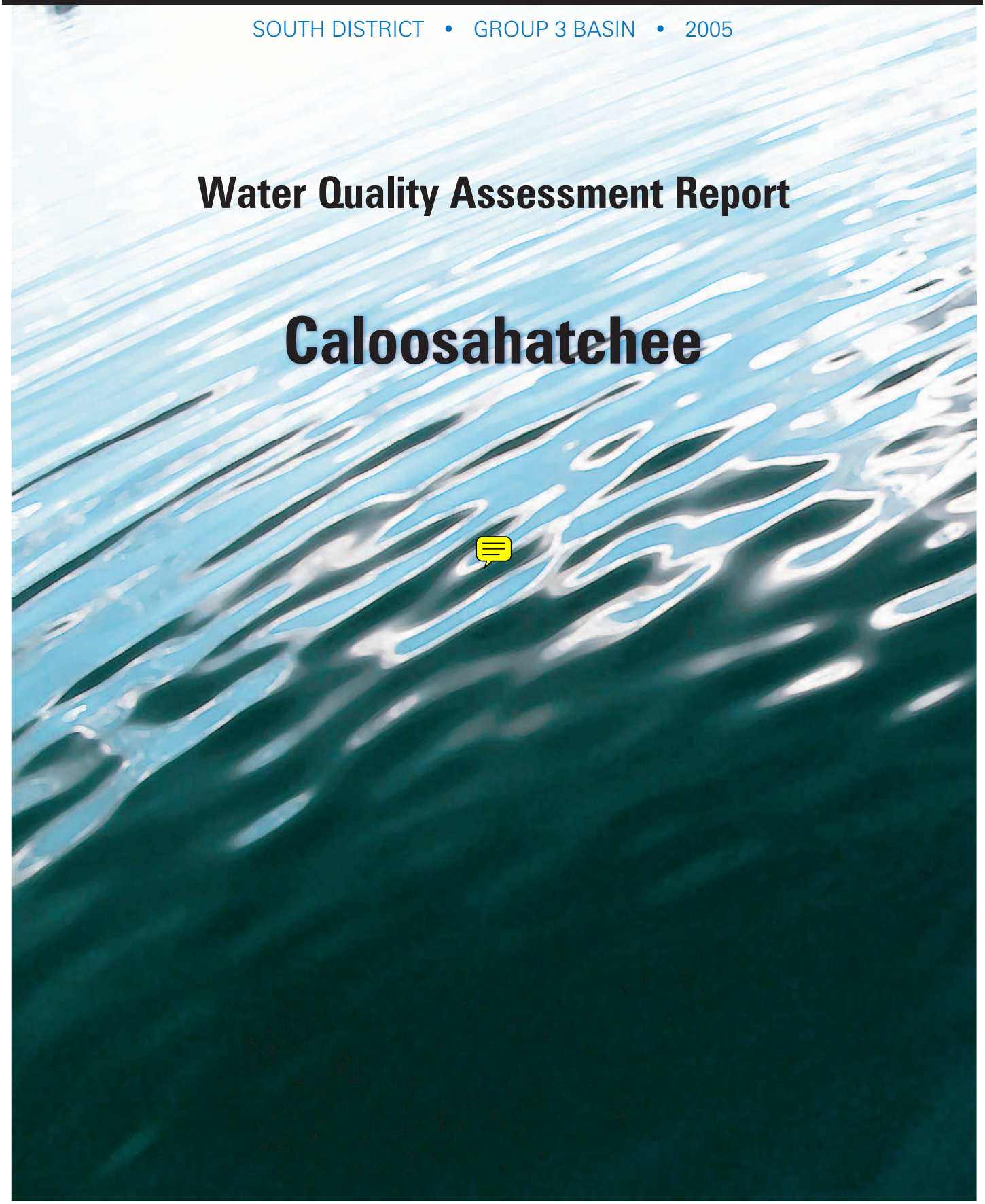
FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Resource Management

SOUTH DISTRICT • GROUP 3 BASIN • 2005

Water Quality Assessment Report

Caloosahatchee



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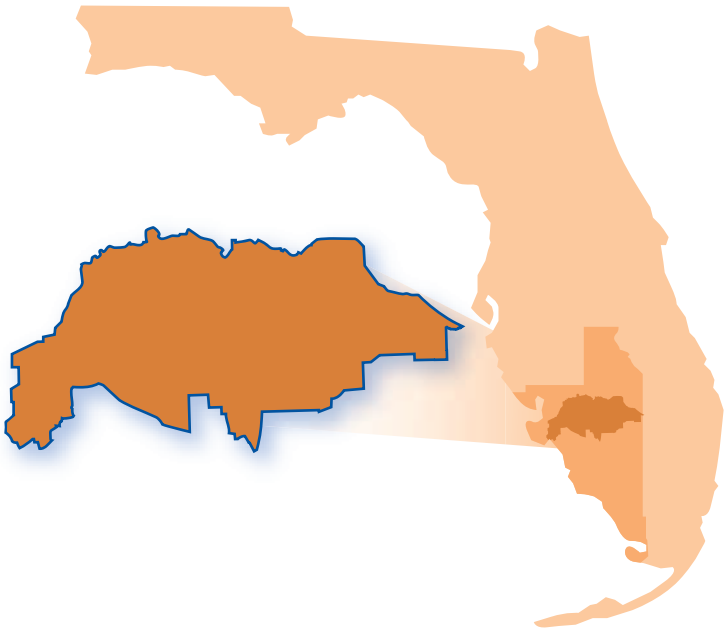

Acknowledgments

The *Caloosahatchee Water Quality Assessment Report* was prepared by the Caloosahatchee Basin Team, Florida Department of Environmental Protection, as part of a five-year cycle to restore and protect Florida's water quality. Team members include the following:

Pat Fricano, Basin Coordinator
T. S. Wu, Ph.D., P.E., Assessment Coordinator
Gordon Romeis, South District
Karen Bickford, South District
Robert Perlowski, Watershed Assessment Section
Dave Tyler, Watershed Assessment Section
Ron Hughes, GIS
James Dobson, Groundwater Section
Janet Klemm, Water Quality Standards and OFWs

Editorial and writing assistance provided by
Linda Lord, Watershed Planning and Coordination

Production assistance provided by
Center for Information, Training, and Evaluation Services
Florida State University
210 Sliger Building
2035 E. Dirac Dr.
Tallahassee, FL 32306-2800

Map production assistance provided by
Florida Resources and Environmental Analysis Center
Florida State University
University Center, C2200
Tallahassee, FL 32306-2641

For additional information on the watershed management approach and impaired waters in the Caloosahatchee Basin, contact

Pat Fricano
Florida Department of Environmental Protection
Bureau of Watershed Management, Watershed Planning and Coordination Section
2600 Blair Stone Road, Mail Station 3565
Tallahassee, FL 32399-2400
pat.fricano@dep.state.fl.us
Phone: (850) 245-8559; SunCom: 205-8559
Fax: (850) 245-8434

Access to all data used in the development of this report can be obtained by contacting

T.S. Wu
Florida Department of Environmental Protection
Bureau of Watershed Management, Watershed Assessment Section
2600 Blair Stone Road, Mail Station 3555
Tallahassee, FL 32399-2400
tien-shuenn.wu@dep.state.fl.us
Phone: (850) 245-8457; SunCom: 205-8457
Fax: (850) 245-8536

Web Sites

Florida Department of Environmental Protection, Bureau of Watershed Management

TMDL Program
http://www.dep.state.fl.us/water/tmdl/index.htm

Identification of Impaired Surface Waters Rule
http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf

STORET Program
http://www.dep.state.fl.us/water/storet/index.htm

2004 305(b) Report
http://www.dep.state.fl.us/water/docs/2004_Integrated_Report.pdf

Criteria for Surface Water Quality Classifications
http://www.dep.state.fl.us/legal/rules/shared/62-302t.pdf

Status Reports
http://www.dep.state.fl.us/water/tmdl/stat_rep.htm

Allocation Technical Advisory Committee (ATAC) Report
http://www.dep.state.fl.us/water/tmdl/docs/Allocation.pdf

U.S. Environmental Protection Agency

Region 4: Total Maximum Daily Loads in Florida
http://www.epa.gov/region4/water/tmdl/florida/

National STORET Program
http://www.epa.gov/storet/

Preface

Content Features

- **Executive Summary:** Appears at the beginning of every report and provides an overview of the watershed management, its implementation, and how this approach will be used to identify impaired waters.
- **Sidebar:** Appears throughout the report and provides additional information pertinent to the text on that page.
- **Noteworthy:** Appears on pages near text that needs additional information but is too lengthy to fit in a sidebar.
- **Definitions:** Appear where scientific terms occur that may not be familiar to all readers. The word being defined is bold-faced in the text.
- **References:** Appear at the end of Chapter 5 and provide a complete listing of all sources used in the text.
- **Appendices:** Appear at the end of the report and provide additional information on a range of subjects such as bioassessment methodology, rainfall and stream flow, types of natural communities, STORET stations, water quality statistics, land use, and permitted facilities.

Executive Summary

Caloosahatchee

The Water Quality Assessment Report for the Caloosahatchee Basin is part of the implementation of the Florida Department of Environmental Protection's (Department) watershed management approach for restoring and protecting water resources and addressing Total Maximum Daily Load (TMDL) Program requirements. A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and still meet the waterbody's designated uses. A waterbody that does not meet its designated uses is defined as impaired. The watershed approach, which is implemented using a cyclical management process, provides a framework for implementing the requirements of the 1972 federal Clean Water Act and the 1999 Florida Watershed Restoration Act (Chapter 99-223, Laws of Florida).

A Status Report, published during Phase 1 of the watershed management cycle, provided a *Planning List,* or preliminary identification, of potentially impaired waterbodies in the Caloosahatchee Basin. This Assessment Report presents the results of additional data gathered during Phase 2 of the cycle. The report contains a *Verified List* of impaired waters (**Table 4.2** in Chapter 4) that has been adopted by Secretarial Order and approved by the U.S. Environmental Protection Agency (EPA). TMDLs must be developed and implemented for these waters, unless the impairment is documented to be a naturally occurring condition that cannot be abated by a TMDL, or unless a management plan already in place is expected to correct the problem. The Verified List also constitutes the Group 3 basin-specific 303(d) list of impaired waters, so called because it is required under Section 303(d) of the Clean Water Act. See **Noteworthy** in Chapter 1 for a description of the contents of this report, by chapter.

In the Caloosahatchee Basin, state, federal, regional, and local agencies and organizations are making progress towards identifying problems and improving water quality. Through its watershed management activities, the Department works with these entities to support programs that are improving water quality and restoring and protecting ecological resources. The Department's TMDL Program objectives will be carried out in the basin through close coordination with key stakeholders and initiatives such as Charlotte, Glades, Hendry, and Lee Counties; the cities of Fort Myers, North Fort Myers, Cape Coral, LaBelle, Moore Haven, and Clewiston; South Florida Water Management District (SFWMD); Charlotte Harbor National Estuary Program's (CHNEP) membership and the Comprehensive Conservation and Management Plan developed for the estuary; U.S. Army Corps of Engineers (USACOE); Southwest Florida Watershed Council; Caloosahatchee Water Management Plan; and Comprehensive Everglades Restoration Plan.

Not only do stakeholders in the basin share responsibilities in achieving water quality improvement objectives, they also play a crucial role in providing the Department with important monitoring data and information on management activities. Data providers in the basin include Charlotte and Lee Counties; the cities of Fort Myers, North Fort Myers, and Cape Coral; SFWMD; Southwest Florida Water Management District; U.S. Geological Survey; Florida Department of Health; and USACOE.

During the next few years, considerable data analysis will be done to establish TMDLs for impaired waters in the Caloosahatchee Basin, establish the initial allocations of pollutant load reductions needed to meet those TMDLs, and produce a Basin Management Action Plan, to reduce the amount of pollutants that cause impairments. These activities depend heavily on the active participation of the water management district, local governments, businesses, and other stakeholders. The Department will work with these organizations and individuals to undertake or continue reductions in the discharge of pollutants and achieve the established TMDLs for impaired waterbodies.

Summary of Findings

The Department's assessment shows that 22 waterbodies or waterbody segments in the Caloosahatchee Basin are impaired and require the development of TMDLs. The following summarizes, by planning unit, impairments by waterbody types and the primary pollutants. Planning units are smaller areas in the basin that provide a more detailed geographic basis for identifying and assessing water quality improvement activities.

East Caloosahatchee Planning Unit

Of the five waterbody segments in the East Caloosahatchee Planning Unit, all of them have sufficient data for assessment and all are verified impaired for at least one parameter.

The verified impaired parameters of the five waterbody segments in the planning unit, and parameters of impairment, are as follows:

East Caloosahatchee (waterbody identification number [WBID] 3237A)	Iron
Long Hammock Creek (WBID 3237B)	Nutrients (chlorophyll *a),* dissolved oxygen (DO)
Lake Hipcochee (WBID 3237C)	Lead, total coliforms
Ninemile Canal (WBID 3237D)	Fecal coliforms, lead
C-21 (WBID 3246)	DO, iron

West Caloosahatchee Planning Unit

Of the 14 waterbody segments in the West Caloosahatchee Planning Unit, all have sufficient data for assessment. Of these, 3 are verified impaired for at least 1 parameter assessed, 8 remain on the Planning List, and 3 meet standards.

The three verified impaired segments in the planning unit, and the parameters of impairment, are as follows:

West Caloosahatchee (WBID 3235A)	Iron, lead
Jacks Branch (WBID 3235D)	Nutrients (chlorophyll *a*)
Townsend Canal (WBID 3235K)	Copper, lead

Telegraph Swamp Planning Unit

Of the two waterbody segments in the Telegraph Swamp Planning Unit, only one (Telegraph Creek) has sufficient data for assessment. Telegraph Creek meets standards for all parameters with sufficient data to assess. There are no potential impairments in the planning unit.

Orange River Planning Unit

Of the two waterbody segments in the Orange River Planning Unit, both segments have sufficient data for assessment. Of these, Billy Creek is verified impaired for at least one parameter assessed, and Orange River meets standards.

The verified impaired parameter for Billy Creek is as follows:

Billy Creek (WBID 3240J)	Fecal coliforms

Caloosahatchee Estuary Planning Unit

Of the 13 waterbody segments in the Caloosahatchee Estuary Planning Unit, all segments have sufficient data for assessment and are verified impaired for at least 1 parameter assessed.

The 13 verified impaired segments in the planning unit, and the parameters of impairment, are as follows:

Tidal Caloosahatchee (WBID 3240A)	Fecal coliforms, DO, nutrients (chlorophyll *a*), copper
Tidal Caloosahatchee (WBID 3240B)	Fecal coliforms, DO, nutrients (chlorophyll *a*)
Tidal Caloosahatchee (WBID 3240C)	Fecal coliforms, DO, nutrients (chlorophyll *a*)
Yellow Fever Creek (WBID 3240E)	Fecal coliforms
Hancock Creek (WBID 3240E1)	Fecal coliforms, DO, nutrients (chlorophyll *a*)
Daughtrey Creek (WBID 3240F)	Fecal coliforms
Trout Creek (WBID 3240G)	Fecal coliforms, conductance
Whisky Creek (Wyoua Creek) (WBID 3240H)	Fecal coliforms
Manuel Branch (WBID 3240I)	Biology, copper, fecal coliforms, total coliforms, lead

Gilchrest Drain-Powel (WBID 3240L)	Fecal coliforms, DO, nutrients (chlorophyll *a*)
Stroud Creek (WBID 3240M)	Fecal coliforms, nutrients (chlorophyll *a*)
Owl Creek (WBID 3240N)	Fecal coliforms
Popash Creek (WBID 3240Q)	Fecal coliforms, DO, nutrients (chlorophyll *a*)

Total Maximum Daily Load Priority Areas

There is one high-priority area for TMDL development in the Caloosahatchee Basin. Section 62-303.500, Florida Administrative Code, defines high-priority waters as waterbody segments where the impairment poses a threat to potable water supplies or human health; waterbody segments where the impairment is due to a pollutant regulated by the Clean Water Act and the pollutant has contributed to the decline or extirpation of a federally listed threatened or endangered species, as indicated in the Federal Register listing the species; or waterbody segments verified as impaired that are included on the EPA's 1998 303(d) list as high priority.

The waterbody segment identified as a high-priority area for TMDL development is Ninemile Canal (WBID 3237D), which is on the 1998 303(d) list, and is verified impaired for fecal coliforms. All of the remaining parameters causing impairment for the WBIDs placed on the Verified List have been assigned medium priority for TMDL development.

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Chapter 1: Introduction

Purposes and Content of the Assessment Report

The Florida Department of Environmental Protection (Department) is implementing a statewide watershed management approach for restoring and protecting water quality and addressing **Total Maximum Daily Load** (TMDL) Program requirements. Under Section 303(d) of the 1972 federal Clean Water Act and the 1999 Florida Watershed Restoration Act (FWRA) (Chapter 99-223, Laws of Florida), TMDLs must be developed for all waters that do not meet their designated uses (such as drinking water, recreation, and shellfish harvesting) and are thus defined as impaired. TMDLs will be developed, and the corresponding reductions in pollutant loads allocated, as part of the watershed management approach, which rotates through the state's 52 river basins over a 5-year cycle. Extensive public participation from diverse stakeholders in each of these basins is crucial in all phases of the cycle.

Total Maximum Daily Load

The maximum amount of a given pollutant that a waterbody can assimilate and remain healthy, such that all of its designated uses are met.

A Status Report published during Phase 1 of the watershed management cycle provided a *Planning List,* or preliminary identification, of potentially impaired waterbodies in the Caloosahatchee Basin. A copy of the report can be found at http://www.dep.state.fl.us/water/tmdl/stat_rep.htm.

