte Harbor NEPs.

While developing the Plan, it was determined that water quality was poorly characterized for portions of the watershed. Based upon the Team's determination that there was a need for a comprehensive assessment of water quality and seagrass resource data in Lemon Bay, a collaborative project between the District and DEP was designed and implemented. Two cooperative funding requests have been received for restoration projects in the Southern Coastal watershed (Lemon Bay Preserve and Amberjack Slough), based in part on participation of Sarasota County and the Charlotte Harbor Environmental Center in the CWM Initiative. In addition, two required technical projects were identified – the need for a hydrologic model of the effects of Cow Pen Slough on Dona Bay, and the need for a linked nutrient loading-water quality model for Lemon Bay.

After reviewing available information gathered from completed and ongoing efforts, the following issues have emerged as priorities.

Water Supply. (1) Seek greater consistency between water resource and land use planning in Local Government Comprehensive Plans, (2) improve compliance with water shortage restrictions and year-round conservation measures, (3) develop alternative water sources, (4) adopt minimum aquifer levels for the Intermediate aquifer, (5) improve coordination between land and water planners, and (6) promote conservation and reuse.

Flood Protection. (1) Enhance flood protection data collection and management efforts, (2) acquire additional floodplain information, (3) effectively manage and/or regulate for increased runoff associated with urbanization of the watershed, (4) coordinate water resource planning and land use planning, (5) determine ownership, operation and maintenance

responsibilities for flood management systems, (6) seek consistent sources of funding for flood management systems, and (7) educate the public on the role that floodplains play in flood protection and the probability of flood events in low-lying areas.

Water Quality. (1) Continue ongoing monitoring and data management activities in Sarasota and Manatee counties, (2) expand ongoing monitoring and data management activities into Charlotte County, (3) determine the potential ecological consequences of increased nutrient loads into Lemon Bay, (4) develop a detailed hydrologic model to better understand the ecological impacts associated with flood control practices in the Cow Pen Slough subbasin, (5) continue ongoing efforts to reduce wastewater-related point and non-point source pollutant loads throughout the watershed, and (6) continue ongoing efforts to reduce stormwater-related non-point source loads throughout the watershed.

Natural Systems. (1) Continue ongoing efforts focused on enhancing, restoring and creating wetlands in the watershed, and (2) protect existing natural systems within the watershed through purchase and the use of conservation easements.

Section 3. Summary

As noted, CWM plans for the District's eleven major watersheds are in various stages of development as we enter the year 2000. The Hillsborough River Watershed Plan has been completed and serves as both a "pilot project" and an example of what can be accomplished. It is the objective of the District that these results be expanded and enhanced in a collaborative fashion with local governments and other participants for all the remaining ten watersheds. The quality of Florida's water resources, natural environment and quality of life depend in large part on realizing this collaborative approach between local governments, the District and others.

Chapter VI. Implementation Coordination

Section 1. Introduction

The Southwest Florida Water Management District (SWFWMD or District) is responsible for the management, protection and conservation of water resources in an area of approximately 10,000 square miles in west-central Florida. In order to successfully accomplish these diverse purposes, it is necessary to make best use of all available resources and to ensure that other agencies having access to, or impacts on, water are included in all District considerations. Similarly, the District needs to be involved with growth management activities of other governments to assist decision-makers in careful consideration and protection of water and related natural resources. The challenge of achieving effective, two-way coordination with other levels of government can begin to be understood by noting that the District interacts, to varying degrees, with:

- ❖ 98 local governments, including all or part of 16 counties and such major cities as Tampa, St. Petersburg, Clearwater, Sarasota, Bradenton, and Lakeland;
- ❖ over 260 public and private water utilities;
- ❖ at least a dozen key state and federal agencies;
- ❖ five regional planning councils;
- ❖ four other water management districts, three regional water supply authorities and numerous special districts (from 16 school boards to flood control districts).

Opportunities for District coordination with other governmental agencies exist at the federal, state, regional, local and other levels. In almost all cases, the benefits from coordination are mutual.

While the District **provides** considerable information to other entities, the information **received** from others greatly enhances and facilitates accomplishment of water management. This two-way street is illustrated by a broad range of interactive mechanisms and programs discussed in this section.

Water management, particularly at the regional level, requires a close partnership between all levels of government (as well as both public and private entities) to assure that activities are conducted in a manner consistent with the long-term protection needs of Florida's water resources. One example is development of the management plan for the Southern Water Use Caution Area (SWUCA) and the highly coordinated, representative process it has entailed at the local, regional and state levels.

This chapter covers current efforts that relate to implementation coordination and the District's strategy for enhancing such efforts. Input from individual citizens, environmental, industrial, agricultural and other affected groups is also an important part of the District's creation of a representative Plan, and is addressed in the next chapter on Procedures for Plan Development.

Section 2. Summary of Current Coordination Efforts

The District is aware of its responsibilities as a public organization. For this reason, a strong public communication and outreach program to other governments has been in effect for some time. The most basic purpose of such efforts is to provide a comprehensive program of coordination, communication and cooperation with all appropriate parties to assure effective and efficient water resource management. This purpose is supported by a basic Governing Board policy:

Coordinate with other agencies, local governments, water user groups, and the general public in the formulation and pursuit of water management goals and objectives.

This section describes the District's approach to intergovernmental coordination as practiced by our Boards and staff, and implemented through resource-specific programs. Figure 32 depicts the many players in the process by depicting agencies responsible for at least some aspect of water management. Understanding the nature of these responsibilities, and how they interface with the District's charge and authority, is a key to effectively working together.

1-1 Governing Board

One of the primary coordinating aspects of the SWFWMD is the 11-member Governing Board. This is the policy-making body of the agency that typically meets on the final Tuesday and Wednesday of each month, with workshops sometimes scheduled to discuss specific subjects. All meetings are publicly noticed, open to all who wish to participate, and represent opportunities for officials and citizens to address District policies, plans, programs and budgets.

The Governing Board has its most direct impacts on other levels of government through its regulatory and funding decisions. Chapter 373, Florida Statutes (F.S.), authorizes the District to manage and protect water resources through a permitting system that includes rules and regulations for Water Use, Surface Water, Works of the District, Well Construction, Water Shortage and Water Conservation measures. The Board has moved in the direction of attempting to balance their regulatory role by funding incentive programs such as agricultural metering assistance, the New Water Sources Initiative and the Tampa Bay Partnership Agreement as a way of easing impacts on other governments, while not sacrificing strong management and protection of the resource. The development of these efforts has actively involved those affected by them.