This Assessment Report, which updates the information in the Status Report, incorporates data collected from the Department's strategic monitoring and gathered from other agencies and groups during Phase 2 of the watershed cycle. The report contains a *Verified List* of impaired waters required by the FWRA and Section 303(d) of the federal Clean Water Act, for which TMDLs must be developed and implemented (see **Noteworthy** for a description of the Assessment Report's contents, by chapter). Based on the assessment results, in the Caloosahatchee Basin 22 waterbodies or waterbody segments are verified impaired for one or more parameters. TMDLs must be developed for these waters, unless the impairment is documented to be a naturally occurring condition that a TMDL cannot abate, or unless a management plan is already in place to correct the problem.

This report is intended for distribution to a broad range of potential stakeholders, including decision makers in federal, state, regional, tribal, and local governments; public and private interests; and citizens.

The Verified List is required by Subsection 403.067(40), Florida Statutes, and Section 303(d) of the federal Clean Water Act. The Department has adopted the Verified List of impaired waters in accordance with the FWRA and the Identification of Impaired Surface Waters Rule (Rule 62-303, Florida Administrative Code). The U.S. Environmental Protection Agency (EPA) has also approved this list as the current 303(d) list

of impaired waters for the basin, so called because it is required under Section 303(d) of the Clean Water Act.

The first 303(d) list, which was required by the EPA in 1998, is to be amended annually to include basin updates. Florida's 1998 303(d) list included a number of waterbodies in the Caloosahatchee Basin.

This Assessment Report follows the EPA's guidance for meshing Clean Water Act requirements for Section 305(b) water quality reports and Section 303(d) lists of impaired waters. The integrated water quality assessment is used to identify the status of data sufficiency, the potential for impairment, and the need for TMDL development for each waterbody or waterbody segment in the basin. **Tables 3.5 through 3.9** in Chapter 3 provide an integrated assessment for the Caloosahatchee Basin, by planning unit.

Appendix A describes the legislative and regulatory background for TMDL development and implementation through the watershed management approach, and briefly explains the TMDL Program. Background information on the Department's TMDL Program, the process of TMDL development and implementation, lists of impaired and potentially impaired waters, and assessments for other parts of the state are available at http://www.dep.state.fl.us/water/tmdl/index.htm.

Stakeholder Involvement

The FWRA requires the Department to work closely with stakeholders to develop and implement TMDLs. In addition, the Department's Allocation Technical Advisory Committee (ATAC) report, submitted to the legislature, recommends relying on stakeholder involvement. Stakeholder involvement in the TMDL process will vary with each phase of implementation to achieve different purposes **(Table 1.1)**. A copy of the ATAC report is available at http://www.dep.state.fl.us/water/tmdl/docs/Allocation.pdf.

The Department will work cooperatively with a number of key stakeholders and initiatives to develop, allocate, and implement TMDLs in the Caloosahatchee Basin. These include Charlotte, Glades, Hendry, and Lee Counties; the cities of Fort Myers, North Fort Myers, Cape Coral, LaBelle, and Moore Haven; South Florida Water Management District; Charlotte Harbor National Estuary Program; U.S. Army Corps of Engineers; Southwest Florida Watershed Council; and Comprehensive Everglades Restoration Program.

Table 1.1: Stakeholder Involvement in the TMDL Program

Watershed Management Cycle	Nature of Stakeholder Involvement
Phase 1: Preliminary Evaluation	Close coordination with local stakeholders to conduct a preliminary basin water quality assessment; inventory existing and proposed management activities; identify management objectives and issues of concern; develop a Strategic Monitoring Plan; and produce a preliminary Status Report that includes a Planning List of potentially impaired waters
Phase 2: Strategic Monitoring and Assessment	Cooperative efforts between the Department and local stakeholders to collect additional data; get data into STORET (the EPA's national water quality **STO**rage and **RET**rieval database); complete water quality assessment; produce a final Assessment Report that includes a Verified List of impaired waters for Secretarial adoption; and provide an opportunity for stakeholders to document reasonable assurance (for Department review) that existing or proposed management plans and projects are adequate to restore water quality without the establishment of a TMDL
Phase 3: Development and Adoption of TMDLs	Coordination with stakeholders to discuss TMDL model framework, including model requirements, parameters to be modeled, model endpoints, design run scenarios, and preliminary allocations; communication of science used in the process; public workshops for rule adoption of TMDLs
Phase 4: Development of Basin Management Action Plan	Broad stakeholder participation in developing a Basin Management Action Plan (B-MAP) (including detailed allocations and implementation strategies), incorporating it into existing management plans where feasible; public meetings during the planning process
Phase 5: Implementation of Basin Management Action Plan	Emphasis on implementing the B-MAP, other voluntary stakeholder actions, and local watershed management structures; Department will continue to provide technical assistance, fulfill oversight responsibilities, and administer National Pollutant Discharge Elimination System point and nonpoint source permits

The Watershed Management Cycle in the Florida Department of Environmental Protection's South District

Figure 1.1 shows the order in which the Department's South District basins will be evaluated under the watershed management cycle. These groups are identified according to a U.S. Geological Survey (USGS) classification system using hydrologic unit codes.

Everglades West Coast, a Group 1 basin, was the first basin in the district to undergo a preliminary assessment in 2000. A preliminary assessment for the Group 2 basin, Charlotte Harbor, was completed in 2001. The Group 3 basin, Caloosahatchee, was assessed on a preliminary basis in 2002. Similarly, a preliminary assessment for the Group 4 basin, Fisheating Creek, was initiated in 2003, and the Group 5 preliminary assessment for the Florida Keys Basin was begun in 2004. In 2005, the cycle resumes with the Group 1 basin, Everglades West Coast.

Figure 1.1: Schedule for Implementing the Watershed Management Cycle in the Department's South District, Basin Groups 1 through 5

Noteworthy

Contents of This Report

- **Chapter 1: Introduction** briefly characterizes the purpose and content of the Water Quality Assessment Report, discusses stakeholder involvement, and describes how the watershed management cycle will be implemented in the Department's South District.
- **Chapter 2: Basin Overview** characterizes the basin's general setting, water resources, major water quality trends, and watershed management issues and activities.
- **Chapter 3: Surface Water Quality Assessment** discusses the scope of the assessment, summarizes data-gathering activities and sources of data, describes the EPA's terminology for designated use attainment and its integrated report categories, and provides, by basin planning unit, an evaluation of water quality, a discussion of permitted discharges and land uses, a summary of ecological priorities and problems, and an overview of water quality improvement plans and projects.
- **Chapter 4: The Verified List of Impaired Waters** contains the Verified List of impaired waters, discusses public participation, describes documentation of reasonable assurance, lists the pollutants causing impairments, provides listings based on other information indicating a nutrient imbalance, and describes the adoption process for the Verified List.
- **Chapter 5: TMDL Development, Allocation, and Implementation** discusses the prioritization of listed waters, TMDL development, TMDL allocation and implementation, and the development of a Basin Management Action Plan.

Chapter 2: Basin Overview

Basin Setting

The Caloosahatchee River and Basin, in southwest Florida, stretch 70 miles westward from the western edge of Lake Okeechobee to San Carlos Bay, encompassing portions of 4 counties **(Figure 2.1)**. The watershed includes the East, West, and Estuarine Caloosahatchee drainage basins, as well as the Telegraph Swamp and Orange River drainage basins. The basin is home to 1 national wildlife refuge, parts of 2 state aquatic preserves, and 1 wildlife management area. (See sidebar for the sources of information used in this chapter.)

The Caloosahatchee River was originally a shallow, meandering river with headwaters in the proximity of Lake Hicpochee. The terrestrial, freshwater, and estuarine components of the Caloosahatchee system once supported an abundance of flora and fauna. The natural watershed sustained diverse plant communities, including pine flatwoods and saw palmetto prairies, sand pine and **xerophytic** oak, hardwood swamp forests, prairie grasslands, mangrove swamps, and coastal marshes (Kimes and Crocker, 1998). **Appendix B** briefly describes the basin's ecoregions and provides a list of remaining major natural communities.

Xerophytic
Adapted to a dry environment.

To accommodate navigation, flood control, and land reclamation needs, the freshwater portion of the river was reconfigured into a canal known as C-43. Many canals were constructed along the banks of the river in support of the agricultural communities along the river. Today, discharge structures and locks control the flow of the Caloosahatchee River from Lake Okeechobee to the Gulf of Mexico. Franklin Lock (S-79), in Lee County, separates the fresh water of the Caloosahatchee River from the salt water of the estuary.

The estuary, which is flanked by the cities of Cape Coral and Fort Myers, still provides critical wildlife habitat that requires careful management. In 1995, the tidal Caloosahatchee River (as part of the Charlotte Harbor system) was recognized as an "estuary of national significance" and was accepted into the National Estuary Program, forming the Charlotte Harbor National Estuary Program (CHNEP). The area encompassed by CHNEP does not include the nontidal portions of the Caloosahatchee River watershed between Franklin Lock and Lake Okeechobee, but this report does.

The Caloosahatchee River makes up part of the Okeechobee Waterway, linking the Gulf of Mexico to the Atlantic Ocean through Lake Okeechobee and the St. Lucie Canal and River. Agribusiness has converted many uplands and wetlands in the Caloosahatchee Basin to intensive agricultural uses. The river is the major source of surface water supply for

Sources of Information
Much of the information about the Caloosahatchee Basin in this chapter was obtained from The Caloosahatchee River and Its Watershed *(Kimes and Crocker, 1998),* The Caloosahatchee Water Management Plan *(South Florida Water Management District [SFWMD], 2000a),* The Comprehensive Conservation Management Plan for the Greater Charlotte Harbor Watershed, Volumes 1 and 2 *(Charlotte Harbor National Estuary Program [CHNEP], 2000a, 2000b), and* The Story of the Greater Charlotte Harbor Watershed *(Estevez, Beever, Helms, Moldal, Lutterman, Ott, Roat, and Upton, 1998). The chapter cites other references individually. The References section contains a complete listing of all the resources used in creating this report.*

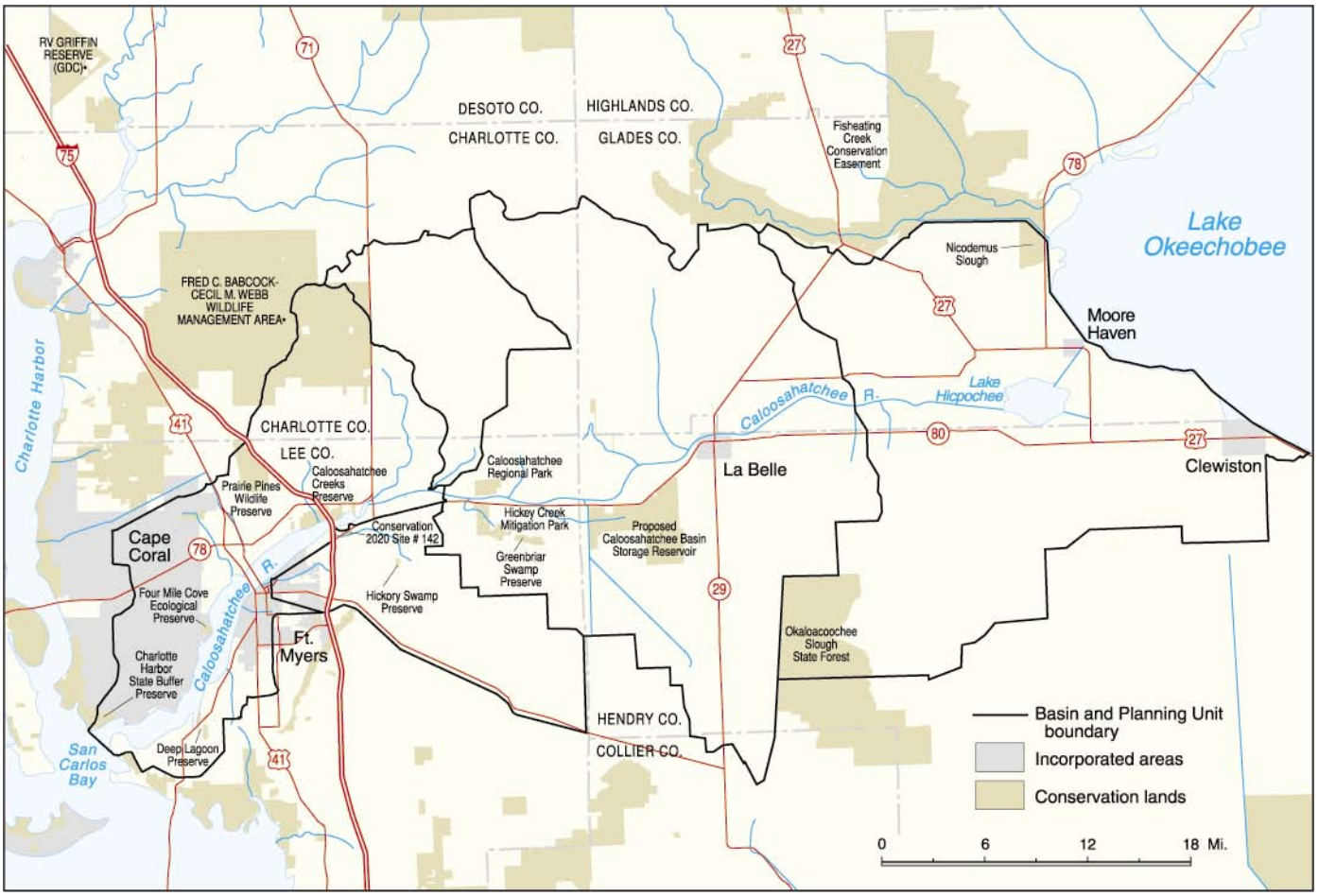


Figure 2.1: Geopolitical Map of the Caloosahatchee Basin

the Lower West Coast region. It provides agricultural needs, is used to recharge shallow wellfields, and provides a potable water supply for Lee County and the city of Fort Myers.

Population

Human habitation in southwest Florida is estimated to date back to the "nomadic" Paleo-Indians 13,500 years ago, followed by the Pre-Ceramic Indians from 6500 to 2000 B.C. Archaeological excavations on Useppa Island in Lee County indicate that the first permanent habitations occurred during the Ceramic Period, 2000 B.C. to 500 A.D. These "villagers" evolved into the more complex society known as the Calusa Indians, who reigned from 500 to 1750 A.D. The Calusa were excellent traders. Archaeological evidence traces their waterway network from Charlotte Harbor up the Caloosahatchee to Lake Okeechobee by way of canals at Ortona, thus making the Calusa the first humans to create a physical link between the Caloosahatchee and Lake Okeechobee.

Spanish conquistadors subsequently occupied the region and within 200 years, the Calusa became extinct. After the French and Indian War in 1763, Florida became English territory, and the Creek Indians moving into the area became known as the Seminoles. Florida was returned again

to Spanish rule in 1783 and finally annexed by the United States in 1821. The U.S. government expanded its military presence in the Caloosahatchee region in 1837 at Fort Dulaney (now Punta Rassa) and in 1841 at Fort Harvie (renamed Fort Myers in 1850). The population of the Caloosahatchee Valley was estimated at 200 in the early 1870s. By the 1880s, population growth accelerated as "Everglades drainage projects" started reshaping the Caloosahatchee River (Kimes and Crocker, 1998). The section on **"Watershed Management Activities and Processes"** in this chapter contains a historical timeline of the region.

Today, southwest Florida is growing rapidly. **Table 2.1** lists the region's population growth by county. Some of the larger population centers in the basin are Fort Myers, Cape Coral, North Fort Myers, Lehigh Acres, LaBelle, Moore Haven, and Clewiston. **Figure 2.1** shows the principal geopolitical features in the Caloosahatchee Basin.

Table 2.1: Population Growth by County in the Caloosahatchee Region

County	1990	2000	2010	2020
Charlotte	110,975	141,627	171,293	199,433
Lee	335,113	440,888	565,703	678,353
Glades	7,591	10,576	12,169	13,767
Hendry	25,773	36,210	45,800	50,676
Total	479,452	629,301	794,965	942,229

Source: Florida Legislature, Office of Economic and Demographic Research Web site, 2005.

Land Use

Agriculture, forest, and rangeland dominate the upper (freshwater) part of the Caloosahatchee Basin, with urbanization occurring along the tidal coastal areas. The major urban centers along the tidal Caloosahatchee watershed basin are Fort Myers, Cape Coral, and North Fort Myers.

Table 2.2 shows the land use percentages in a broad (Level I) geographic information system analysis of the basin, carried out by the South Florida Water Management District (SFWMD) in 1998.

Economic Activity

Agriculture

Agriculture is the prominent land use in the inland portions of the Caloosahatchee Basin, and is expected to remain so in the future. Citrus, the dominant irrigated crop in the basin, occupies over 91,000 acres, according to the 1995 Land Use Coverage. Over the past two decades, southwest Florida has had the fastest expanding citrus acreage in the state. This is associated with the movement of citrus southward from central Florida following several severe freezes in the mid-1980s (SFWMD, 2000a).

Table 2.2: Level I 1998 Land Use in the Caloosahatchee Basin

Level I	Type	Percent of Basin
1000	Urban and Built-Up	15.4
2000	Agriculture (includes improved pasture)	40.8
3000	Rangeland	5.6
4000	Upland Forest	17.7
5000	Water (includes open bay)	2.6
6000	Wetlands	15.5
7000	Barren Land	1.0
8000	Transportation, Communications, and Utilities	1.4
Total		100

Sugarcane, with an estimated 75,000 acres in the Caloosahatchee Basin, closely follows citrus in dominance. It is produced in close vicinity to Lake Okeechobee, in Hendry and Glades Counties, where transportation costs to the mills can be minimized. Sugarcane acreage has continued to increase since 1995, and the increase is expected to continue (SFWMD, 2000a).

Beef cattle follow citrus and sugarcane in economic importance. In 1999, Florida ranked third among the states east of the Mississippi River and twelfth nationally in the number of beef brood cows, at 973,000 head (Florida Department of Agriculture and Consumer Services [DACS], 1999). Hendry and Glades Counties are the third and eighth leading counties in beef cattle production, with 97,000 and 69,000 head, respectively. Charlotte and Lee Counties also have beef cattle, with a combined herd of 39,000 head (DACS, 1999).

Other economically significant agricultural goods produced in the region include tomatoes, bell peppers, watermelon, squash, and cucumbers. Rice and sweet corn are frequently grown on the same acreage as sugarcane during fallow periods. **Table 2.3** lists the acreage of agricultural production by county. Note that the county acreages include some production outside the Caloosahatchee Basin, since no county lies wholly within the basin.

Table 2.3: Acreage of Agricultural Production by County

Crop	Charlotte County	Lee County	Hendry County	Glades County
Citrus	21,522	11,871	100,124	10,776
Sugarcane	N/A	N/A	71,000	19,000
Tomatoes	N/A	1,770	4,075	N/A
Bell Peppers	N/A	N/A	3,900	N/A
Watermelon	1,300	1,000	2,600	N/A
Squash	N/A	1,150	N/A	N/A
Cucumbers	N/A	N/A	1,100	N/A

N/A = Not applicable
Source: Florida Department of Agriculture and Consumer Services, 1999.

Recreation/Tourism

In 1993, approximately 1.7 million tourists vacationed in the 3 coastal counties of Sarasota, Charlotte, and Lee (Southwest Florida Regional Planning Council, 1995). Total tourism expenditures were more than $1.1 billion, with vacationing tourism dollars contributing 53 percent of total tourism spending (CHNEP, 1998). Popular recreational activities in the region are closely tied to the health of water resources and include boating, swimming, sunbathing, and fishing.

About one-third of all tourists who come to Florida go fishing, and 21 percent of the local population also engage in recreational fishing (CHNEP, 2000a). An economic study commissioned by CHNEP (1998) valued the recreational fishery in the region at $107.2 million annually.

Commercial Fishing

The Caloosahatchee/Charlotte Harbor region has a very important commercial fishery, valued at $22.6 million annually. Of this, $19.1 million comes from Lee County alone (CHNEP, 1998). Commercial species caught include cobia, flounder, black mullet, permit, pompano, spotted seatrout, lane snapper, mangrove snapper, tripletail, and blue crabs.

Surface Water Resources

The Caloosahatchee Basin contains numerous surface waterbodies. Surface waters, including lakes, streams, and wetlands, occupy approximately 162,973 acres, or about 18.1 percent of the total basin area. This section delineates the basin's hydrology, describes the movement and management of water in the basin, briefly describes the major characteristics of surface waters that influence water quality in the basin, and describes surface water classifications and special designations.

Figure 2.2 shows the locations of the largest waterbodies. A more detailed discussion in Chapter 3 provides information on each planning unit.

The Caloosahatchee Basin lies predominately within the Caloosahatchee River Valley, which rises less than 15 feet in elevation through Lee, Hendry, and Glades Counties. The valley axis follows the river from Lake Okeechobee to San Carlos Bay. The basin includes a portion of the Immokalee Rise, an elevated flat area of predominately sandy soils to the southwest of the river; the Gulf Coastal Lowlands, which parallels and borders the western coastal areas of the state; the Caloosahatchee Incline, a valley wall that slopes upward to the north end of the river; and the DeSoto Plain, a very flat terrace extending down from the Polk Uplands of the Central Florida Highlands (SFWMD, 2000a).

Historically, the Caloosahatchee River originated as overland flow from Lake Okeechobee through marshlands and swamp forest (CHNEP, 2000a). In 1882, Hamilton Disston dug a canal linking Lake Okeechobee to the Caloosahatchee River. Several drainage districts channeled the river further between 1905 and 1927 (Fernald and Purdum, 1998).

The modern Caloosahatchee River (C-43) is a channelized flood control and navigational water, maintained by the U.S. Army Corps of

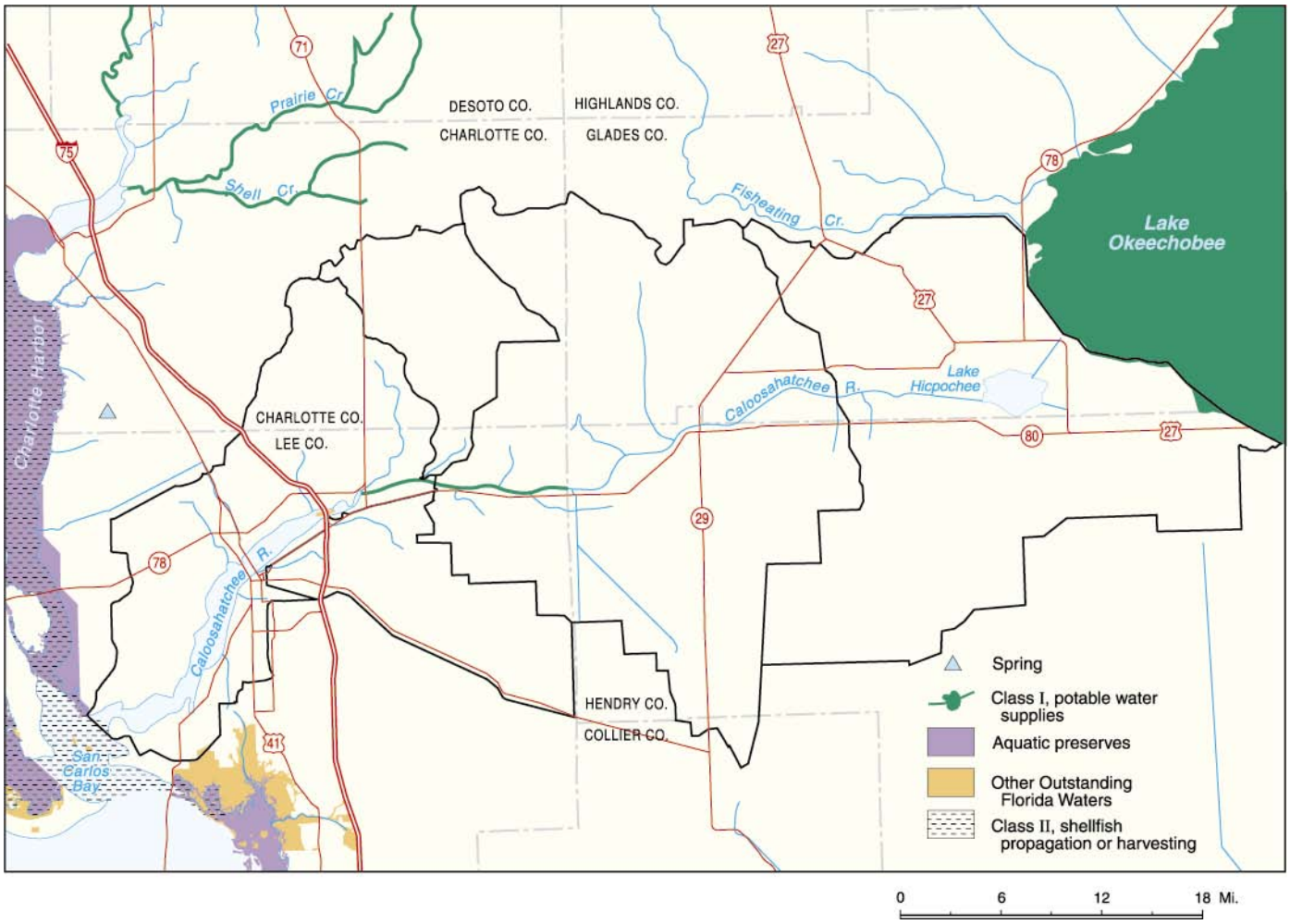


Figure 2.2: Surface Water Resources of the Caloosahatchee Basin

Engineers (USACOE) as part of the Okeechobee Waterway, which links the Gulf of Mexico to the Atlantic Ocean via Lake Okeechobee and the Lucie Canal and River. Three lock and spillway structures control the river from Lake Okeechobee to San Carlos Bay. The Moore Haven Lock and Spillway (S-77), on the western shore of Lake Okeechobee, regulates lake waters and lowers the water from Lake Okeechobee down to 11 feet NGVD (National Geodetic Vertical Datum). The Ortona Lock and Spillway (S-78) helps to control water levels on adjacent lands upstream, lowers the water downstream to 3 feet NGVD, and separates the C-43 into eastern and western basins. The Franklin Lock and Dam, near Olga in Lee County, artificially separates the fresh water of the Caloosahatchee River from the salt water of the estuary. It lowers the water level to 1 foot NGVD, regulates freshwater discharge into the estuary, and acts as an impediment to saltwater intrusion upriver. It also marks the beginning of the 30-mile tidal basin of the Caloosahatchee River, which starts at the lock and continues to the Gulf of Mexico (Capece, Flaig, Cassani, and Kibbey, SFWMD, 2000a).

The freshwater portion of the river ranges from 165 to 430 feet in width and 20 to 30 feet in depth. Many of the original bends remain as

oxbows along both sides of the canal. The width of the estuarine portion is irregular, from 530 feet in the upper portion to 1.5 miles downstream at San Carlos Bay. The narrow section extends from Franklin Lock and Dam to Beautiful Island. This area has an average depth of 20 feet, and the area downstream of Beautiful Island has an average depth of 5 feet (SFWMD, 2000a).

Twentieth-century transportation, channelization, drainage, irrigation, and waste disposal have had lasting effects on the Caloosahatchee River and its watershed. Both water quality and quantity have been altered by sewage discharges, stormwater runoff, extreme counterseasonal (i.e., dry season) freshwater releases from Lake Okeechobee, pesticide spills, thermal effluent, and exotic nuisance species (CHNEP, 2000a).

Agribusiness has converted many uplands and wetlands east (upstream) of Franklin Lock to intensive agricultural uses. The conversion includes numerous drainage and irrigation canals where crop demands affect water flow into or out of the river. The citrus industry has expanded significantly into the upper watershed during the past decade (due to severe citrus freezes in central Florida) and depends on the control of soil moisture levels (CHNEP, 2000a). As such, the pattern and period of flow of the Caloosahatchee River are highly variable and are often negative (from west to east), possibly from irrigation usage (SFWMD, 2000a). From December 2001 through the end of January 2002, the SFWMD released small pulses of fresh water from Lake Okeechobee into the Caloosahatchee River in an attempt to reduce the estuary's salinity (SFWMD, 2001).

Surface Water Quality Classifications

Class I:

- Caloosahatchee River—east of Franklin Lock (S-79) to the Lee/Hendry County line.
- Lake Okeechobee—flanking the basin on the eastern border.

Class II:

- San Carlos Bay—a small portion at the mouth of Caloosahatchee River.

Class III and Class IV:

- The remainder of the state waters in the basin (portions of Charlotte, Lee, Glades, and Hendry Counties) are Class III unless specifically designated as Class IV waters. Class IV waters consist of all secondary and tertiary canals or ditches wholly within agricultural areas behind a water control structure permitted by the water management district under Chapters 373.103, 373.413, or 373.416, Florida Statutes (F.S.).

Class V:

- The basin contains no Class V waters.

Shellfishing Areas:

- There are no shellfishing-approved areas in the basin.

Florida's water quality standards, the foundation of the state's program of water quality management, designate the "present and future most beneficial uses" of the waters of the state (Subsection 403.061[10], F.S.). Water quality criteria for surface water and ground water, expressed as numeric or narrative limits for specific parameters, describe the water quality necessary to maintain these uses. Florida's surface water is classified using the following five designated use categories:

Class I	Potable water supplies
Class II	Shellfish propagation or harvesting
Class III	Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
Class IV	Agricultural water supplies
Class V	Navigation, utility, and industrial use (there are no state waters currently in this class)

Special Designations

Outstanding Florida Waters

Table 2.4 lists the Outstanding Florida Waters (OFWs) in the Caloosahatchee Basin that have been given additional protection through the OFW designation.

OFWs are designated for "special protection due to their natural attributes" (Section 403.061, F.S.). These waters are listed in Section 62-302.700, Florida Administrative Code (F.A.C.). The intent of an OFW designation is to maintain ambient water quality, even if these designations are more protective than those required under the waterbody's surface water classification. Most OFWs are associated with managed areas in the state or federal park system, such as aquatic preserves, national seashores, or wildlife refuges. Other OFWs may also be designated as "Special Waters" based on a finding that the waters are of exceptional recreational or ecological significance, and are identified as such in Rule 62-302, F.A.C.

Table 2.4: OFWs in the Caloosahatchee Basin, by County

County	Location
Charlotte	None
Glades	None
Hendry	None
Lee	• Caloosahatchee National Wildlife Refuge • Estero Bay Conservation and Recreation Lands (CARL)—a very small sliver in this basin • Matlacha Pass Aquatic Preserve—a very small portion near the mouth of the Caloosahatchee River

Surface Water Improvement and Management Priority Waters

On February 13, 2003, the SFWMD Governing Board adopted a resolution naming the lower Charlotte Harbor a Surface Water Improvement and Management (SWIM) waterbody. This designated SWIM area includes the Caloosahatchee Estuary, San Carlos Bay, Estero Bay, Matlacha Pass, and Pine Island Sound. Other designated SWIM waterbodies in the region include Charlotte Harbor Proper, north of Pine Island Sound and Lake Okeechobee, at the headwaters of the Caloosahatchee River. The section on **"Watershed Management Activities and Processes"** in this chapter provides additional details.

In 1987, the Florida legislature created the SWIM Program to restore waterbodies. The initial legislation identified 6 priority waterbodies: Lake Apopka, Tampa Bay, Indian River Lagoon, Biscayne Bay, Lower St. Johns River, and Lake Okeechobee. Today, SWIM plans have been developed for 30 waterbodies statewide. The SWIM Program addresses a waterbody's needs as a system of connected resources, rather than isolated wetlands or waterbodies. The state's 5 water management districts work with federal, state, and local governments and the private sector to develop and implement SWIM plans to restore damaged ecosystems, prevent pollution from runoff and other sources, and educate the public.

Minimum Flows and Levels

Under the Florida Watershed Restoration Act (FWRA) (Chapter 373, F.S.), a minimum flow and level (MFL) is the limit at which further water withdrawals will cause significant harm to the water resources of the area and related natural systems. Consumptive use and alterations to their watersheds have reduced or have the potential to reduce the amount and timing of surface water being delivered. Projected increases in withdrawals also could reduce future flows and levels.

To help determine the amount of water that is available for environmental and human uses, the SFWMD must determine MFLs. Lakes and aquifers have minimum levels. Minimum flows are set for rivers and streams.

An MFL was established for the Caloosahatchee River on September 10, 2001. This MFL requires a minimum mean monthly flow of 300 cubic feet per second to maintain sufficient salinities at S-79 in order to prevent an MFL exceedance. An MFL exceedance occurs during a 365-day period, when

(a) A 30-day average salinity concentration exceeds 10 parts per thousand (ppt) at the Fort Myers salinity station (measured at 20 percent of the total river depth from the water surface at Latitude 263907.260, Longitude 815209.296); or
(b) A single daily average salinity exceeds a concentration of 20 ppt at the Fort Myers salinity station.

An exceedance of either paragraph (a) or (b) for two consecutive years is considered a violation of the MFL.

Ground Water Resources

Aquifers

The soils in the Caloosahatchee Basin are generally coarse and sandy with a high infiltration capacity. Horizons of less permeable, finer sediments are found locally, especially in depression areas. The upper aquifer system consists of shells, sand, and limestone with a relatively high hydraulic conductivity.

Shallow water tables are found in most parts of the basin. The water table response to rainfall indicates a close link between rainfall, surface water, and ground water. The Tamiami aquifer in the eastern part and the Sandstone aquifer in the western part of the basin constitute the major sources of ground water in the basin (Dodson, 2002).

Ground Water–Surface Water Interactions

The Caloosahatchee Basin is characterized by a direct coupling between surface water and ground water. As a result, the residues of chemicals used on crops, lawns, and golf courses are equally shared between ground water and surface water.

When the water table of the upper aquifer rises above the drainage level, the excess volume is routed to a receiving point. The receiving point for drainage flow may be a depression or a stream. Drainage networks, high conductivities for the subsurface flow, and high hydraulic contact between aquifer and canals cause rapid runoff to the C-43 Canal following rainfall events. A comparison of rainfall records and measured flow at the C-43 locks shows a rapid hydrologic response in water levels and flows (Dodson, 2002).

Ground Water Usage

The region receives approximately 52 inches of rainfall per year on average. The region's population is projected to increase by 45 percent by 2020. Agricultural acreage is expected to increase by 7 percent overall; it is also anticipated, however, that there will be conversion from pasture and row crops to citrus and sugarcane. The total average water demand is projected to increase by 45 percent to 232 billion gallons per year by 2020 (SFWMD, 2000a). The challenge to water managers will be meeting human water demands while addressing the water needs of the environment. The development of effective, long-term water supply strategies is imperative to maintaining the region's economic and environmental sustainability.

Water Resource Caution Areas

The SFWMD has designated all of the Caloosahatchee Basin, except for that portion in Charlotte County and a very small sliver of Glades County, as Water Resource Caution Areas (WRCAs) (SFWMD, 2000b).

Under Section 373.036, F.S., and Subsection 62-40.520(1), F.A.C., each water management district in the state must identify WRCAs in which potential water shortages, considerable reductions in water levels, saltwater intrusion, or other degradations may occur within 20 years, and must develop management plans to address their water resource problems.

In these areas, existing and anticipated sources of water and conservation efforts may not be adequate to supply water for all existing legal uses and reasonably anticipate future needs, and still sustain water resources and related natural systems. Five constraints are considered in establishing these WRCAs:

- Impacts to native vegetation, primarily wetlands;
- Impacts to minimum flows and levels, primarily spring flows;
- Impacts to ground water quality in terms of increased saltwater intrusion;
- Impacts to existing legal users; and
- Failure to identify a source of supply for future development.