1-2 Basin Boards

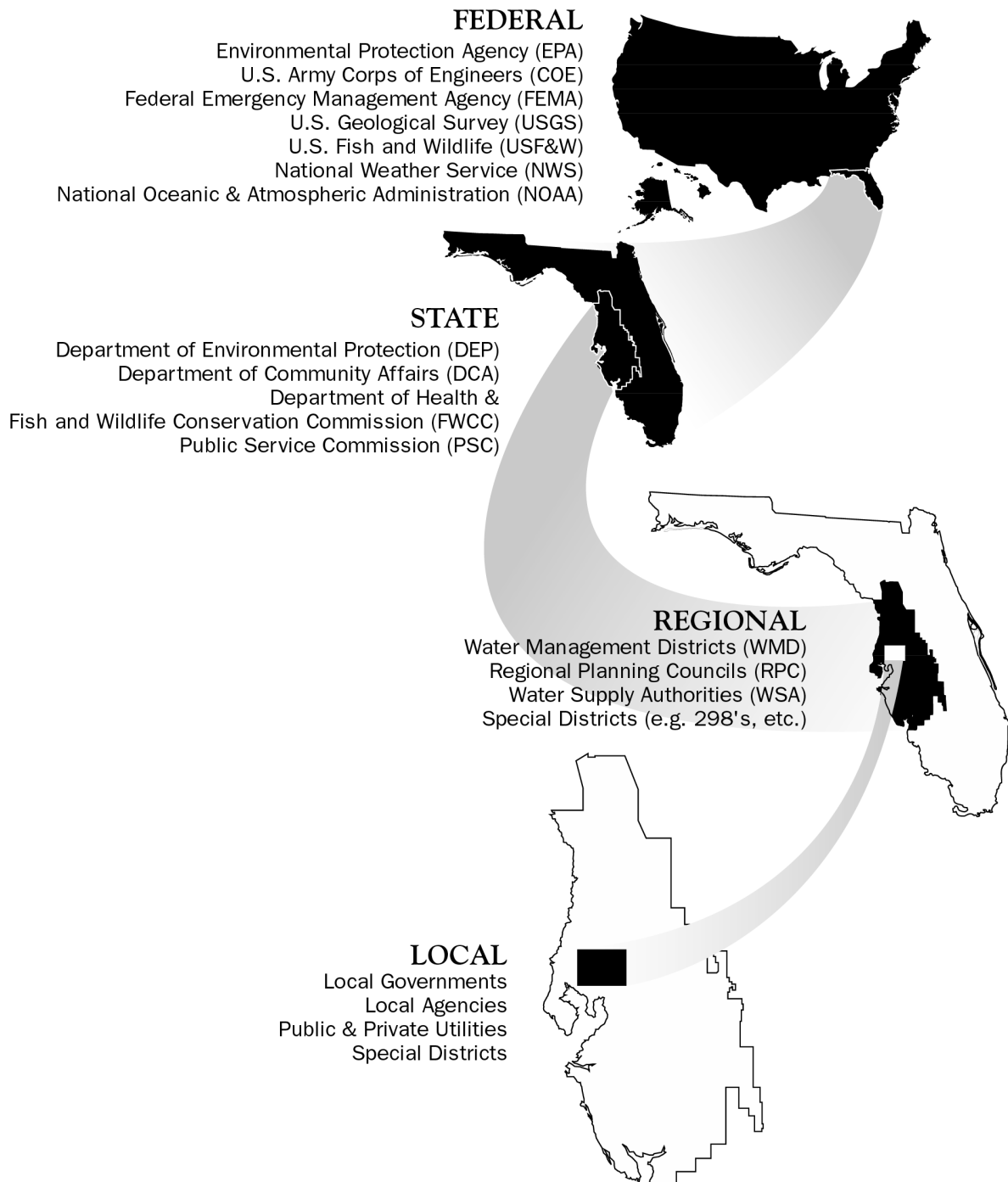
The eight Basin Boards of the SWFWMD have specific functions and duties that are consistent with Chapter 373, F.S., and the programs of the Governing Board. Their purpose is to identify and evaluate key water resource management issues in order to develop and fund management strategies to address them. Like the Governing Board, Basin Boards hold regularly scheduled (every other month) meetings open to the public.

The Basin Boards are facilitators in the resolution of non-regulatory water management issues for a number of other governments. It is at the Basin level that intergovernmental water resource programs are implemented, monitored and evaluated for improvement. The Basins are a sounding board for the District, a means of obtaining feedback from local governments and citizens. Basin Boards also serve as funding partners for local governments and others in addressing mutually beneficial water resource solutions.

The District, through its eight Basin Boards, has an established Cooperative Funding program that provides financial assistance on a cost-share basis primarily to local governments for regional water resource projects. Figure 33 shows the levels and pattern of funding under this program since its inception. During fiscal year (FY) 1999, the District, through cooperative funding, is providing about \$19 million for a variety of projects. The program requires that project proposals be consistent with the local government's comprehensive plan, the District Water Management Plan, and the individual Five-Year Basin Plan. Examples of funded activities include: indoor plumbing retrofit programs, watershed analyses, agricultural impacts to water quality, stormwater management master plans, wellhead protection programs and reuse water development assistance.

Figure 32.