Watershed Management Activities and Processes

Over the years, management plans and activities in the basin have been implemented to eliminate wastewater discharges; reduce the discharges of polluted stormwater from urban and agricultural areas; and protect, preserve, and restore special areas. The following section describes historical, current, and ongoing activities and processes to address water quality problems. **Table 2.5** provides a timeline summary.

Much of the progress in the Caloosahatchee Basin in developing water quality restoration plans and implementing watershed and water quality improvements is attributable to coordinated local, state, and regional efforts. In particular, local organizations and initiatives have provided leadership in waterbody restoration and preservation efforts. Many plans share common goals, and their implementation is based on various groups playing critical roles in planning, funding, managing, and executing projects. The Florida Department of Environmental Protection (Department) continues to coordinate its efforts with these entities to obtain data, improve monitoring activities, and exchange information through periodic meetings.

Historical Issues and Activities

Conditions in and around the Caloosahatchee Basin have changed dramatically in the last century. The freshwater portion of the river has been reconfigured into a canal (C-43), extending 45 miles from the Moore Haven Lock and Dam (S-77) at Lake Okeechobee to Franklin Lock and Dam (S-79) to better convey floodwaters to the Gulf of Mexico. Drainage has increased throughout the region because of agricultural and residential development and roadway construction.

A number of significant events, including the following, have contributed greatly to ecological and hydrologic modifications in the region.

Table 2.5: Timeline Summary of Environmental Issues and Activities in the Caloosahatchee Basin

Year	Issues and Activities
1881–1899	Florida sells 4 million acres of land to Hamilton Disston in 1881. In 1882, he begins dredging a canal between Lake Okeechobee and the Caloosahatchee River, initiating a series of actions affecting lake levels and downstream waters. In 1883, the cities of Alva and Olga are established along the Caloosahatchee River. The canal connecting Lake Okeechobee, Lake Hicpochee, and the Caloosahatchee at LaBelle is completed in 1884; floods become frequent and destructive. A 7-foot channel dredged through the lower river is completed in 1885. The city of Fort Myers is incorporated in 1885. Hamilton Disston, facing bankruptcy, commits suicide in 1896. Lee County is formed in 1887, encompassing 2 million acres in the Caloosahatchee region. The Menge brothers purchase and refit Disston's dredges, creating the first regular freight-shipping line on the Caloosahatchee in 1890. A freeze destroys the majority of north Florida citrus in 1894–95; Caloosahatchee citrus, which is not affected, brings a premium. As a result, thousands of acres are planted with new citrus in the Caloosahatchee region. The U.S. Army Corps of Engineers (USACOE), under the Federal Rivers and Harbor Act, recommends navigational improvements (channelization) for the Kissimmee–Okeechobee–Caloosahatchee watershed in 1899.
1904–1916	Napoleon Bonaparte Broward is elected governor of Florida in 1904 on a promise to drain the Everglades. The Florida legislature creates the Everglades Drainage District in 1907, publicly funding drainage and flood-control projects around Lake Okeechobee. This "district" is the first of several to carry out drainage projects in south Florida. The U.S. government appropriates monies in 1909 to improve navigational access from the Caloosahatchee River through Lake Okeechobee to Florida's east coast. Intensive canal construction takes place near Lake Okeechobee and in the Everglades in 1910. The Okeechobee Waterway improvements are completed, and the first steamship crosses the state in 1912. Unusually heavy June rains in 1912 push the Caloosahatchee River beyond its capacity. On June 14, the Caloosahatchee has a higher elevation than Lake Okeechobee, and the river flows upstream from LaBelle 20 miles into Lake Okeechobee. The General Drainage Act of 1913 authorizes adjacent landlords to establish drainage districts to drain and "reclaim" their lands. The construction of Tamiami Trail begins in 1916.
1918–1929	The first locks are completed at Moore Haven in 1918. Several major hurricanes hit south Florida between 1922 and 1928. The 1926 hurricane causes Lake Okeechobee to flood, taking more than 400 lives in the Moore Haven area. By 1927, Lake Okeechobee is connected to the Atlantic Ocean via the Miami River, North New River, Hillsboro, West Palm Beach, and St. Lucie Canals, and to the Gulf of Mexico via the channelization of the Caloosahatchee River. Despite these flood control measures, Lake Okeechobee flooding during a 1928 hurricane kills more than 2,000 people south of the lake. The Tamiami Trail is completed by 1928. The Okeechobee Flood Control District is established in 1929 in response to the Lake Okeechobee flooding. The maximum lake stage elevation is lowered from 19 to 17 feet above mean sea level (MSL). Lake elevations begin to be regulated through discharges to the Atlantic and Gulf.
1930–1937	In 1930, the Federal Rivers and Harbors Act authorizes the enlargement of the Caloosahatchee and St. Lucie Canals and the construction of a navigational channel for Lake Okeechobee's south shoreline. Spoil from the channel becomes the 30-foot Hoover Dike, which is completed in 1937, flanking three-quarters of the lake. In 1937, the Ortona Lock is completed and the Caloosahatchee River has a navigable channel 7 feet deep and 80 feet wide.
1947–1959	In 1947, two hurricanes flood south Florida. The existing canal network is unsuccessful in alleviating flood conditions. In response, Congress passes the Flood Control Act of 1948, authorizing the USACOE to create a huge, multistage flood control project in south Florida. The 1949 Florida legislature creates the Central and Southern Florida (C&SF) Flood Control District to operate and maintain the flood control project. All functions and assets of the Okeechobee Flood Control District and the Everglades Drainage District are eventually vested in the new C&SF district. Red tide affects 400 square miles (including offshore waters) from Boca Grande to Sanibel Island from June to December 1952. Red tide occurs from Pinellas County southward to Sanibel Island in 1953–54. Red tide kills fish from Clearwater to Fort Myers in 1959; Sanibel Island is one of the hardest-hit areas.

Table 2.5 (continued)

Year	Issues and Activities
1960–1971	Improvements begin on the Hoover Dike in 1960. Red tide is observed from Tampa Bay to Marco Island in April 1963. The Hoover Dike is raised to 40 feet above MSL and by 1964 extends completely around Lake Okeechobee. Red tide and fish kills in the Fort Myers area are reported from August 1967 to January 1968. Franklin Lock, the control mechanism between fresh water and salt water on the Caloosahatchee River near Olga, is completed in 1969. The maximum stage on Lake Okeechobee is lowered in 1970 and regulated between 14.0 and 15.5 feet above MSL (wet and dry season, respectively). An extreme drought occurs in south Florida in 1970–71. The 1971 Governor's Conference on Water Management in South Florida concludes that water quality is steadily deteriorating in practically all aquatic systems in southern Florida, and that water quantity is not being managed to ensure a minimum adequate supply during dry season. Red tide is reported in the Fort Myers area from May to September 1971.
1974–1979	Red tide is reported in the Fort Myers area from January to June 1974. In August 1974, the Lake Okeechobee regulation schedule is raised to 15.5 to 17.5 feet MSL (wet and dry season, respectively), creating long periods of high water. The Florida legislature passes the Aquatic Preserves Act in 1975, creating a statewide system of specially protected and managed aquatic areas. The Florida Department of Environmental Regulation is created in 1975. In 1976, the C&SF Flood Control District is renamed the South Florida Water Management District (SFWMD). The SFWMD initiates a study in 1978 to develop a water quality database for the Caloosahatchee River and its tributaries. In January 1979, the governor of Florida forms the Charlotte Harbor Resource Planning and Management Committee, which is charged with ensuring the protection of Charlotte Harbor and adjoining coastal estuaries. The 1979 legislative session creates the Conservation and Recreation Lands (CARL) Program for land acquisition.
1981–1990	The Florida legislature passes the Save Our Rivers (SOR) Act in 1981. The SOR Program authorizes the water management districts to purchase lands along rivers. The Governor and Cabinet approve the Charlotte Harbor Resource Planning and Management Plan in 1981, under Section 380.045, F.S. A SFWMD survey of water quality characteristics and chlorophyll *a* concentrations for the Caloosahatchee River system is completed in 1982 (Tech. Pub. 82-4). Red tide kills 39 manatees in the Caloosahatchee River area in February and March 1982. In 1984, the U.S. Fish and Wildlife Service completes an extensive review and synthesis of the available literature on the ecology of and environmental alteration of the Caloosahatchee River (FWS/OBS 82/58.2). In 1987, the Florida legislature passes the Surface Water Improvement and Management (SWIM) Act, a statewide program for protecting and restoring priority surface waterbodies of regional significance. Lake Okeechobee is one of six original listed waterbodies. Congress establishes the National Estuary Program through amendments to the Water Quality Act in 1987. The Florida legislature adopts Governor Bob Martinez's Preservation 2000 (P-2000) Program in 1990, which provides funds for the CARL and SOR land acquisition programs.
1992–1996	The Southwest Florida Water Management District (SWFWMD) assembles an advisory committee in 1992 to prepare a SWIM Plan for Charlotte Harbor, which is subsequently approved in early 1993. Governor Lawton Chiles nominates Charlotte Harbor as an "estuary of national significance" in 1995, and Charlotte Harbor is accepted into the National Estuary Program, 1 of only 27 other watersheds in the United States to receive the designation. The longest red tide bloom recorded in Florida is present in varying concentrations from Tarpon Springs to the Keys from late 1994 through April 1996, contributing to massive manatee mortality in 1996; 45 percent of these manatee deaths occur in Lee County alone. Congress passes the Everglades and South Florida Ecosystem Restoration Act in 1996 to restore water quality and basic hydrologic patterns in the Everglades/South Florida ecosystem, including the Caloosahatchee River.

Table 2.5 (continued)

Year	Issues and Activities
1997–1999	Governor Chiles issues an executive order requiring the water management districts to develop a priority list and schedule for the establishment of minimum flows and levels (MFLs) for surface water and ground water by November 15, 1997. During the El Niño event of 1997–98, the SFWMD releases extreme amounts of fresh water from Lake Okeechobee to the St. Lucie and Caloosahatchee Estuaries (from early January to late April 1998). Fish with lesions, ulcers, and bloody spots are collected in Charlotte Harbor from mid-April to mid-June, 1998. Phosphorus loading to Lake Okeechobee continues to exceed target levels in 1998, and the Lake Okeechobee Issue Team is formed as a subset of the South Florida Ecosystem Restoration Working Group (SFERWG) to identify ways to enhance the ecological values of Lake Okeechobee. The Florida legislature establishes the Florida Forever Program in 1999, which replaces P-2000. This new program provides $300 million a year for preservation and restoration efforts.
2000–2002	The Charlotte Harbor Management Conference approves the CHNEP Comprehensive Conservation and Management Plan (CCMP) in February 2000. In 2000, the Florida legislature passes the Lake Okeechobee Restoration Investment Act (Chapter 2000-130, Laws of Florida), which requires the completion of a lake protection plan and provides $38 million to implement construction projects consistent with the SFERWG. The SFWMD lowers water levels in Lake Okeechobee by 2 feet in April 2000, again discharging extreme amounts of fresh water into the St. Lucie and Caloosahatchee Estuaries. CHNEP sends a letter to the water management district stating that the extreme releases of fresh water from Lake Okeechobee into the Caloosahatchee River are not consistent with the CCMP. A moderate bloom of red tide occurs from Charlotte Harbor to Key West in spring 2000. Fish with lesions, ulcers, and red lips/fins are collected in Charlotte Harbor from early May to early August 2000. A red tide bloom of varying concentrations ranges from southern Pinellas County to Collier County from September through December 2001. The SFWMD releases pulses of fresh water from Lake Okeechobee to the Caloosahatchee River and Estuary from December 2001 through the end of January 2002. Mullet with lesions are caught in the Caloosahatchee Estuary downstream of Franklin Lock from December 2001 to late January 2002. Another red tide event occurs along the Gulf Coast in early February 2002, ranging from Tampa Bay to Naples. The Lee County Board of County Commissioners petitions the SFWMD and the Department for a Chapter 373.233(4) reservation of water for the Caloosahatchee River and Estuary for fish and wildlife.
2003	On February 13, 2003, the SFWMD Governing Board adopts a resolution naming the lower Charlotte Harbor a SWIM waterbody. The designated SWIM area includes the Caloosahatchee Estuary, San Carlos Bay, Estero Bay, Matlacha Pass, and Pine Island Sound.

Agriculture

Agribusiness has converted many uplands and wetlands east (upstream) of Franklin Lock to intensive agricultural uses (see the section on **"Economic Activity"** earlier in this chapter). The conversion includes numerous drainage and irrigation canals where crop demands regulate river flows into or out of the adjacent canals. The citrus industry, which is highly dependent on the control of soil water levels, has expanded significantly into the upper watershed during the past decade as a consequence of severe freezes in central Florida in the 1980s (CHNEP, 2000a).

Water quality in the Caloosahatchee Basin is threatened by altered freshwater inputs, nutrient loads, and trace elements from agricultural development in the watershed (SFWMD, 2002).

Residential Development and "Roads to Nowhere"

The real estate sales and land development boom that began in the 1950s dramatically and permanently changed the character and use of the Caloosahatchee region. Lowlands were dredged and filled, and pastures

and cropland were drained and cleared to create over a million platted home sites in southwest Florida (Southwest Florida Regional Planning Council, 1995). Even though some of these extensive tracts of land were platted and sold 20 years ago, very few houses were built. Most of the platted lots and streets lie empty and overgrown. The platting removed thousands of acres from agricultural and other productive uses years in advance of when the land would actually be needed for housing (Estevez, Beever, Helms, Moldal, Lutterman, Ott, Roat, and Upton, 1998). In the meantime, continued road building near the urban centers of Fort Myers, North Fort Myers, Cape Coral, and Lehigh Acres is opening up even more agricultural lands and natural habitat to urban development.

Hydrologic Alterations—"Famine or Feast"

Human activities have significantly altered the amount and timing of freshwater flows into the lower Caloosahatchee/San Carlos Bay Estuary, at times denying the system its historical supply of fresh water and at other times deluging it (American Oceans Campaign Web site, 1996). As stated previously, the modern Caloosahatchee River (C-43) is a highly regulated, channelized, flood control and navigational waterbody with three lock and spillway structures controlling river flow from Lake Okeechobee to San Carlos Bay. In addition, agribusiness has dug numerous drainage and irrigation canals in the upper two-thirds of the basin, where crop demands regulate river flows into or out of the adjacent canals (CHNEP, 2000a). Downstream, considerable urban runoff can enter the lower river and estuary from the extensive network of navigation and drainage canals in Lee County (CHNEP, 2000a).

Interceptor waterways on the Cape Coral Peninsula collect runoff from canal systems and store large volumes of brackish water inland of fringing mangrove systems. This practice alters the timing of flow to the Caloosahatchee/San Carlos Bay Estuary. In addition, Lee County and Fort Myers draw about 10 million gallons per day (mgd) of drinking water from the Caloosahatchee River upstream of Franklin Lock, denying some freshwater flow to the estuary.

The Caloosahatchee/San Carlos Bay Estuary also has had occasional deluges of fresh water from Lake Okeechobee via the Caloosahatchee River, as a result of the management of Lake Okeechobee's lock system. The USACOE and SFWMD currently manage Lake Okeechobee and the Caloosahatchee River for competing objectives such as flood control, water supply (potable and agricultural), navigation (the Lake Okeechobee Waterway), and ecological restoration (the Comprehensive Everglades Restoration Plan [CERP]). Although management practices have improved, submerged aquatic vegetation, oyster reef coverage, and bay scallop populations have been drastically harmed by the sudden, large freshwater infusions (Southwest Florida Regional Planning Council, 1995). The nutrient-enriched deluges have also been implicated in algal blooms (SFWMD, 2000b), including toxic *cyanobacteria* in the estuarine Caloosahatchee/San Carlos Bay area (Barienbrock, 2001). Extremely low salinities from these discharges are also thought to be responsible for the presence of a fungus called *Aphanomyces invadens* and the occurrence of fish with

lesions in the Caloosahatchee/San Carlos Bay and St. Lucie Estuaries (Lollar, 2002; Sosa, 2002).

Red Tides

Red tides are quite common in the Gulf of Mexico–southwest Florida region. Red tides were first documented in Florida in 1530, when Alvar Nuñez Cabeza de Vaca, the Spanish explorer, wrote about Indians who told him of fish kills in and around the Tampa Bay area.

A red tide is a higher-than-normal concentration of microscopic algae. During blooms, the organisms may color the water reddish, greenish, brownish, or purplish. *Karenia brevis*, the species that causes most red tides in Florida, produces a toxin that affects fish and shellfish, often killing millions of them. People who eat infected mollusks (clams, oysters, coquinas, and mussels) can suffer central nervous system problems. As the red tide blooms approach coastal areas, the breaking waves allow the toxin to become mixed with sea spray, causing respiratory irritation (Florida Department of Health Web site, 2001).

A particularly widespread red tide event was thought to be responsible for massive manatee mortality in 1996 in Charlotte, Lee, and Sarasota Counties, with 142 manatees dying of "natural and undetermined causes." Lee County alone accounted for 45 percent of the total statewide manatee deaths for that category in 1996 (Florida Marine Research Institute Web site, 2002).

Ongoing Issues and Activities

The major issues affecting the Caloosahatchee Basin are water supply availability, Caloosahatchee River salinity variations, and Caloosahatchee River nutrient levels. No one organization is solely responsible for addressing these issues and for planning and implementing watershed and water quality improvements. Much of the progress and many of the plans in place to address existing and future problems are attributable to coordinated efforts such as the CERP or CHNEP.

A number of major restoration initiatives, if continued, will have major positive effects on the basin's water quality. The management activities described in this section often have many smaller projects included within them. A more complete listing of management and restoration efforts and projects and the adjacent regions can be found in the Status Report for the Caloosahatchee Basin, available at http://www.dep.state.fl.us/water/tmdl/stat_rep.htm.

Agricultural Best Management Practices

The FWRA authorizes the DACS to develop interim measures and agricultural best management practices (BMPs). Additional authority for agricultural BMPs is provided in legislation on nitrates and ground water (Section 576.045, F.S.), the Lake Okeechobee Protection Program (Section 373.4595, F.S.), Agricultural Water Conservation (Section 570.085, F.S.), and Florida Right to Farm Act Amendments (Section 823.14, F.S.). While BMPs are often adopted by rule, they are voluntary if not covered by regulatory programs. If they are adopted by rule and the Department

verifies their effectiveness, then implementation provides a presumption of compliance with water quality standards.

Over the last several years, DACS has worked with agriculturists, soil and water conservation entities, the University of Florida's Institute of Food and Agricultural Sciences, and other major interests to improve product marketability and operational efficiency by implementing agricultural BMPs, while at the same time promoting water quality and water conservation objectives. In addition, programs have been established and are being developed to create a network of state, local, federal, and private sources of funds for developing and implementing BMPs.

Manuals for Best Management Practices

To encourage growers to use BMPs, manuals have been published for a number of agricultural industries, including container-grown plants, blended fertilizer plants, agrichemical handling and farm equipment maintenance, cow/calf operations, aquaculture, citrus, and landscaping. Many of these manuals can be downloaded at http://www.dep.state.fl.us/water or http://www.floridaagwaterpolicy.com.

Manuals for row crops, equine or horse farms, and ornamental nurseries are currently being developed. The use of a BMP manual alone, however, does not afford a presumption of compliance with the Department's water quality standards. In general, qualifying for a presumption of compliance requires that a site-specific BMP assessment process be in place or that practices being used have been proven effective through research and demonstration. BMP manuals pertinent to the Caloosahatchee Basin include the following:

- **Guide for Producing Container Grown Plants:** This manual, published in 1995 by the Southern Nurserymen's Association, includes irrigation and fertilization BMPs for the container cultivation of nursery plants. It was produced through a cooperative effort between the University of Florida, Auburn University, Tennessee Tech University, and Virginia Tech. Since the manual is not Florida-specific, an effort is currently under way to use the document in developing a Florida-specific manual.
- **BMPs for Blended Fertilizer Plants in Florida:** The manual for blended fertilizer industrial operations, published in October 1997, was cooperatively produced by the Florida Fertilizer and Agrichemical Association, DACS, and the Department.
- **BMPs for Agrichemical Handling and Farm Equipment Maintenance:** Recently revised and reprinted, this manual gives producers guidance on hazardous materials, proper pesticide handling, and the proper disposal of waste products. It was cooperatively produced in 1998 by DACS, the Department, and several industry associations.
- **Water Quality BMPs for Cow/Calf Operations:** Many cattle operators statewide have been trained in using this manual and are applying BMPs. The Florida Cattlemen's Association and several state, federal, and local agencies developed the manual, which was

published in 1999. Copies were printed and distributed in 2000 using U.S. Environmental Protection Agency (EPA) Section 319 grant funds.

- **Aquaculture BMPs:** As directed by the 1998 Florida legislature, DACS worked cooperatively with industry, state agencies, and the environmental community to develop a comprehensive BMP manual for aquaculture. Florida law requires that the Department adopt the manual by rule and provides regulatory exemptions under Chapters 373 and 403, F.S., for growers who implement BMPs and are certified by DACS' Division of Aquaculture. The manual, which was printed and distributed in 2000, has been adopted by rule.
- **Florida Green Industries BMPs for Protection of Water Resources in Florida:** This manual provides BMPs for professional turfgrass and landscape managers. Published in 2002, it was developed through a cooperative effort by Florida Green Industries (an industry association); the Department; DACS; the Florida Department of Community Affairs; and the St. Johns, South Florida, and Southwest Florida Water Management Districts.

Caloosahatchee Water Management Plan

This SFWMD plan, initiated in fiscal year 1998, provides a framework for future water use decisions to provide adequate surface water supply for urban areas, agriculture, and the environment through 2020 in the Caloosahatchee Basin. The plan estimates the future surface water supply needs of urban areas and agriculture, weighs these demands against historical surface water sources, and identifies areas where demands cannot be met without harming the resource and environment. The plan includes recommendations on how surface water deficits can be ameliorated. Initially, it seeks to supply more water to users, reduce the loss of water, and enhance and improve the quantity and quality of water through the following:

- Water harvesting (increasing runoff storage in streams and floodplains with structures),
- Surface water budget modeling,
- Saltwater intrusion evaluations,
- The implementation of a well abandonment program,
- The development of MFLs,
- The use of regional and small-scale reservoirs, and
- The use of aquifer storage and recovery (ASR) technology.

Caloosahatchee Water Quality Data Collection

This study, sponsored by the SFWMD, is the first phase of a three-year project, subject to District Governing Board appropriation, that will measure external loads (discharge and concentration) to the estuary from the Caloosahatchee River, the Orange River, wastewater treatment facilities,

and eight major rivers and creeks. Water quality data will also be collected in the Caloosahatchee Estuary.

The results will furnish important information about nutrient loading to the Caloosahatchee Estuary and the response of estuarine nutrient concentrations to external inputs. By quantifying the rates of nutrient loading from wastewater treatment facilities and rivers and streams, nutrient inputs can be ranked in order of importance. Nutrient input from the Caloosahatchee Basin can be compared with downstream inputs from the estuarine watershed.

Ultimately, a computational model (to be developed by the SFWMD) will be required to predict estuarine water quality parameters as a function of external inputs, internal hydrodynamics, and relevant processes and transformations occurring in the estuary. The project supplies data that can be used to model the relationship between external inputs and estuarine water quality. Using the model, researchers and planners will be able to derive estimates of the external loads that would be required to maintain water quality parameters within limits appropriate for a healthy estuarine system.

Charlotte Harbor National Estuary Program, Comprehensive Conservation and Management Plan

The CHNEP is a partnership of citizens, elected officials, resource managers, and commercial and recreational resource users collaborating to address diverse resource management concerns over the 4,400-square-mile watershed. A cooperative decision-making process was used to produce a Comprehensive Conservation and Management Plan (CCMP), which outlines priority actions that should be taken to improve the water quality and ecological integrity of the greater Charlotte Harbor watershed. The CHNEP receives most of its funding from the EPA, with some limited support from local and regional governments. Those portions of the Caloosahatchee Basin within the jurisdiction of CHNEP include the Caloosahatchee Estuary, Orange River, and Telegraph Swamp Planning Units.

Comprehensive Everglades Restoration Plan

The Central and Southern Florida (C&SF) Project was first authorized in 1948 to provide flood control, water control, water supply, and other services to an area that stretches from Orlando to Florida Bay. Although the project has fulfilled its original purposes, it has also contributed to an unintended decline in the south Florida ecosystem. As a result, a comprehensive review ("The Restudy") was conducted to investigate structural and operational modifications to the C&SF Project that would achieve the following:

- Improve the quality of the environment;
- Improve aquifer protection;
- Improve the integrity, capability, and conservation of agricultural and urban water supplies; and
- Maintain current levels of flood protection.

The Restudy, conducted by the USACOE and SFWMD, resulted in the CERP, which was transmitted to Congress on July 1, 1999. The activities associated with this restudy and restoration plan that directly affect the Caloosahatchee Basin are as follows:

- **Caloosahatchee River (C-43) Basin Aquifer Storage and Recovery Pilot:** ASR wells are proposed to maximize the benefits associated with the Caloosahatchee River Storage Reservoir and Treatment Area. A pilot project will identify the most suitable sites for the wells in the vicinity of the reservoir and determine their optimum configuration. The project will provide information on the characteristics of the aquifer system in the Caloosahatchee Basin and determine the hydrogeological and geotechnical characteristics of the upper Floridan aquifer. It will also determine the specific water quality characteristics of waters to be injected, the specific water quality characteristics and the amount of water recovered from the aquifer, and the water quality characteristics of water in the receiving aquifer. The project is scheduled to be implemented by 2008.

- **C-43 Basin Storage Reservoir Project, Part 1:** The project, which is the first part of the C-43 Basin Storage Reservoir and ASR component, includes an above-ground reservoir with a total storage capacity of approximately 160,000 acre-feet located in the C-43 Basin in Hendry, Glades, or Lee Counties. The initial design of the reservoir assumes a size of 20,000 acres, with water levels fluctuating up to 8 feet above grade. The final size, depth, and configuration of the facility will be determined through more detailed planning and design. The purpose of the project is to capture C-43 Basin runoff and releases from Lake Okeechobee. The reservoir will be designed to provide water supply benefits, some flood attenuation, environmental water supply deliveries to the Caloosahatchee Estuary, and water quality benefits to reduce salinity and the nutrient impacts of runoff to the estuary. It is assumed that, depending on the location of the reservoir and pollutant loading conditions in the watershed, the reservoir could be designed to achieve significant water quality improvements, consistent with appropriate pollution load reduction targets. Excess runoff from the C-43 Basin and Lake Okeechobee flood control discharges will be pumped into the proposed reservoir. Lake Okeechobee will meet any estuarine demands not met by basin runoff, as long as the lake stage is above a predetermined level. Lake water will also be used to meet the remaining basin demands, subject to supply-side management. The C-43 reservoir will be operated in conjunction with the Caloosahatchee backpumping project, which includes a stormwater treatment area for water quality treatment. If the level of water in the reservoir exceeds 6.5 feet and Lake Okeechobee is below a predetermined level, then water is released and sent to the backpumping facility. This phase of the project is scheduled to be implemented by 2011.

- **C-43 Basin Aquifer Storage and Recovery Project, Part 2:** This project, the second part of the C-43 Basin Storage Reservoir and ASR component, includes ASR wells with a total capacity of approximately 220 mgd and associated pretreatment and posttreatment, located in the C-43 Basin in Hendry, Glades, or Lee Counties. The initial design assumes 44 wells, each with a capacity of 5 mgd, with chlorination for pretreatment and aeration for posttreatment. The level and extent of treatment and the number of ASR wells may be modified based on findings from a proposed ASR pilot project. The purpose of this project is to capture C-43 Basin runoff and releases from Lake Okeechobee. The wells will be designed to provide water supply benefits, some flood attenuation, water quality benefits to reduce salinity and the nutrient impacts of runoff to the Caloosahatchee Estuary, and environmental water supply deliveries to the estuary. Excess runoff from the C-43 Basin and Lake Okeechobee flood control discharges will be pumped into the C-43 Basin Reservoir. Water from the reservoir will be injected into the ASR wellfield for long-term (multiseason) storage. Any estuarine demands not met by basin runoff and the ASR wells will be met by Lake Okeechobee, as long as the lake stage is above a predetermined level. Lake water is also used to meet the remaining basin demands, subject to supply-side management. This phase of the project is scheduled to be implemented by 2018.

C-43 Basin Pollutant Loading and Abatement Analysis

The Caloosahatchee River and Estuary have shown signs of water quality problems associated with altered salinity and eutrophication, including low levels of dissolved oxygen (DO), elevated nutrient concentrations, algal blooms, fish lesions, and seagrass die-off. Recognizing these problems, the Department hired contractors to determine the extent of water quality problems and the pollutant load reductions needed to improve surface water quality in the Caloosahatchee Basin.

For the C-43 Basin and the tidal Caloosahatchee River, a relatively good quantitative relationship was established between the desired water quality condition (i.e., chlorophyll *a* concentration target) and nitrogen loading. No relationship was found between the other water quality parameters and chlorophyll *a* concentrations in the tidal Caloosahatchee River.

Potential water quality targets were developed for chlorophyll *a* concentration. These targets were based on the standards/rule-based approach and a reference site approach. The standards/rule-based approach target was set at 11 micrograms per liter (µg/L), and the reference site approach target was 3.8 µg/L.

Using the standards/rule-based approach target of 11 µg/L chlorophyll *a*, the critical total nitrogen (TN) load during the dry season would be approximately 190 tons/month, and during the wet season, approximately 350 tons/month. Using the current period reference site approach target of 3.8 µg/L chlorophyll *a*, the critical TN load in the dry season months would be 0 tons/month, and in the wet season months, approximately

43 tons/month. The fact that the relatively high nutrient loads in the wet season did not necessarily result in higher chlorophyll *a* concentrations in the tidal river was attributed to a shortened residence time.

Environmental Impact Study on Improving the Regulatory Process in South Florida

The Jacksonville District of the USACOE initiated the Environmental Impact Study (EIS) out of concern for whether the incremental (permit-by-permit) reviews of applications under Section 404 of the Clean Water Act were adequately addressing the cumulative direct and secondary effects of wetland fill in the rapidly growing southwest Florida area. A landowner must apply for and receive a Department of the Army Permit before placing fill in waters of the United States, including wetlands.

The USACOE's concern initially focused on the Estero Bay watershed, when several large applications and preapplication discussions were ongoing along Daniels, Alico, and Corkscrew Roads. Each of the applications had similar recurring issues: the loss of spatial habitat (particularly for endangered species), changes in water quality and flows/timing for downstream waterbodies, and the appropriate amount and location of wetland mitigation. The issues especially came into the public eye with the submission of the application for a new university campus, the tenth in the state system (now named Florida Gulf Coast University). Several individuals who commented on the EIS viewed the proposed campus location as "jumping" the edge of suburban development into the remaining rural area. One concern was that the university would act as a magnet for the development of this rural area that would not otherwise occur. A second concern was that the permitting would set a precedent for future development.

After soliciting and reviewing public comments on the proposed scope of the EIS, the USACOE determined that the study should not be confined to the Estero Bay watershed, because natural areas and species range across multiple watersheds. To discuss one location of concern would also require looking at the relationships to surrounding areas. The watershed of concern was characterized as the hub and the surrounding areas as the spokes. The study area measured 1,556 square miles, with the northwest corner roughly defined by the cities of Fort Myers/Sanibel, the northeast by Lehigh Acres/Immokalee, the southwest by Naples, and the southeast by Everglades City.

The EIS disclosed the potential cumulative effects on a wide variety of issues as a result of 5 alternative predictions of future conditions. Each future scenario depicted what the landscape might or might not look like in 20 years, more or less, as a result of many individual decisions by the USACOE, landowners, counties, and others. Some, but not all, of the changes in the landscape will require a Department of the Army Permit. However, by depicting all changes, the EIS provided USACOE staff with a context for wetland permitting within the whole set of actions that have the potential to change the landscape.

The EIS document also compared the cumulative environmental and other effects resulting from each future scenario, for a wide variety of issues. This will enable staff to better understand how individual projects

might contribute to cumulative impacts. In addition, the EIS document described a proposal for USACOE staff to use a "Permit Review Criteria" document in their day-to-day review of applications.

Lee County Conservation 20/20 Land Acquisition and Stewardship Program

In 1996, voters approved a referendum to raise real property taxes by 0.5 mills ($.50 for each $1,000 in property value) to fund the purchase of environmentally sensitive lands to be placed in public trust for preservation. The Lee County Board of County Commissioners subsequently created the "Conservation 20/20" Land Acquisition and Stewardship Program in 1997 to fulfill voter directives. The purpose of the program is to acquire, preserve, and restore environmentally critical or sensitive lands in Lee County. Over $13 million per year are generated from property taxes, of which 90 percent of the funds are used for acquisition and 10 percent set aside for long-range management.

The acquisition of properties is from willing sellers, and no power of eminent domain is used. Each proposal goes through a ranking process, based on environmental significance, water resource value, management potential, contiguity to other preserve areas, development potential, and selling price. During the first 5 years of the program, over 10,000 acres were purchased, as follows:

- All lands will be restored to native habitats important for native wildlife,
- 38 miles of natural shoreline are now protected,
- 6,430 acres were acquired within mapped 100-year floodplain areas,
- 88 percent protect natural flow-ways,
- 88 percent provide storage for rainfall flooding,
- 41 percent are within the Coastal High Hazard Area, which is highly vulnerable to storm surge flooding,
- 31 percent are ground water recharge areas,
- 50 percent are wetlands,
- 50 percent are uplands, and
- All lands are open to the public for walking—other recreational opportunities will become available at key preserves.

Lower West Coast Water Supply Plan

This state-required regional water supply plan by the SFWMD serves as a guide for addressing future water demands in southwest Florida. The plan establishes a framework around which future water use decisions for the Lower West Coast (LWC) Planning Area can take place. The LWC Planning Area includes all of Lee County and a portion of Charlotte County. The plan seeks to accomplish the following:

- Develop a comprehensive water conservation program,
- Quantify the ground water resources available,
- Quantify the potential reclaimed water available,
- Quantify the regional irrigation system water available,
- Quantify the seawater potential available,
- Quantify the water storage potential available,
- Quantify the regional and local water retention available,
- Quantify the water potential available in reservoirs,
- Quantify the surface water potentially available,
- Reassess the Caloosahatchee hydrology, and
- Address MFLs.

Preservation 2000/Florida Forever

The Florida Forever program is the state's newest blueprint for the conservation of unique natural resources. It replaces the highly successful Preservation 2000 Program (P-2000), the largest program of its kind in the United States. P-2000 was responsible for the public acquisition and protection of more than 1.25 million acres of land.

The new program is more than an environmental land acquisition mechanism. It encompasses a wider range of goals, including the restoration of damaged environmental systems, water resource development and supply, increased public access, public lands management and maintenance, and the increased protection of land by acquisition of conservation easements.

Florida Forever authorizes bond issues in an amount not to exceed $3 billion over a 10-year period for the acquisition of land and water. This revenue is to be used for restoration, conservation, recreation, water resource development, historical preservation, and capital improvements on conservation lands. The money for Florida Forever, like the money that went into the P-2000 Program, comes from the sale of bonds that loan money to the state. The bonds are then paid back by revenues generated through an excise tax on recording certain documents (mostly real estate transactions) at the courthouse. When the sale of a house or a piece of property is recorded, the documentary stamp tax puts money into the fund that repays bonds issued under Florida Forever.