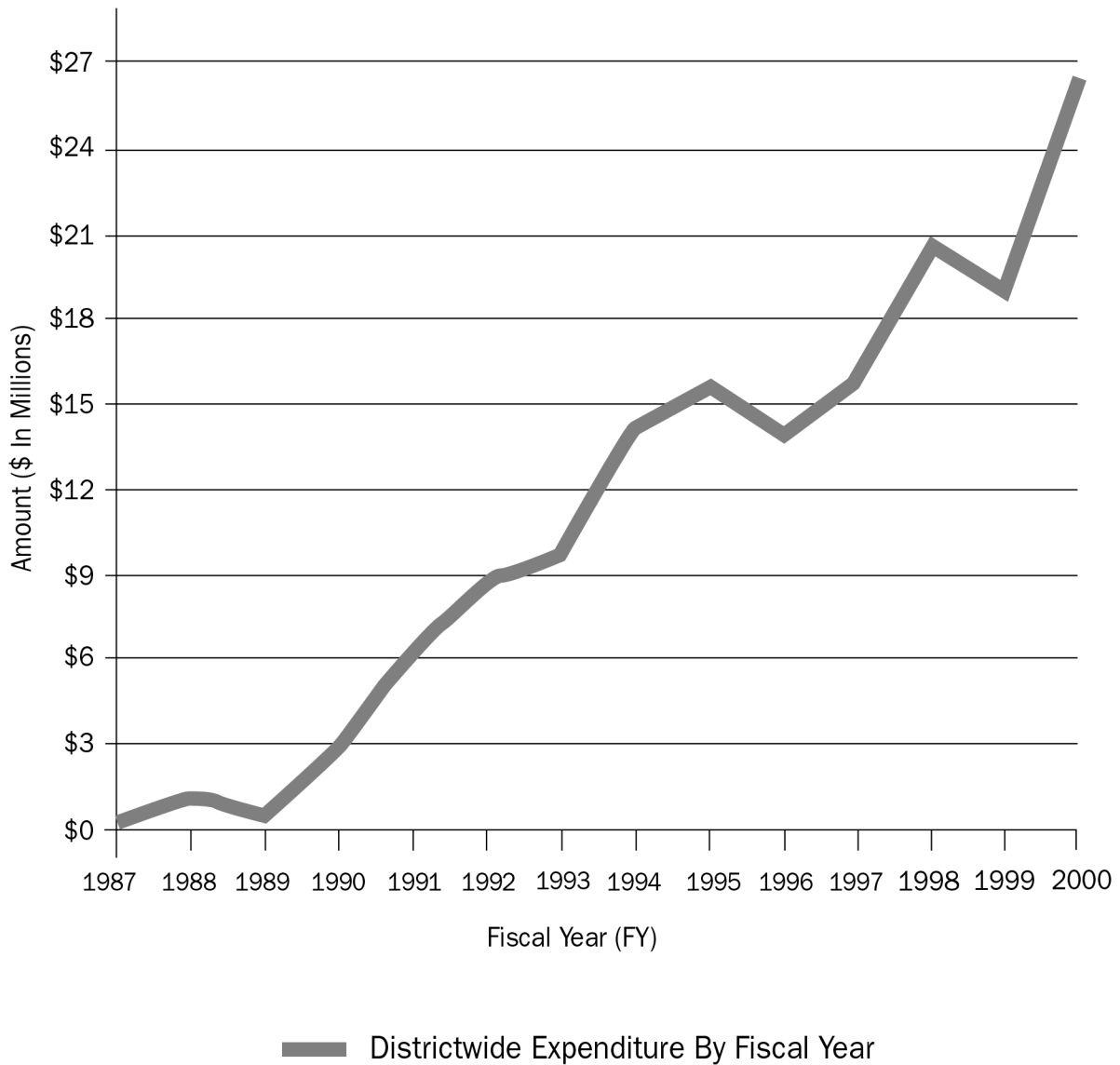
Agencies Responsible for Water Management in Southwest Florida



Source: SWFWMD
December 1999

Figure 33.

Cooperative Funding Program Expenditure By Fiscal Year: 1988–2000



Source: SWFWMD, Planning Department
December 1999

1-3 Staff Coordination

While nearly all agency staff have regular interaction with various other levels of government, the District has several key departments that play significant roles in implementation coordination. Among these are Executive, Community Affairs, Planning, Communications and Resource Regulation. A brief description of their respective roles follows.

1-3.1 Executive

Executive staff direct District activities in support of the Governing and Basin Boards, implement Board policies and direct overall staff operations and activities. This means Executive is a critical policy link between the agency and legislators, local governments, other water management districts, water supply authorities, advisory committees and work groups (such as those established to address the SWUCA).

An Ombudsman position was initiated at the District during FY 1998, reporting directly to the Executive Office. It serves as one of the many continuing efforts of the District to maintain and enhance communication and coordination with permittees, residents and others in the District.

1-3.2 Communications and Community Affairs

The Communications and Community Affairs departments were recently combined. Below describes the functions within their area of responsibility.

Communications is charged with the responsibility of coordinating, facilitating, clarifying and disseminating information regarding the water resources managed and protected by the District. These duties are exercised at various levels of intensity, from individual citizens to local governments, and from interaction with the media to communication with elected officials.

The department is focused on extensive public outreach through the media, targeted outreach programs, special initiatives and Cooperative Funding projects. Initiatives utilize the mass media and public-private partnerships to convey specific messages that provide information about the water resource and encourage individual involvement in water issues and water conservation efforts. The District also has an in-school education program that provides water resource curricula as a means of assuring today's children are tomorrow's water resource stewards. This effort has become a significant coordination link for the District in terms of local governments, school boards and the State. For example, the District, through its Basins (cooperative funding and education initiatives) has assisted local governments and school boards in constructing and operating environmental education centers (including those on District-owned lands).

Community Affairs was formed in 1987 to provide direct contact with local governments and others through the efforts of Governmental Affairs Coordinators (GACs) located in each District service office (Brooksville, Tampa, Bartow, Venice and Lecanto). Establishment of District service offices, including localized permitting functions (in all but the Lecanto office) and an assigned GAC in each, is intended to make District services more accessible. The department also furthers implementation coordination through:

- ❖ staffing the District's advisory committees (Public Supply, Green Industry, Industrial, Environmental and Agricultural), as well as monitoring the various committees, task forces and advisory councils of others;
- ❖ provision of liaison services to the State legislature;
- ❖ representing the District before national, state, county and city elected bodies and organizations; and
- ❖ coordinating the Cooperative Funding program.

By maintaining regular, consistent interaction with local governments, staff from Community Affairs help the District identify and resolve water management issues in a timely, coordinated fashion.

1-3.3 Planning

Planning is responsible for providing land and water resource planning, awareness and technical assistance to citizens and organizations within and outside the District. This includes long-range planning for the District, integrating water management activities with local growth management efforts, and statewide policy coordination.

The District has a comprehensive local government planning assistance program. This program is intended to assist communities in incorporating sound water management principles and the best available water resource information into all their planning efforts. This assistance deals with every aspect of water management, including water supply, flood protection, water quality management and natural systems management, as these issues are addressed by local governments in their plans.