Proceeds from the bond issues are distributed annually from the Florida Forever Trust Fund as follows:

- Florida Department of Environmental Protection—38 percent ($114 million),
- Water Management Districts—35 percent ($105 million),
- Florida Communities Trust—24 percent ($72 million),
- Florida Department of Agriculture/Forestry—1.5 percent ($4.5 million), and
- Florida Fish and Wildlife Conservation Commission—1.5 percent ($4.5 million).

Since January 1999, more than 1 million acres of land have been acquired, including habitats for 103 state endangered species, 39 state threatened species, and 11 species of special concern.

Regional and Local Growth Management Activities

Each regional planning council in Florida is required to have a Strategic Regional Policy Plan, updated every five years, that contains an environmental component guiding local governmental planning. These policy plans are adopted by rule and receive their statutory guidance from Section 186.501, F.S. The counties comprising the Caloosahatchee Basin are contained within the Southwest Florida Regional Planning Council, the host and local sponsor of the CHNEP and the designated monitor of the Charlotte Harbor Resource Planning and Management Plan.

Each local government in Florida is required through Section 163, F.S., to have a Local Government Comprehensive Plan that is supported and implemented through land development regulations and capital improvement programs. Each local plan must include future land use and conservation elements, as well as stormwater management, water supply, and sewerage subelements. The local governments around Charlotte Harbor must also have coastal management elements. These plans, which are updated every five to seven years, must be consistent with regional and state comprehensive planning. Plans by all the local governments surrounding Charlotte Harbor are in compliance with state law.

Southwest Florida Feasibility Study

The Southwest Florida Feasibility Study (SWFFS), conducted by the USACOE and SFWMD, was born out of the C&SF Restudy's recommendations to Congress in July 1999. The Restudy, which only assessed water resource issues as they related to the Caloosahatchee Basin on the west coast, recognized that the hydrology of other watersheds in southwest Florida has not been comprehensively studied. Thus, it recommended a feasibility study to identify southwest Florida's water resource conditions and develop potential solutions to problems.

The study area includes all of Lee County, most of Collier and Hendry Counties, and portions of Charlotte, Glades, and Monroe Counties. It encompasses approximately 4,300 square miles and includes 2 major drainage basins. The northern boundary includes the Caloosahatchee River and corresponds to the jurisdictional boundary between the SFWMD and Southwest Florida Water Management District in Charlotte County. The eastern boundary delineates the divide between the Big Cypress Swamp and the Everglades system.

The study will determine the feasibility of making structural, nonstructural, and operational modifications and improvements in the region in the interest of environmental quality, water supply, and other purposes. It will develop a comprehensive regional plan of action to address the following:

- The health of aquatic and upland ecosystems;
- The quantity, quality, timing, and distribution of water flows;
- The agricultural, environmental, and urban water supply;
- The sustainability of economic and natural resources;
- Flood protection; and
- Fish and wildlife, biological diversity, and natural habitat.

The SWFFS will be accomplished in two phases. The first phase (scoping), paid for by the federal government, will quickly identify problems, opportunities, and potential solutions in the region. The second phase (feasibility), conducted with the SFWMD, will develop alternative solutions in more detail so that Congress can authorize and fund a viable plan.

Stakeholder Forums

Caloosahatchee River Citizens Association

The Caloosahatchee River Citizens Association is a group of citizen stakeholders who are interested in protecting the Caloosahatchee River. Their goals and objectives are as follows:

- To strive to improve the river from its source to its mouth, including its impacts on riparian and estuarine systems, wildlife habitat, and marine life;
- To promote public education on the historical significance, present condition, and future of the river and its watershed;
- To increase public awareness of the importance of the river to our quality of life;
- To study the effect of domestic, commercial, and agricultural uses on the river's resources;
- To monitor and work to improve the river's water quality, quantity, and flow characteristics; and
- To observe and participate in the activities of public bodies responsible for the management of the river and its watershed.

Charlotte Harbor National Estuary Program Management Conference

The CHNEP is a partnership of citizens, elected officials, resource managers, and commercial and recreational resource users collaborating to address diverse resource management concerns over the 4,400-square-mile watershed. The program is led by a director and a Management Conference of 4 committees (Policy, Management, Technical Advisory, and Citizen Advisory) and several technical subcommittees (Water Quality, Habitat Conservation, and Hydrologic Alterations). A cooperative decision-making process was used to produce a CCMP, outlining priority actions that should be taken to improve the water quality and ecological integrity of the greater Charlotte Harbor drainage basin, which includes the lower third of the Caloosahatchee Basin.

The CHNEP, as an umbrella group, has many participating entities currently managing or planning water quality improvements and/or ecosystem restoration and preservation projects in the basin that are not individually listed here.

Southwest Florida Watershed Council

Established in 2001, the Southwest Florida Watershed Council is a community-based effort to establish a watershed forum for the combined geographic area of the Everglades West Coast and Caloosahatchee Basins. Its mission is to "protect, conserve, manage, and/or restore the land and water resources of the Caloosahatchee and Big Cypress watersheds through participation and cooperation of all stakeholders in consensus building, planning, and decision making to meet the economic, natural, and cultural needs for this and succeeding generations." The council membership represents agency, academic, development, and environmental interests, as well as private citizens.

Chapter 3: Surface Water Quality Assessment

Scope of the Assessment

This chapter presents the results of an updated assessment of surface water quality in the Caloosahatchee Basin. The primary purpose of the assessment is to determine if waterbodies or waterbody segments are to be placed on the Verified List of impaired waterbodies. The listing will be in accordance with evaluation thresholds and data sufficiency and data quality requirements in the Identification of Impaired Surface Waters Rule (IWR) (Rule 62-303, Florida Administrative Code [F.A.C.]). The results of the assessment will be used to identify waters in the basin for which total maximum daily loads (TMDLs) will be developed.

The chapter describes the planning units in the basin used as a basis for the assessment. A section on each planning unit contains a general description and summary of key water quality indicators (such as nutrients, chlorophyll *a*, dissolved oxygen [DO], and microbiological parameters). Permitted discharges, land uses, ecological status, and water quality improvement plans and projects are summarized for each planning unit. The discussion notes where applicable surface water quality criteria have been exceeded and summarizes the report's findings in maps, noting potentially impaired waterbodies in each planning unit. The chapter also contains background information on sources of data and on designated use attainment, and explains the state's integrated water quality assessment process.

While potentially impaired waters and their causative pollutants are identified, it is not within the scope of this report to identify discrete sources of potential impairments. Information on the sources of impairment will be developed in subsequent phases of the watershed management cycle, including TMDL development and implementation.

Appendix A contains a discussion of the legislative and regulatory background for TMDL development and implementation. **Appendix C** provides additional information on reasonable assurance. **Appendix D** provides the methodology used to develop the Planning and Verified Lists. **Appendix E** contains, by planning unit, the water quality assessment (Master List) summary **(Table E.1)** and the water quality monitoring stations used in the assessment **(Table E.2)**. **Appendix F** lists, by planning unit, permitted wastewater treatment facilities in the basin that discharge to surface water and ground water, as well as hazardous waste sites, landfills, and brownfields. **Appendix G** lists Level I land use, by planning unit. The complete text of the IWR is available at http://www.dep.state.fl.us/water/tmdl/docs/amendedIWR.pdf.

Update on Strategic Monitoring and Data-Gathering Activities During Phase 2

During Phase 2 of the watershed management cycle, strategic monitoring and data-gathering activities focused first on waters on the 1998 303(d) list, followed by waters that were placed on the Planning List through the IWR assessment alone. The majority of the strategic monitoring work was conducted by the Florida Department of Environmental Protection's (Department) South District staff and included both chemical and biological monitoring and data upload to **STO**rage and **RET**rieval (STORET) databases. Data-gathering activities included working with environmental monitoring staff in the South Florida Water Management District (SFWMD) and local and county governments to obtain applicable monitoring data from their routine monitoring programs and special water quality projects in the basin.

Seventeen waterbody segments on the Planning List and the 1998 303(d) list needed further data to verify impairment. Parameters included copper, iron, lead, malathion, biological oxygen demand, DO, fecal and total coliforms, and nutrients (nitrogen, phosphorus, and chlorophyll *a*).

Twenty-two waterbody segments were verified impaired for at least one parameter in the Caloosahatchee Basin as the result of strategic monitoring and data-gathering activities in Phase 2. **Table E.1** in Appendix E provides the updated impairment status of the basin through June 30, 2004.

Sources of Data

The assessment of water quality in the Caloosahatchee Basin includes an analysis of quantitative data from various sources, some of which are readily available to the public. These sources include the U.S. Environmental Protection Agency's (EPA) Legacy and "new" STORET databases, the U.S. Geological Survey (USGS), and the Florida Department of Health (DOH). The STORET databases contain water quality data from a number of sources, including the Department, water management districts, local governments, and volunteer monitoring groups. **Appendix D** contains a detailed description of STORET and the methodology used to develop the Planning and Verified Lists, based on the IWR.

Table 3.1 summarizes the individual data providers who contributed to the IWR Database for the Caloosahatchee Basin for the period of record used in this assessment. **Figure 3.1** contains a pie chart showing the amount of data provided by each source.

Individual data providers who contributed to the IWR Database for the Caloosahatchee Basin during the period of record used in this assessment (January 1, 1997, and June 30, 2004) include the USGS, U.S. Army Corps of Engineers, the Department, DOH, SFWMD, Lee County Environmental Lab, and the city of Cape Coral.

In 2002, the Department created the IWR Database to evaluate data in accordance with the methodology prescribed in the Identification of IWR (Rule 62-303, F.A.C.). For the Planning List assessment, the data evaluation period of record is 10 years, and for the Verified List, 7.5 years.

Table 3.1: Data Providers in the Caloosahatchee Basin

Organization	Number of Water Quality Observations, 1997–2004
U.S. Army Corps of Engineers	143
Florida Department of Environmental Protection	15,731
Florida Department of Health	360
Lee County Environmental Lab	92,288
South Florida Water Management District	65,718
U.S. Geological Survey	6,747
Total	**180,987**

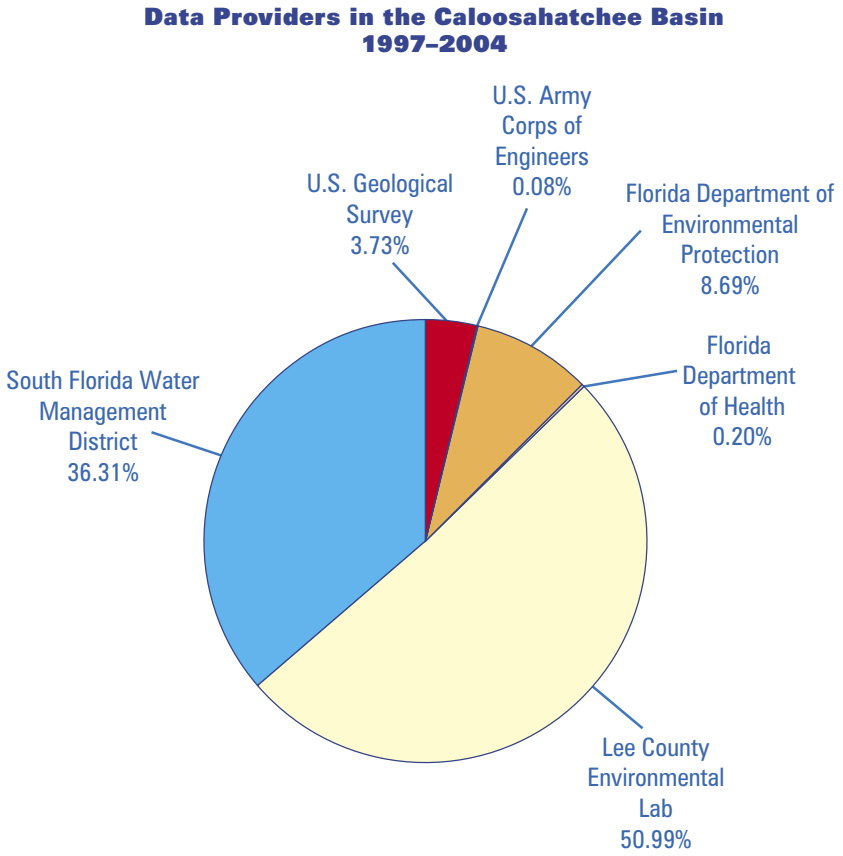


Figure 3.1: Sources of Data for the Caloosahatchee Basin

Table D.2 in Appendix D shows the periods of record for the Verified and Planning Lists in the first basin rotation cycle. Data collected between January 1, 1997, and June 30, 2004, were evaluated to establish the Verified List for the Caloosahatchee Basin (IWR Run 17.0).

To support listing decisions, the evaluation of water quality in this basin also includes qualitative information drawn from data in technical reports and documents that are not yet included in the database. Some of these sources include historical water quality or ecological information that was not uploaded to the database because of its qualitative treatment of issues.

Attainment of Designated Use

While the designated uses of a given waterbody are established using the surface water quality classification system described in Chapter 2, it is important to note that the EPA uses slightly different terminology in its description of designated uses. Because the Department is required to provide use attainment status for both the state's 305(b) report and the state's 303(d) list of impaired waters, the Department uses EPA terminology when assessing waters for use attainment. The water quality evaluations and decision processes that are defined in Florida's IWR for listing impaired waters are based on the following designated use attainment categories:

Aquatic Life Use Support-Based Attainment
Primary Contact and Recreation Attainment
Fish and Shellfish Consumption Attainment
Drinking Water Use Attainment
Protection of Human Health

Table 3.2 summarizes the designated uses assigned to Florida's various surface water classes.

Table 3.2: Designated Use Attainment Categories for Surface Waters in Florida

Designated Use Attainment Category Used in Impaired Surface Waters Rule Evaluation	Applicable Florida Surface Water Classification
Aquatic Life Use Support-Based Attainment	Class I, II, and III
Primary Contact and Recreation Attainment	Class I, II, and III
Fish and Shellfish Consumption Attainment	Class II
Drinking Water Use Attainment	Class I
Protection of Human Health	Class I, II, and III

Understanding the terms "Pollutant" and "Pollution"

For purposes of the TMDL Program, pollutants are chemical and biological constituents, introduced by humans into a waterbody, that may result in pollution (water quality impairment). There are other causes of pollution, such as physical alteration of a waterbody (for example, canals, dams, and ditches). However, TMDLs are established only for impairments caused by pollutants (a TMDL quantifies how much of a given pollutant a waterbody can receive and still meet its designated uses).

Waterbodies that are verified impaired due to specified pollutants, and therefore require a TMDL, are listed under Category 5 in the Integrated Assessment Report; waterbodies with water quality impairments due to other causes, or unknown causes, are listed under Category 4c. Although TMDLs are not established for Category 4c waterbodies, these waterbodies still may be addressed through a watershed management program (for example, the Kissimmee River restoration).

Integrated Report Categories and Assessment Overview

The EPA has requested that the states merge their reporting requirements under the Clean Water Act for Section 305(b) surface water quality reports and Section 303(d) lists of impaired waters into an *Integrated Water Quality Monitoring and Assessment Report* (Wayland, 2001). This Water Quality Assessment Report integrates the 303(d) list and the 305(b) report for the Caloosahatchee Basin.

Following the EPA's guidance, the Department delineated waterbodies or waterbody segments in each of the state's river basins, assessed them for impairment based on individual parameters, and then placed them into one of five major assessment categories and subcategories. These categories provide information on a waterbody's status based on water quality, sufficiency of data, and the need for TMDL development **(Table 3.3)**. This

Table 3.3: Categories for Waterbodies or Waterbody Segments in the 2002 Integrated Report

Category	Description	Comments
1	Attaining all designated uses	If use attainment is verified for a waterbody or segment that was previously listed as impaired, the Department will propose that it be delisted.
2	Attaining some designated uses and insufficient or no information or data are present to determine if remaining uses are attained	If attainment is verified for some designated uses of a waterbody or segment, the Department will propose partial delisting for the uses attained. Future monitoring will be recommended to determine if remaining uses are attained.
3a	No data and information are present to determine if any designated use is attained	Future monitoring will be recommended to determine if designated uses are attained.
3b	Some data and information are present but not enough to determine if any designated use is attained	Future monitoring will be recommended to gather sufficient information and data to determine if designated uses are attained.
3c	Enough data and information are present to determine that one or more designated uses may not be attained according to the Planning List methodology	A waterbody or segment is potentially impaired for one or more designated uses. These waters will be prioritized for future monitoring to verify use attainment or impaired status.
3d	Enough data and information are present to determine that one or more designated uses are not attained according to the Verified List methodology	A waterbody or segment exceeds Verified List evaluation criteria and may be listed as impaired at the end of Phase 2 of the watershed management cycle. However, the data have not yet been fully evaluated and the waters have not been formally verified as impaired. Further monitoring and analysis may be necessary. **NOTE:** This category is applicable only to the Status Report. Waters that pass the Verified List criteria at this stage of the process are placed in Category 5.
4a	Impaired for one or more designated uses but does not require TMDL development because a TMDL has already been completed	After the EPA approves a TMDL for the impaired waterbody or segment, it will be included in a Basin Management Action Plan (B-MAP) to reduce pollutant loading toward attainment of designated use(s).
4b	Impaired for one or more designated uses but does not require TMDL development because the water will attain water quality standards due to existing or proposed measures	Pollutant control mechanisms designed to attain applicable water quality standards within a reasonable time frame are either proposed or in place.
4c	Impaired for one or more criteria or designated uses but does not require TMDL development because impairment is not caused by a pollutant	This category includes waterbodies or segments that are impaired because of naturally occurring conditions or pollution. The impairment is not caused by specific pollutants. (See **sidebar** on previous page for a discussion of the difference between the terms "pollutant" and "pollution.")
5	One or more designated uses is not attained and a TMDL is required	Waterbodies or segments in this category are impaired for one or more designated uses by a pollutant or pollutants. Waters in this category are included on the basin-specific Verified List adopted by the Department's Secretary as Florida's impaired waters list and submitted to the EPA as Florida's 303(d) list of impaired waters at the end of Phase 2.