The District Water Management Plan is intended to provide long-range guidance to local communities on the proposed actions and intentions of the District regarding water management within the 16-county area. A primary tool in this regard is the Integrated Plan. All SWFWMD integrated plans will be updated in coordination with local governments no later than November 1, 2000. These plans begin with a thorough review of the adopted local government comprehensive plan for each county (and its major cities), use information on key water management issues as identified by local staff and the public, and continue to serve as a coordinating tool for mutually beneficial action by the District and local governments. To be most effective, the major tenets of integrated plans should end up **back** in the local government

plan, as part of a coordinated strategy to achieve water management and protection.

Another avenue of coordination for SWFWMD is the five regional planning councils (RPCs) within the District (Tampa Bay, Withlacoochee, Southwest, Central Florida and East Central Florida). The essential role of the RPCs is to address multi-jurisdictional (i.e., regional) planning and development needs that would otherwise go unattended. District staff are solidly involved with all of these efforts, and the District has ex officio members on all the RPCs in the SWFWMD but the East-Central RPC, which has only a very small area in the District.

1-3.4 Resource Regulation

Resource Regulation provides a number of key intergovernmental linkages for the District. It coordinates with the other water management districts, both informally and through the Interdistrict Regulatory Group, which meets regularly. Examples of state and federal coordination include interaction with the Florida Department of Transportation (DOT) on surface water permitting and DOT drainage facilities; and work with the Department of Environmental Protection (DEP) and the United States Environmental Protection Agency (EPA) on deep well injection. Provision of technical information to the State's Department of Agriculture and Consumer Services on agricultural water use permitting has led to new regulatory streamlining approaches such as "Whole Farm Planning." Local government efforts include regulatory delegation programs, as well as close coordination with local environmental regulators like Hillsborough County's Environmental Protection Commission.

1-4 Resource-Specific Coordination

A number of current implementation efforts can best be classified as resource-specific, that is the cooperation and results involved revolve around a particular program or initiative of the District. Several of these are cited below.

1-4.1 Land Acquisition and Management

The District recognizes and has responded to the tenet that governmental agencies responsible for public land acquisition should work together to purchase lands jointly and to coordinate individual purchases within ecological systems. To that end, when evaluating lands for potential acquisition or acquiring lands, the District coordinates with appropriate governmental entities. A number of counties within the District, including Hernando, Hillsborough, Lake, Marion, Manatee, Pinellas, Polk and Sarasota have various funding mechanisms to acquire environmentally sensitive lands. The District has worked with many of these counties to cooperatively or jointly purchase lands.

The District has also worked closely with the Green Swamp Land Authority in effecting less-than-fee simple techniques through land protection agreements in Polk and Lake counties, and has entered into partnerships with the State to acquire lands. One recent example of the latter had the District and the State, through its Conservation and Recreation Lands program, jointly purchasing lands within the Jordan Ranch project. The Jordan Ranch and Myakka River (Myakka State Forest) lands are managed by the Florida Division of Forestry.

1-4.2 Surface Water Improvement and Management (SWIM) Projects

All priority water body management plans have specific activities addressing coordination with the appropriate local government(s). Mutual support and cost sharing are generally components of these initiatives. In some cases,

the impetus of District activity has generated other local water body improvement projects (often referred to as “son of SWIM” projects). Examples in Pinellas County include joint funding strategies for Lake Seminole and Lake Maggiore between the county and the Pinellas-Anclote Basin Board. More recently, work by District staff in coordination with the Lake Panasoffkee Restoration Council has yielded an action plan that will be actively supported by the District. The District’s SWIM Program also works closely with the National Estuary Program (NEP) efforts.

1-4.3 Emergency Management

The District participates in local government emergency operations exercises, and coordinates with local operations and stormwater departments, particularly during storm events with the potential for flooding. This coordination extends to the state and federal levels as well. For example, the District works closely with the Florida Department of Community Affairs (DCA) in their role as the State Emergency Operations Center, and with the National Hurricane Center to improve methods for flood forecasting and structure design and operation. The District is committed to improving this coordination through ongoing communication and clear definition of respective roles.

1-4.4 Aquatic Plant Management

The District does aquatic plant management on publicly accessible inter-county waters (e.g., on the Withlacoochee River) in cooperation with the DEP through the Cooperative Aquatic Plant Control Program. Local governments are required to provide matching funds to maintain access, navigation and natural system protection on intra-county waters under the same program. In addition, local funding is necessary to manage portions (residential canals) of public waters that are not eligible for State funding. Citrus, Hernando and Sumter counties contract with the District for this service.

1-4.5 Shared Data

Several local governments and other agencies such as DEP and the United State Geological Survey (USGS) collect streamflow and water quality information used by the District. For example, the city of Tampa is performing inflow studies of the lower Hillsborough River to address optimal withdrawals, while minimizing downstream impacts. Manatee County is monitoring the water quality of the Manatee River. The city of Punta Gorda is performing environmental studies at Shell Creek. DEP maintains the bi-annual 305B Report that details water quality trends in selected water bodies. An important consideration in any data sharing effort is assurance of quality control. The District typically relies on comprehensive Quality Assurance/Quality Control Plans, as in data collection done for DEP, to ensure consistent methodologies and standards.

All District data is also available to the public. Local governments are one of the primary groups to need and use the information collected by the District's various programs. Examples include the District's aerial mapping program, which provides detailed topographic maps that aid in the delineation of flood-prone area boundaries, drainage basins, and surface water management studies. Over 28,000 aerial mapping copies were distributed to governmental agencies, private firms and citizens during FY 1998.

Local communities also benefit indirectly from available District information. An example is the hydrologic and flood information collected by the District and provided to local emergency centers. The District also requests detailed information from local water utilities annually. These data are then compiled into a report describing the current and projected water use for each area in the SWFWMD, and then provided to these utilities and others. These data are crucial to accurate water use and land use planning by local governments and the District.

The District's stormwater research program includes interaction with other agencies and state universities to provide a coordinated research effort. The District is concentrating on specific areas of research, while others are investigating alternative aspects. Statewide stormwater workshops are sponsored by the SWFWMD as needed to exchange information.