Note: The descriptions in **Table 3.3** are consistent with the EPA's integrated assessment categories. In the Status Reports for Groups 1 through 3 and in the Assessment Reports for Groups 1 through 2 that were previously produced, Categories 4b and 4c were reversed. That is, the description of Category 4b was previously listed as Category 4c, and the description of Category 4c was listed as Category 4b.

Assessment Report contains a comprehensive evaluation of waterbodies that fall into Integrated Report Categories 1 through 5 in the table.

Not enough recent data on chemistry, biology, and fish consumption advisories have been collected; therefore, currently only a few waterbodies or waterbody segments statewide fall into Category 1 (attaining all designated uses). In particular, fish tissues in many waterbodies statewide have not been tested for mercury. Out of 36 waterbodies or waterbody segments in the Caloosahatchee Basin, none are in Category 1.

More waterbodies and segments statewide fall into Category 2 (attaining some uses but with insufficient data to assess completely) than Category 1 (attaining all uses), because monitoring programs can sometimes provide sufficient data for partially determining whether a designated use in a particular waterbody is attained. Four waterbody segments in the basin fall into Category 2.

Most waterbodies in the state, however, fall into Category 3 (having insufficient data). In the Caloosahatchee Basin, the breakdown of waterbodies or segments in Category 3 is as follows:

- Category 3a—One segment for which no data are available to determine its water quality status;
- Category 3b—No segments with some data but not sufficient data for making any determinations; and
- Category 3c—Eight segments that are potentially impaired based on the Planning List criteria.

A number of waters either fail to meet water quality standards for DO or show signs of biological stress or nutrient impairment. According to the IWR, specific pollutants causing DO exceedances or biological stress, or an underlying nutrient imbalance creating an imbalance in flora or fauna, must be documented for a waterbody or segment to be listed as impaired. Sometimes these conditions cannot be linked to a causative pollutant, and sometimes they may reflect natural background conditions.

Currently, one waterbody in the basin is designated as being in Category 4. This category includes those waterbodies/segments that are impaired but do not require a TMDL for one of three reasons:

- Category 4a—Segments for which a TMDL has already been developed,
- Category 4b—Segments for which there is reasonable assurance that the designated use of an impaired waterbody will be attained by an existing or proposed pollutant control measure, and
- Category 4c—One segment for which the impairment is not attributable to a pollutant or pollutants, but is due to natural conditions or physical/hydrologic alterations to the waterbody.

Finally, 22 waterbodies in the basin are in Category 5. These impaired waterbodies are on the Verified List of impaired waters adopted by the Department's Secretary and will require TMDLs. Chapter 5 of this report discusses in detail the waters in this category.

Planning Units

The Caloosahatchee Basin encompasses approximately 1,406 square miles and a complex hydrologic system. To provide a more detailed geographic basis for identifying and assessing water quality improvement activities, the basin was subdivided into smaller areas called planning units. A planning unit is either an individual large tributary basin or a group of smaller adjacent tributary basins with similar characteristics. Planning units help organize information and management strategies around prominent watershed characteristics.

Water quality assessments were conducted for waterbody segments within planning units. Each of these smaller, hydrologically-based drainage areas within a planning unit is assigned a unique waterbody identification number (WBID). Waterbody segments are assessment units (or geographic information system [GIS] polygons) that the Department used to define waterbodies when it biennially inventoried and reported on water quality to the EPA under Section 305(b) of the federal Clean Water Act. These WBIDs are the assessment units identified in the Department's lists of impaired waters submitted to the EPA in reports under Section 303(d) of the Clean Water Act.

The Caloosahatchee Basin contains five planning units. From east to west, they are as follows:

- East Caloosahatchee
- West Caloosahatchee
- Telegraph Swamp
- Orange River
- Caloosahatchee Estuary

Table 3.4 describes these planning units, and **Figure 3.2** shows their locations and boundaries. The remainder of this chapter provides a general description of each planning unit, information on land use and potential point sources of pollution, water quality assessments for individual waterbody segments, and summaries of ecological issues and watershed quality improvement plans and projects.

Appendix E of this report provides an integrated water quality summary (the Master List) by planning unit and a list of water quality monitoring stations. **Appendix F** includes summary information, by planning unit, for permitted wastewater treatment facilities, hazardous waste sites, permitted landfill facilities, and brownfields. **Appendix G** lists Level I land uses, by planning unit.

Table 3.4: Planning Units in the Caloosahatchee Basin

Planning Unit	Description
East Caloosahatchee	446.4 square miles within Glades and Hendry Counties
West Caloosahatchee	508.2 square miles at the intersection of Glades, Hendry, Lee, and Charlotte Counties
Telegraph Swamp	90 square miles within Charlotte County and a small portion of Lee County
Orange River	104.2 square miles, wholly within Lee County
Caloosahatchee Estuary	256.9 square miles within Lee and Charlotte Counties
Total	**1,405.9 square miles**

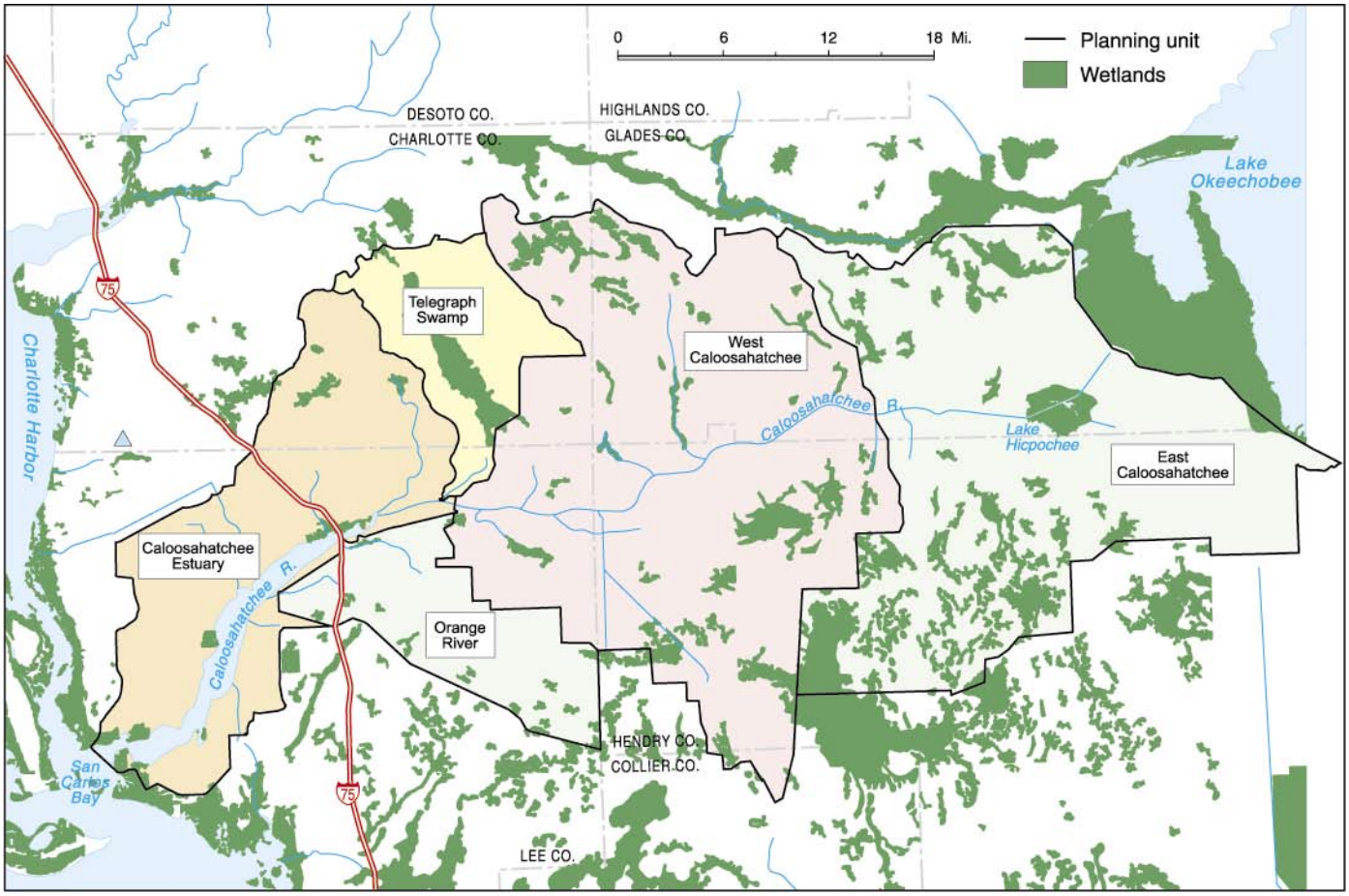


Figure 3.2: Locations and Boundaries of Planning Units in the Caloosahatchee Basin

Assessment by Planning Unit

- East Caloosahatchee Planning Unit

General Description

The 446-square-mile East Caloosahatchee Planning Unit, which lies within Glades and Hendry Counties, contains 5 segments with WBIDs. It includes the C-21 (S-4) Basin surrounding Clewiston, and the channelized Caloosahatchee River from Lake Okeechobee at Moore Haven Lock, westward to Ortona Lock. Other significant waterbodies in the planning unit include Lake Hicpochee, Ninemile Canal, C-19 Canal, Nicodemus Slough, Long Hammock Creek, Linden Pens Marsh, Okaloacoochee Slough, and numerous smaller agricultural and drainage canals and ditches. Communities in the planning unit include the cities of Clewiston and Moore Haven and the town of Ortona.

This is the most heavily farmed planning unit in the Caloosahatchee Basin, and sugarcane, ranching, and citrus are the dominant agricultural activities. The most important water use in the planning unit is crop irrigation, and an extensive network of canals in the area recharges the water table and drains away potential floodwaters. The drainage system in the planning unit is more intricate than in the adjoining West Caloosahatchee Planning Unit.

Significant natural areas in the East Caloosahatchee Planning Unit include the Okaloacoochee Slough Wildlife Management Area, at 2,923 acres, and the Okaloacoochee Slough State Forest and Wildlife Management Area, at 32,039 acres. The former is wholly within the planning unit, while the latter straddles this and the Everglades West Coast Basin.

Water Quality Summary

The major water quality problems in the East Caloosahatchee Planning Unit are low DO and elevated metals, which could be a consequence of agricultural activity in the region. Low DO can also be caused by naturally low background oxygen levels in canals. Most of the water quality monitoring stations in the planning unit are on the Caloosahatchee River, Lake Hicpochee, or the primary canals draining the agricultural areas.

Figure 3.3, a composite map of the planning unit, shows waters on the 1998 303(d) list, the Planning List and Verified List, and potential pollution sources. **Table 3.5** summarizes the water quality assessment status of all waterbody segments in the planning unit.

Permitted Discharges and Land Uses

Point Sources. The planning unit has 17 permitted nonsurface water discharges, 2 permitted surface water discharges, and no Superfund or state-funded hazardous waste sites. It contains 2 active and 2 inactive Class I solid waste landfills (see **Noteworthy** for a definition of point sources). The permitted point sources include 11 sewage treatment plants, 2 sand/rock mines, 2 citrus-processing plants, 1 concrete batch plant, and 1 sugar-processing plant.

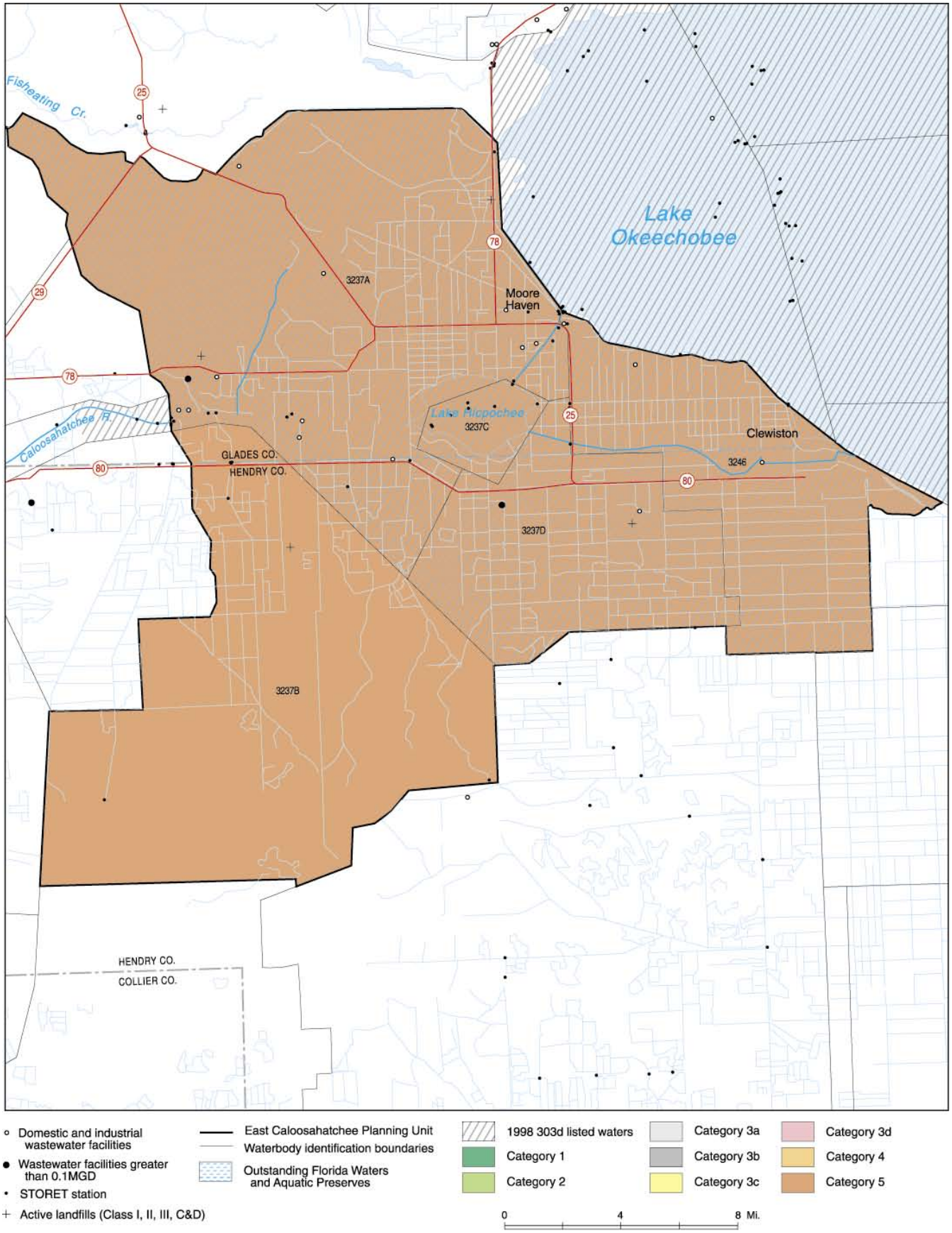


Figure 3.3: Composite Map of the East Caloosahatchee Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources

Table 3.5: Integrated Water Quality Assessment Summary for the East Caloosahatchee Planning Unit

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters[4]	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters[5]	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[6]
3237A	East Caloosahatchee	Stream	IIIF	BOD 5-Day, DO, Nutrients	BOD 5-Day, DO, Nutrients (Chlorophyll *a*)	Iron	Alkalinity, Conductance, Mercury in Fish, pH, Turbidity, Zinc, Lead, Fecal Coliforms, Copper, Total Coliforms, Unionized Ammonia, Cadmium, Arsenic	5
3237B	Long Hammock Creek	Stream	IIIF	—	Lead	Nutrients (Chlorophyll *a*), DO	Alkalinity, Conductance, pH, Turbidity, Fecal Coliforms, Total Coliforms	5
3237C	Lake Hicpochee	Lake	IIIF	Nutrients	DO, Nutrients (Chlorophyll *a*)	Lead, Total Coliforms	Alkalinity, Conductance, Chromium 3, Arsenic, Copper, Fecal Coliforms, pH, Turbidity, Zinc	5
3237D	Ninemile Canal	Stream	IIIF	Nutrients, Coliforms, BOD, DO	DO	Fecal Coliforms, Lead	Alkalinity, Conductance, pH, Turbidity, Iron, Arsenic, Copper, Nutrients (Chlorophyll *a*), Zinc, Total Coliforms, Chromium 3	5
3246	C-21	Stream	IIIF	DO, Nutrients (Chlorophyll *a*)	DO, Nutrients (Chlorophyll *a*)	Iron	Alkalinity, Arsenic, Cadmium, Conductance, Lead, Mercury in Fish, pH, Turbidity, Unionized Ammonia, Zinc	5

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:

Class I: **Potable water supplies**
Class II: **Shellfish propagation or harvesting**
Class III: **Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife**
Class IV: **Agricultural water supplies**
Class V: **Navigation, utility, and industrial use (there are no state waters currently in this class)**

Table 3.5 (continued)

[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:
- **1**—Attains all designated uses;
- **2**—Attains some designated uses;
- **3a**—No data and information are available to determine if any designated use is attained;
- **3b**—Some data and information are available, but they are insufficient for determining if any designated use is attained;
- **3c**—Meets Planning List criteria and is potentially impaired for one or more designated uses;
- **3d**—Meets Verified List criteria and is potentially impaired for one or more designated uses;
- **4a**—Impaired for one or more designated uses and the TMDL is complete;
- **4b**—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollutant control mechanism provides reasonable assurance that the water will attain standards in the future;
- **4c**—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
- **5**—Water quality standards are not attained and a TMDL is required.