1-4.6 Regional Water Supply Authorities (WSAs)

The District's Governing and Basin Boards have provided continuing support, in the form of staff assistance and funding, for the development of three regional entities, since their authorization in Chapter 373, F.S. Included are Tampa Bay Water (formerly the West Coast Regional Water Supply Authority; the oldest and most established of these authorities), the Peace River/Manasota Water Supply Authority (PR/MWSA), and the Withlacoochee River Water Supply Authority (WRWSA).

Recent examples of cooperative efforts include:

- ❖ The District and Tampa Bay Water signed the Tampa Bay Partnership Agreement in 1998, a far-reaching strategy to assure sustainable water supplies for nearly two million people, while reducing reliance on stressed groundwater sources.
- ❖ The District is helping to fund expansion of the PR/MRWSA Peace River facilities, including expanded aquifer storage and recovery facilities and regional interconnections.
- ❖ The Withlacoochee and Coastal Rivers basin boards have provided significant financial assistance toward the development of the WRWSA's first well field in Citrus County.
- ❖ A feasibility analysis for a fourth water supply authority that would encompass Polk, Highlands and Hardee counties is underway as of mid-1999.

The District makes a number of its properties available to water supply authorities for water supply development. For instance, the District's Starkey, Cypress Creek and Lower Hillsborough Flood Detention area land holdings are used by Tampa Bay Water as wellfield properties. Also, the District has acquired land in DeSoto County, portions of which are assisting the PR/MRWSA in developing additional water supplies from the Peace River.

1-4.7 Water Management Districts

Florida's District Water Management plans are examples of dedicated coordination among the state's water management districts. The five water management districts and the DEP have worked together to ensure consistency in each district's Plan, both in their development and continuing coordination of their evaluation and revision processes.

Another example of an activity coordinated among all the Districts statewide is the multi-media promotional effort to increase awareness of the need for water conservation. The districts also convene annual water management, and technical, conferences to exchange program information and discuss emerging issues, techniques and technologies.

Often federal or state funds will support a program that is split among the WMDs. The SWIM Program is one example of a cooperative effort between the DEP and the five water management districts, and the pursuit of water supply development funding from the federal government is another.

Chapter VII. Procedures for Plan Development

This section is intended to document the significant process utilized by the Southwest Florida Water Management District (SWFWMD or District) in the updating of this Plan. This process has incorporated coordination among all water management districts, the Department of Environmental Protection (DEP) and other state agencies, local and regional governments and other appropriate parties, as well as input from citizens, special interest groups and affected parties. This "external" effort is consistent with the District's ongoing approach of using input from all sectors of water use and management, and was intended to provide a mechanism to complement widespread staff and decision-maker involvement in the planning process.

Section 373.036 (2) (a), Florida Statutes (F.S.), notes that the "district water management plan...shall be developed and revised in cooperation with other agencies, regional water supply authorities, units of government, and interested parties..." This chapter details that interaction with brief sections on public participation and participation by governmental organizations, as well as providing definitions for terms commonly used in water management.

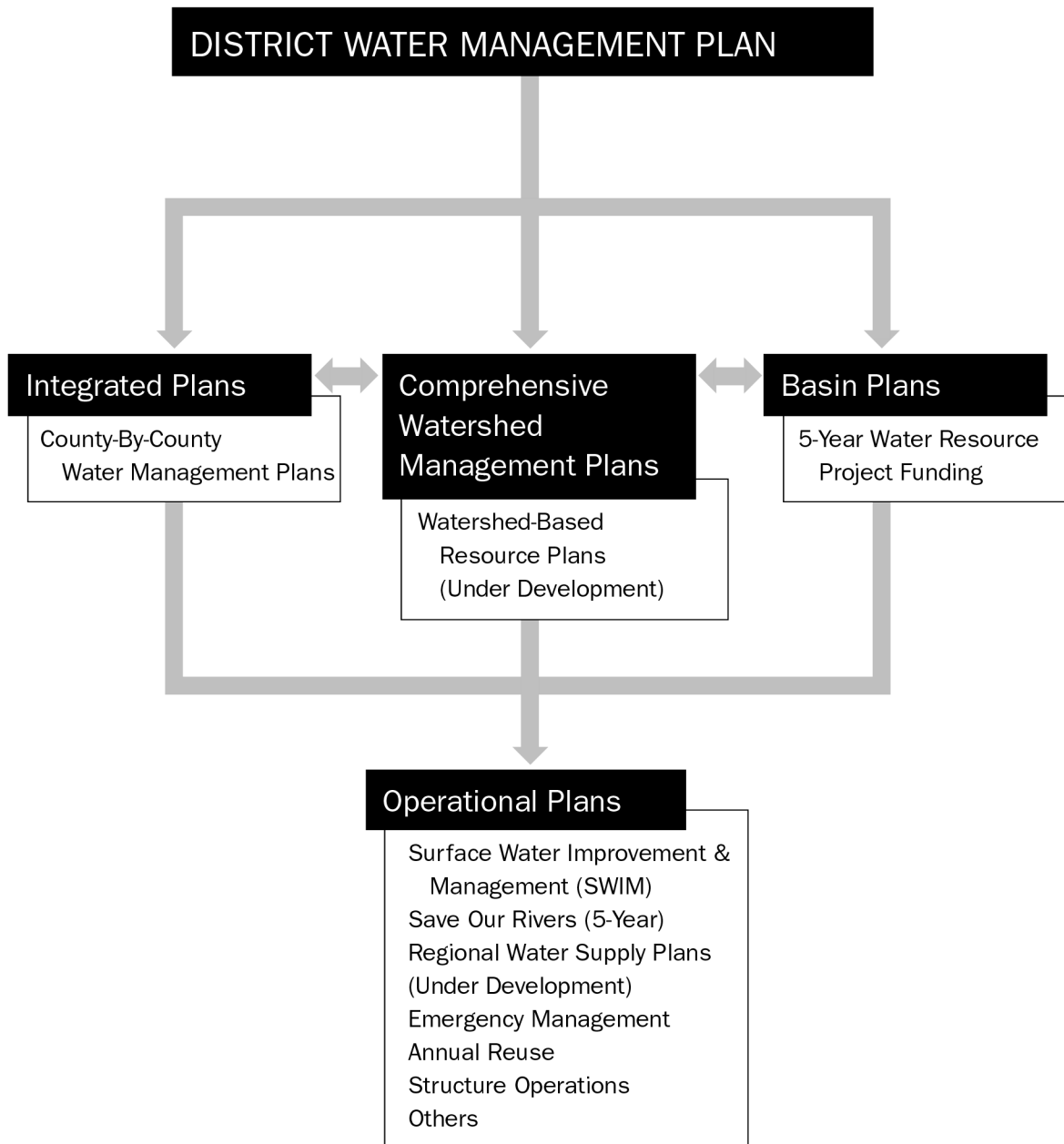
Water management planning at the District is best characterized as a continuous process or ongoing activity. This is typified by the strategic planning done through annual planning workshops of the Governing and Basin Boards, the Governing Board's Planning Committee that meets each month, five-year Basin plans that are updated annually and the emerging Comprehensive Watershed Management (CWM) plans, to name a few key examples. The relationship of all these planning efforts can be seen in Figure 34. In effect, this Plan serves as the overall umbrella, under which all our "operational plans" fall, incorporated by reference into the agency's comprehensive plan.

The key message here is that all the District's planning efforts are unified and each aspect of Figure 34 represents specific opportunities for public and governmental involvement in the District's management activities. For example, local governments are members of CWM teams, and receive District funding and technical assistance through Basin planning and cooperative funding. They are our partners in Surface Water Improvement and Management (SWIM) projects, emergency management activities and the development of alternative water supply sources. The District's integrated plans (scheduled to be updated no later than November 1, 2000) represent county-specific "mini-plans" and are collaboratively developed. All these mechanisms, and many more, make water resource planning a shared responsibility.

Citizens, too, are given many opportunities to participate – from open, well-noticed Board meetings, to serving on advisory committees and special purpose groups like the Southern Water Use Caution Area (SWUCA) Working Group. The District's Web Page offers interactive access to water management, with direct feedback to the scientific peer review process for establishing Tampa Bay minimum flows and levels (MFLs) as just one example. In effect, the interested citizen or interest group is limited only by their own desire to participate in water resource management.

Figure 34.

Southwest Florida Water Management District Plan Relationships



Source: SWFWMD, Planning Department
December 1999

Part A. Public Participation

The purpose of the Draft District Water Management Plan public input process was to facilitate open and ongoing communication between citizens and their water management district as a means of assuring that those affected by the District's actions will be fully involved in shaping its programs.

Certainly, the involved (or participating) citizen, group or agency is more likely to identify with and support the results of activities they have helped develop. An example of this in the SWFWMD is the creation and utilization of work groups in the District's Water Use Caution Areas (WUCAs). Most recently, the SWUCA Working Group is assisting in, and benefitting from, the opportunity to clearly define the roles of the many actors involved in the resolution of critical water supply problems. As a result, the varied types of affected water users, public supply utilities and the water management district know what is expected from them, and what they can expect from others.

Again, it is important to view public participation as continuous and ongoing at the District as it relates to the many plans and programs that make up water management. Specific elements of this Plan's update participation process have included:

- ❖ posting of the 1994 Plan's Executive Summary on the District's Web site continuously for several years;
- ❖ mailing of the "Plan Update 99 Call to Action" brochure to about 4,000 citizens, organizations, advisory committees and others with response options encompassing mail, phone and E-mail;
- ❖ input from the major standing advisory committees of the District (Agricultural, Public Supply, Industrial, Environmental and Green Industry) at both the pre-draft stage and following completion of the draft update;
- ❖ Governing Board public workshops in June, August, September, and October 1999, prior to the official acceptance of the Plan at the January, 2000 Board meeting;
- ❖ discussion at the Governing Board Planning Committee meetings on specific aspects of the draft Plan from May through September, 1999; and
- ❖ four sets of public input meetings throughout the District in September, 1999 (Sebring, Sarasota, Tampa and Lecanto).

This process is in addition to, and complements, specific participation opportunities by other governmental agencies (see next section). Seeking public input was essentially a continuous process throughout 1999, with specific periods of public comment on both the previously existing Plan and the updated draft of the Plan.

Part B. Participation By Other Governments

In addition to providing for participation by the public in the update process for this Plan, the District actively sought the input of local and regional governments and appropriate state agencies to identify key water management issues and needs through review and comment on the revised draft Plan. Coordination with the other water management districts and DEP in the preparation of the Plan (e.g., the DEP Interdistrict Work Group, refinement of a standardized Format and Guidelines, etc.) was one element of this strategy.

Continued close coordination with the State is essential, and is underway in the form of continuing District participation on the Florida Water Plan update (charged with evolving the statewide water management direction), regional water supply planning, watershed management development (including the Hillsborough River

Basin Watershed Management Plan) and many other efforts. Interaction with the other four water management districts is equally important to assure consistency and accountability, especially as it relates to boundary issue coordination, sound water policy, water resources education, regulatory coordination and related matters. State agencies that are provided the draft Plan update for review and comment included DEP, the Department of Community Affairs (DCA), the Department of Agriculture and Consumer Services (DACs), the Department of Transportation (DOT) and the Fish and Wildlife Conservation Commission (FWCC).

The Integrated Plan(s), to be developed subsequent to completion of this update, will reflect the significant and ongoing coordination with, and cooperation of, local governments in all 16 counties of the District. This effort will result in updated, individual stand-alone documents for each of these counties that are intended to be the basis for **continuous participation** between agencies. The ultimate purpose of Integrated plans is to facilitate and enhance coordination with local governments, address their particular water management needs and develop mutual strategies to resolve identified issues. In this manner, local governments and others will have access to the best available information of the District, while maintaining two-way communication in the best interest of water resources.

Presentations were also provided to each of the four primary regional planning councils (RPCs) in the District to solicit input and increase awareness of the process among the many local governments that make up the councils. In addition, advance notice of all public and local government meetings was provided to allow interaction of RPC members. The public meetings held throughout the District were set up to include specific meeting times that would facilitate local government involvement, as well as that of the general public. Copies of the draft

updated Plan were sent to all local governments in the District. Finally, the District had direct interaction with the three regional water supply authorities (Tampa Bay Water, Peace River/Manasota and Withlacoochee) in the SWFWMD to gain their input.

Part C. Definitions

100-YEAR FLOODPLAIN - Area inundated by a flood event which has a 1 in 100 probability of occurring in any given year.

298 DISTRICT - Special District created for drainage or flood control purposes pursuant to Chapter 298, F.S.

ABANDONED WELL - A well that is no longer being used or maintained, or which does not meet current construction standards.

AQUIFER - A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to yield useful quantities of ground water to wells and springs.

AQUIFER STORAGE AND RECOVERY - Storage of injected water in an acceptable aquifer when water is available for use at a later time. (In essence, use of the aquifer as a reservoir.)

AREA OF CRITICAL STATE CONCERN (ACSC) - Areas designated pursuant to Chapter 380.05, F.S. for the purpose of conserving and protecting key natural, economic and public resources.

ARTESIAN - A semi-confined or confined aquifer with enough pressure to raise water in a well above the top of that aquifer.

AUGMENTATION - The transfer of water from one source to another for the purpose of maintaining or raising the water level of a surface water body.

BEST MANAGEMENT PRACTICES (BMP)

- Structural or non-structural activities designed to reduce or eliminate pollutant loading to aquatic ecosystems.

BRACKISH - Waters whose saline content is intermediate between that of fresh water and salt water.

CHANNELIZATION - The alteration of a natural surface water conveyance to increase the volume and/or rate of discharge.

CLOSED DRAINAGE BASIN - An internally drained watershed in which the runoff does not have a surface outfall up to the 100-year level.

COASTAL WATERS - Waters of the Atlantic Ocean or the Gulf of Mexico within the jurisdiction of the state. (373.019(13), F.S.)

CONE OF DEPRESSION - The depression of the water table or potentiometric surface caused by pumping from a well, well field, or surface water body within its area of influence.

CONFINED AQUIFER - An intermediate or deep aquifer that has one or more impervious confining layers above it.

CONSUMPTIVE USE - Any use of water which reduces the supply from which it is withdrawn or diverted.

DESALINATION - The process of removing or reducing salts and other chemicals from seawater or highly mineralized water.

DETENTION - The delay of storm runoff prior to discharge into receiving waters.

DISCHARGE - The quantity of water that passes a given point in a given unit of time.

DRAINAGE BASIN - See Watershed.

ESTUARY - An aquatic ecosystem where water salinity is seasonally balanced by a mixture of fresh (river) and salt (sea) water. An important nursery for many juvenile finfish and shellfish species.

EVAPOTRANSPIRATION - The total loss of water to the atmosphere by evaporation from land and water surface and by transpiration from plants.

FISCAL YEAR (FY) - Fiscal Year for the District runs from October 1st through September 30th.

FLOODPLAIN - Land area subject to inundation by flood waters from a river, watercourse, lake, or coastal waters. Floodplains are delineated according to their estimated frequency of flooding.

FLOOD-PRONE - Land area subject to periodic inundation, whether or not adjacent to a water body. The term is used generally and is not intended to identify specific locations or return frequencies.

FLORIDA WATER PLAN - The State Water Use Plan, together with the water quality standards and water classifications adopted by the DEP.

GRAY WATER - The water component of wastewater that is generated by cooking, bathing, and laundry activities.

GROUND WATER - Water beneath the surface of the earth.

HEADWATER - The source of a river or stream.

HYDROLOGY - A science dealing with the properties, distribution, and circulation of water.

HYDROGEOLOGY - A science dealing with the relationship of subsurface water and geologic materials.

HYDROLOGIC CYCLE - The cycle through which water passes from the oceans through the atmosphere to the land and back to the oceans.

HYDROPERIOD - Period of time during which soils, water bodies and wetlands are saturated.

IMPERVIOUS - Land surfaces which do not allow, or minimally allow, the penetration of water; examples are buildings, non-porous concrete and asphalt pavements, and some fine-grained soils such as clays.

IMPOUNDMENT - Any lake, reservoir, pond, or other containment of surface water occupying a bed or depression in the Earth's surface and having a discernible shoreline.

ISOLATED WETLAND - Any wetland as defined pursuant to Chapter 40D-4, F.A.C., that is not within the Department of Environmental Protection's jurisdiction for purposes of regulating dredging and filling.

KARST - An area of irregular limestone in which erosion has produced fissures, sinkholes, underground streams, and caverns.

LITTORAL - Of, relating to, or existing on a shore. A shore or coastal region. Also, found in the shores of a wet detention system.

MITIGATION - A designed reduction or elimination of adverse environmental impacts.

MONITOR WELL - A well used to monitor hydrologic data, such as water levels or water quality parameters. [40D-3.021(20)]

NON-POINT SOURCE POLLUTION - The introduction of harmful elements from land into aquatic ecosystems, from such sources as urban and agricultural runoff, on-site waste disposal systems, atmospheric deposition, etc.

OPEN DRAINAGE BASIN - A watershed having a surface outfall.

OVERDRAFT - Groundwater withdrawal in excess of the amount that can be withdrawn from a groundwater basin annually without producing an undesired result.

PERCOLATION - To seep or drain through a porous substance or filter.

PERMEABILITY - Capacity for transmitting a fluid, measured by the rate at which a fluid of standard viscosity can move a given distance through a given interval of time.

PERVIOUS SURFACE - A surface material through which water seeps, drains, or collects.

POINT SOURCE POLLUTION - The introduction of harmful elements from land into aquatic ecosystems, from specific "end-of-pipe" sources such as waste disposal facilities, landfills, industrial facilities, etc.

POLLUTANT LOAD REDUCTION GOAL (PLRG) - The mean 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.

POTABLE WATER - Drinking water. Water whose chemical constituents do not exceed the limits set forth in state water quality standards.

POTENTIOMETRIC SURFACE - A surface which represents the pressure head in a confined aquifer and is defined by the levels to which water will rise in a well in the confined aquifer, that fully penetrates the aquifer.

REASONABLE-BENEFICIAL USE - The use of water in such quantity as is necessary for economic and efficient utilization for a purpose and in a manner which is both reasonable and consistent with the public interest. [F.S. Chapter 373.019(4)]

RECHARGE - The replenishment of ground water through the infiltration of rainfall and other surface waters.

RECHARGE AREA - An area that, due to its pervious ground cover, karst topography, or permeability, contributes to a state of recharge.

RECLAIMED WATER - Water that has received at least secondary treatment and is reused after flowing out of a wastewater treatment facility.

RETENTION - The prevention of direct discharge of storm runoff into receiving waters; included as examples are systems that discharge through percolation, exfiltration, and evaporation processes and that generally have residence times less than three days.

REUSE - The application of reclaimed water, in compliance with DEP rules, for a beneficial purpose.

RUNOFF - Surface water (usually rainfall) that is not evaporated, transpired, used, or absorbed into the groundwater system, and thus flows to a surface water body.

SAFE YIELD - The amount of water that can be withdrawn from a groundwater system without producing unacceptable impacts.

SALINE WATER - An aqueous solution with a total dissolved solids concentration greater than 500 mg/L and less than that of seawater.

SALTWATER INTERFACE - The series of points along a freshwater aquifer where the hydrostatic pressure of that aquifer and intruding salt water is equal.

SALTWATER INTRUSION - The phenomenon which occurs when saline water moves laterally inland from the seacoast or vertically to replace fresher water in an aquifer or surface water body.

SEDIMENT - Finely divided solid material that settles beneath the surface of water.

SINKHOLE - A depression in the land surface formed either by collapse of the roof of an underground cavern or channel or by solution of near-surface limestones or similar rocks.

SPECIAL DISTRICT - A governmental or quasi-governmental entity formed for the purpose of providing one or more services to a specific geographic area.

STATE WATER RESOURCE IMPLEMENTATION RULE (Chapter 62-40 Florida Administrative Code) - A comprehensive statewide rule that sets forth goals, objectives, and guidance for water resource management. (373.019(16), F.S.)

STORM SURGE - Coastal inundation caused by a combination of high tides and onshore winds associated with a major storm event.

STORM WATER - Water that results from a rainfall event.

STORMWATER UTILITY - A local government financing mechanism providing a dedicated funding source for surface water management.

SURFACE WATER - Water upon the surface of the Earth, whether contained in bounds created naturally or artificially or diffused. Water from natural springs shall be classified as surface water when it exits from the spring onto the Earth's surface. (373.019 (10), F.S.)

SURFACE WATER MANAGEMENT SYSTEM - The collection of facilities, improvements, or natural systems whereby surface waters are collected, controlled, conveyed, impounded, or obstructed. The term includes dams, impoundments, reservoirs, appurtenant works and works as defined in Subsections 373.403(1)-(5), F.S. [40D.4.021(5)]

TOTAL MAXIMUM DAILY LOADS (TMDLs) - The maximum amount of pollution that a waterbody can assimilate without violating State water quality standards.

UNCONFINED AQUIFER - A surficial aquifer that does not have an impervious confining layer above it.

UPCONING - Upward migration of mineralized water as a result of pressure variation caused by withdrawals.

WATER MANAGEMENT STRUCTURE - A structure placed on a lake, reservoir, river or stream, that regulates either the flow or water level.

WATER RESOURCE DEVELOPMENT - The formulation and implementation of regional water resource management strategies, including the collection and evaluation of surface water and groundwater data; structural and nonstructural programs to protect and manage water resources; the development of regional water resource implementation programs; the construction, operation, and maintenance of major public works facilities to provide for flood control, surface and underground water storage, and groundwater recharge augmentation; and related technical assistance to local governments and to government-owned and privately owned water utilities.

WATERS OF THE STATE - Any and all water on or beneath the surface of the ground or in the atmosphere, including natural or artificial watercourses, lakes, ponds, or diffused surface water and water percolating, standing, or flowing beneath the surface of the ground, as well as all coastal waters within the jurisdiction of the state. (373.019(8), F.S.)

WATERSHED - A watershed (or surface water drainage basin) is the geographic area from which water in a particular stream, lake or estuary originates. All lands in the watershed drain toward the stream, lake or bay.

WATER TABLE - The surface of a body of unconfined ground water at which the pressure is equal to that of the atmosphere; defined by the level where water within an unconfined aquifer stands in a well.

WELL - An artificial hole in the ground from which water supplies may be obtained.

WELL FIELD - Multiple wells under common ownership or control, which may or may not be located on contiguous land parcels, intended to supply a common service area. Term usually associated with public water supply.

XERISCAPE™ - A type of quality landscaping that conserves water and protects the environment by using site appropriate plants, an efficient watering system, proper planning and design, soil analysis, practical use of turf, the use of mulches (which may include the use of solid waste compost) and proper maintenance. [40D-24.010(1)(b)]

Part D. Evaluation Procedures

Recognition that the planning process is an iterative process is crucial to the success of any long-range plan. At regular intervals, the plan must be evaluated. One component of this evaluation should be a critical examination of how well the plan is working to achieve desired goals. If done accurately, this examination can result in a clear indication of what, if any, modifications are needed in the plan to ensure that long-term goals are realized.

The need to evaluate the District Water Management Plan is explicitly acknowledged in "State Water Resource Implementation Rule" (Chapter 62-40, F.A.C.). This rule requires that the Plan include provisions for it to be updated and progress toward realizing desired goals be assessed every five years following initial Plan development. This appraisal is done in the context of a comprehensive update of the Plan, now statutorily required at least every five years.

In addition to this five-year appraisal, Chapter 62-40 requires an annual evaluation of the District's progress towards implementing the Plan.

The following section outlines the "Annual Report," intended to be an activity-based measure of whether the District is complying with the schedules, programs and activities described in the Plan.

Section 1. Annual Report

The District will prepare an assessment of its progress toward implementation of the Plan on an annual basis. This assessment will focus on the District's compliance with the schedules, programs, and activities described in the Plan; that is, the "Annual Report" will be an "activity-based" report indicating the District's compliance with the commitments made.

The "Annual Report" will be submitted to the Governing Board of the District in October of each year and subsequently transmitted to the Florida Department of Environmental Protection as a means of informing them of the progress being made toward complying with the Plan. Transmittal of this report to the DEP must occur no later than November 15 of each year. Copies of the "Annual Report" will also be made available to regional planning councils, local governments (both counties and cities), and members of the public to keep them informed regarding the District's progress toward meeting the schedules, programs, and activities described in the Plan.

The "Annual Report" is intended to serve as a status report on the activities being undertaken by the District. It is not intended to measure the overall success, or effectiveness, of these activities toward achieving the goals established in the Plan. That is the role of the performance or effectiveness measures described earlier in this Plan.