[4]Parameters in **bold** meet the Verified List evaluation criteria, Section 62-303.400, F.A.C.
[5]Parameters in *italics* are in Category 4 (a, b, or c) waters that do not require TMDL development.
[6]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

BOD = Biological oxygen demand
DO = Dissolved oxygen
F = Fresh water

Appendix F lists the basin's domestic and industrial surface discharge facilities, along with their permitted flows, by planning unit. It also lists landfills or solid waste facilities, by planning unit.

Nonpoint Sources. Based on Level I land use summary information from the SFWMD's 1998 GIS data, agriculture comprises about 63 percent of land use in the planning unit. This land use can be associated with nonpoint discharges of pollutants and eroded sediments. Citrus is grown south of the Caloosahatchee River, and pasture is widely distributed throughout the planning unit (Tetra Tech and Janicki Environmental, Inc., 2002). The Caloosahatchee Water Management Plan reports that in 1995 an estimated 75,000 acres of sugarcane were produced near Lake Okeechobee, where transportation costs to the mills could be minimized (SFWMD, 2000a). Total sugarcane acreage in the region has increased and will continue to increase (SFWMD, 2000a). **Appendix G** provides summary information on Level I land uses in the basin, by planning unit.

Ecological Summary

The Okaloacoochee Slough, a significant natural wetland system on the southern edge of the planning unit, straddles the Caloosahatchee and Everglades West Coast Basins in Hendry and Collier Counties. The Okaloacoochee Slough flows in two separate directions, both northward towards the Caloosahatchee River and southward into Collier County. The Okaloacoochee Slough is also the major headwater for the Fakahatchee Strand and the Big Cypress National Preserve. This slough system is composed largely of herbaceous plants, with trees and shrubs scattered along its fringes and central portions. Its extensive network of sloughs and isolated wetlands stores wet-season runoff from the surrounding uplands and provides year-round base flow to downstream natural areas.

Information on Point Sources in Planning Units

Point sources discharging pollutants to surface water or ground water originate from discrete, well-defined areas such as a facility discharge from the end of a pipe, a disposal well, or a wastewater sprayfield. Point sources generally fall into two major types: domestic wastewater sources (which consist of sewage from homes, businesses, and institutions) and industrial wastewater sources (which include wastewater, runoff, and leachate from industrial or commercial storage, handling, or processing facilities). Landfills, hazardous waste sites, dry cleaning solvent cleanup program sites, and petroleum facility discharges are also considered point sources. These sites have the potential to leach contaminants into ground water and surface water.

Identifying the source of waterbody impairment is an important part of assessing water quality and developing TMDLs. As part of this report, information is presented on point sources, including permitted facilities that discharge wastewater and landfills.

Nonpoint Sources and Land Uses

Rainfall generates stormwater runoff. As it flows over the land and through the ground, runoff may carry nonpoint source pollutants from many different sources to lakes, rivers, and estuaries in a watershed, and into ground water supplies. Nonpoint sources also include atmospheric deposition and leaching from agricultural lands, urban areas, and unvegetated lands. The pollutants in runoff often include fertilizers, bacteria, metals, sediments, and petroleum compounds.

The Okaloacoochee Slough system provides habitat for a variety of wildlife and has been identified as "Priority 1 Habitat" for Florida panther protection by the U.S. Fish and Wildlife Service (USFWS). The USFWS defines "Priority 1 Habitat" areas as lands most frequently used by the panther and/or lands of high-quality native habitat suitable for the panther that should be preserved (SFWMD, 2000a). The Department has been very active in purchasing/preserving property in the Okaloacoochee Slough system.

Fish Consumption Advisories

A fish consumption advisory for mercury is listed for the L-1 Canal on the eastern edge of the East Caloosahatchee Planning Unit. This is a limited consumption advisory for largemouth bass, bowfin, gar, and warmouth.

Water Quality Improvement Plans and Projects

Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix C** contain additional information on the requirements for reasonable assurance.

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the list of impaired waters.

• West Caloosahatchee Planning Unit

General Description

The 508-square-mile West Caloosahatchee Planning Unit, which lies at the intersection of Glades, Hendry, Lee, and Charlotte Counties, contains 14 segments with WBIDs. It includes the channelized Caloosahatchee River from Ortona Lock, westward to Franklin Lock and Dam. Other named waterbodies in the planning unit include the following:

- Deadmans, Banana, Jack's, Fort Simmons, and Bee Branches;
- Pollywog, Spanish, Cypress, Hickey, and Bedman Creeks;
- Twelve Mile Slough;
- Roberts, Townsend, George, How, King, Fox, West Easy, East Easy, West Baker, East Baker, and Hickey Creek Canals; and
- Hickey Creek Swamp.

In addition to the named waterbodies, 35 side channels, or oxbows, of various sizes and geomorphic configurations are found along the channelized Caloosahatchee River from the town of \ downstream to the W. P. Franklin Lock and Dam. The ecological condition of these oxbows varies from reasonably good in those few with significant flow-through, to very poor in those where flow is restricted or blocked and significant quantities

of organically rich sediments have accumulated (SFWMD, 2000a). The city of LaBelle is in this planning unit.

Major natural areas in the West Caloosahatchee Planning Unit include a portion of the privately held 90,000-acre Babcock Crescent B Ranch and the following publicly owned lands:

- Caloosahatchee Ecoscape Conservation and Recreational Lands Project (12,664 acres),
- Hickey Creek Mitigation Park Wildlife and Environmental Area (936 acres),
- Caloosahatchee Regional Park (768 acres),
- Greenbriar Swamp Preserve (176 acres),
- Moya Sanctuary (120 acres),
- Hickey Creek Mitigation Park/Greenbriar Swamp Preserve Connector (61 acres), and
- Caloosahatchee River-Hickey Creek Connector (42 acres).

Water Quality Summary

The major water quality problems in the planning unit appear to be low DO, coliform bacteria, heavy metals, and nutrients, which could be a consequence of agricultural activity in the region. Low DO can also be caused by naturally low background oxygen levels in creeks and canals. **Figure 3.4**, a composite map of the planning unit, shows waters on the 1998 303(d) list, the Planning List and Verified List, and potential pollution sources. **Table 3.6** summarizes the water quality assessment status of all waterbody segments in the planning unit.

Permitted Discharges and Land Uses

Point Sources. The planning unit has 20 permitted nonsurface water discharges, no permitted surface water discharges, no Superfund, and 1 state-funded hazardous waste site. The permitted point sources include 15 sewage treatment plants, 1 citrus-processing plant, 1 citrus-packing plant, 1 commercial nursery, 1 concrete batch plant, and 1 industrial stormwater with no exposure. There are also 2 inactive Class I solid waste landfills.

Appendix F lists the basin's domestic and industrial surface discharge facilities, along with their permitted flows, by planning unit. It also lists landfills or solid waste facilities, by planning unit.

Nonpoint Sources. Based on Level I land use summary information from the SFWMD's 1998 GIS data, agriculture is the dominant land use in the planning unit, with citrus and ranching the prevalent types in the region. The planning unit also contains the city of LaBelle.

Land use in the West Caloosahatchee Planning Unit that could contribute to nonpoint pollution impacts are agricultural, rangeland, and urban at 46 percent, 8 percent, and 7 percent of the planning unit, respectively. Citrus is grown on both sides of the Caloosahatchee River, and

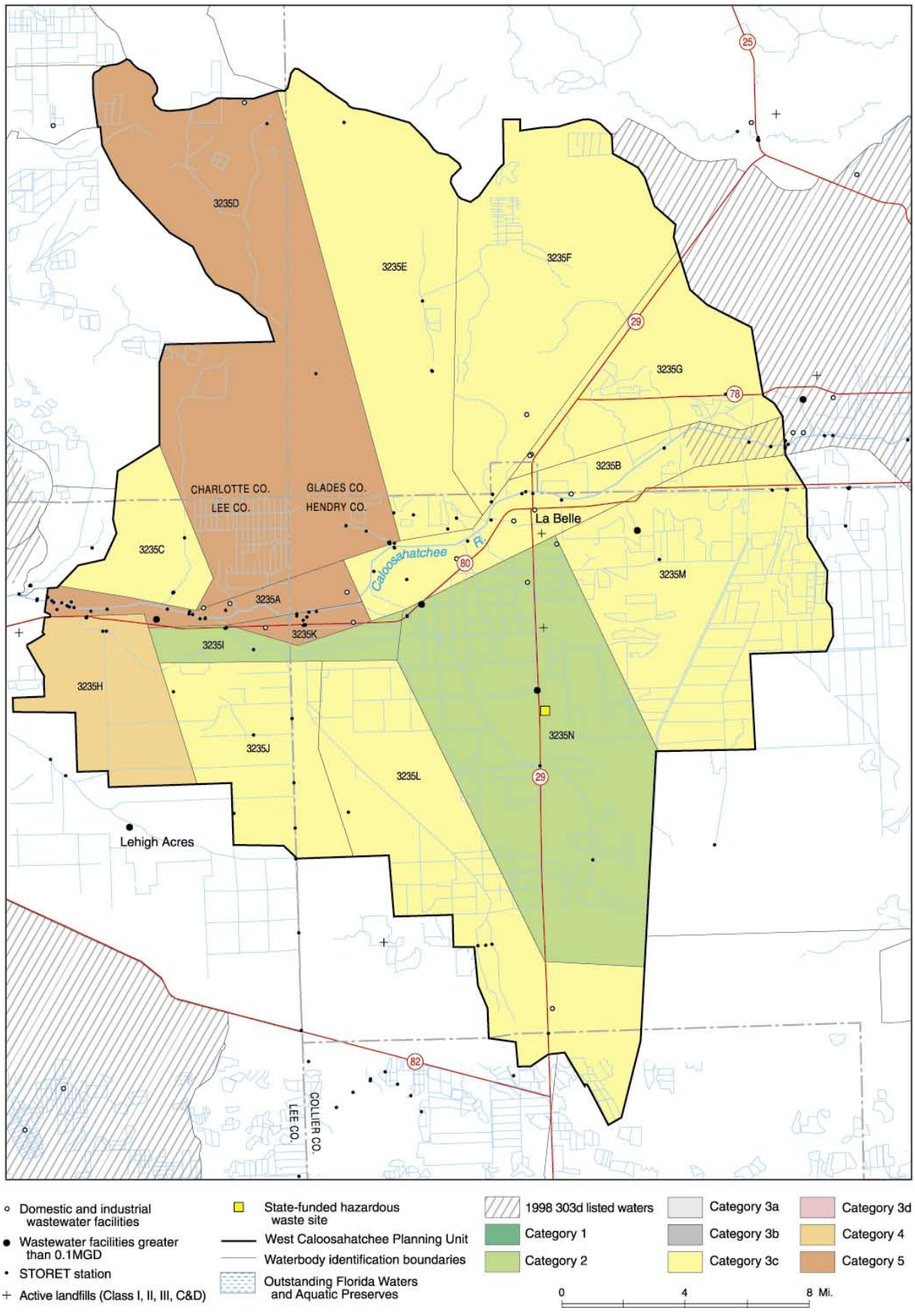


Figure 3.4: Composite Map of the West Caloosahatchee Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources

Table 3.6: Integrated Water Quality Assessment Summary for the West Caloosahatchee Planning Unit

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters[4]	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters[5]	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[6]
3235A	West Caloosahatchee	Stream	I	—	—	Iron, Lead, DO	Arsenic, Alkalinity, Conductance, Dissolved Solids, Nutrients (Chlorophyll *a*), Chromium 3, Chloride, Copper, Fecal Coliforms, Nitrate, pH, Total Coliforms, Turbidity, Zinc, Unionized Ammonia	5
3235B	West Caloosahatchee	Stream	IIIF	—	DO	—	Alkalinity, Conductance, Fecal Coliforms, Nutrients (Chlorophyll *a*), pH, Total Coliforms, Turbidity	3c
3235C	Cypress Creek	Stream	IIIF	—	DO, Fecal Coliforms	—	—	3c
3235D	Jacks Branch	Stream	IIIF	—	Lead	Nutrients (Chlorophyll *a*)	Alkalinity, Conductance, Fecal Coliforms, pH, Total Coliforms, Turbidity	5
3235E	Bee Branch	Stream	IIIF	—	Copper, DO, Fecal Coliforms, Lead	—	Conductance, pH, Turbidity	3c
3235F	Pollywog Creek	Stream	IIIF	—	Lead, Alkalinity, Total Coliforms, DO, Fecal Coliforms, Iron	—	Nutrients (Chlorophyll *a*)	3c
3235G	Cypress Branch	Stream	IIIF	—	DO, Iron	—	Biology	3c
3235H	Hickey Creek	Stream	IIIF	—	—	DO	Nutrients (Chlorophyll *a*), Conductance, pH, Turbidity, Copper, Zinc, Lead, Arsenic, Fecal Coliforms	4c

Table 3.6 (continued)

WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
					Potentially Impaired (Cat. 3c) for Listed Parameters[4]	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters[5]	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/303(d) Integrated Report Assessment Category for WBID[6]
3235I	Bedman Creek	Stream	IIIF	—	—	—	Lead, Biology, DO, Arsenic, Fecal Coliforms, Conductance, pH, Turbidity, Copper, Zinc, Nutrients (Chlorophyll *a*)	2
3235J	Dog Canal	Stream	IIIF	—	Copper, DO, Lead	—	—	3c
3235K	Townsend Canal	Stream	IIIF	—	DO	Copper, Lead	Alkalinity, Conductance, Fecal Coliforms, Total Coliforms, Nutrients (Chlorophyll *a*), Iron, Chromium 3, pH, Turbidity, Zinc, Arsenic	5
3235L	Townsend Canal	Stream	IIIF	—	Copper, DO, Lead	—	—	3c
3235M	Goodno Canal	Stream	IIIF	—	Fecal Coliforms, Iron, DO	—	Nutrients (Chlorophyll *a*), Biology	3c
3235N	Roberts Canal	Stream	IIIF	—	—	—	Iron, Fecal Coliforms, Nutrients (Chlorophyll *a*), Total Coliforms	2

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:

Class I: **Potable water supplies**
Class II: **Shellfish propagation or harvesting**
Class III: **Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife**
Class IV: **Agricultural water supplies**
Class V: **Navigation, utility, and industrial use (there are no state waters currently in this class)**

[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:

1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
3d—Meets Verified List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollutant control mechanism provides reasonable assurance that the water will attain standards in the future;
4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.

Table 3.6 (continued)

[4]Parameters in **bold** meet the Verified List evaluation criteria, Section 62-303.400, F.A.C.
[5]Parameters in *italics* are in Category 4 (a, b, or c) waters that do not require TMDL development.
[6]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

DO = Dissolved oxygen
F = Fresh water

pasture is widely distributed throughout the planning unit (Tetra Tech et al., 2002). These land uses can be associated with nonpoint discharges of pollutants and eroded sediments. **Appendix G** provides summary information on Level I land uses in the basin, by planning unit

Ecological Summary

Twelve Mile Slough, a significant natural wetland system south of the Caloosahatchee River, covers 3,300 acres and contains a mosaic of freshwater wetlands, as well as pine flatwoods and oak/cabbage palm hammocks. Surface water storage in the numerous wetlands provides for ground water recharge of the underlying surficial aquifer and provides surface water supply to the Caloosahatchee River (SFWMD, 2000a). Twelve Mile Slough is a tributary to the much larger and regionally significant Okaloacoochee Slough, found in the East Caloosahatchee Planning Unit. The Department has been very active in purchasing/preserving property in the Twelve Mile and Okaloacoochee Sloughs.

The USFWS has identified much of the planning unit north of the Caloosahatchee River, and the Twelve Mile Slough south of the river, as "Priority 1 Habitat" for Florida panther protection. The USFWS defines "Priority 1 Habitat" areas as lands most frequently used by the panther and/or lands of high-quality native habitat suitable for the panther that should be preserved (SFWMD, 2000a).

Fish Consumption Advisories

No fish consumption advisories are listed for the West Caloosahatchee Planning Unit.

Water Quality Improvement Plans and Projects

Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix C** contain additional information on the requirements for reasonable assurance.

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the list of impaired waters.

• Telegraph Swamp Planning Unit

General Description

The 90-square-mile Telegraph Swamp Planning Unit, which lies within Charlotte County and a small portion of Lee County, contains two segments with WBIDs. Significant waterbodies include Telegraph Swamp, Telegraph Creek, tributary creeks, and numerous smaller agricultural or drainage canals and ditches. The planning unit drains directly into the Caloosahatchee Estuary downstream of the Franklin Lock. Much of the region is in a natural state, with pine forests and cypress wetlands predominating. Some ranching also is present in the region. No named communities are found in the planning unit.

Significant natural areas include a small portion of the 78,077-acre Fred C. Babcock–Cecil Webb Wildlife Management Area and the privately held Babcock Crescent B Ranch. At 90,000 acres (including the 10,000-acre Telegraph Cypress Swamp), the ranch encompasses most of the planning unit. The state has been in continual discussions with the Babcock Company over the acquisition of the Babcock Ranch lands for conservation purposes (Martin, 2005).

Water Quality Summary

The planning unit remains largely in a natural state. Of the two WBIDs in the planning unit, only one has sufficient water quality data for assessment purposes. **Figure 3.5**, a composite map of the planning unit, shows waters on the 1998 303(d) list and the Planning List, as well as potential pollution sources. **Table 3.7** summarizes the water quality assessment status of the waterbody segments in the planning unit. The table and figure indicate that no waterbody segments in the planning unit are impaired.

Permitted Discharges and Land Uses

Point Sources. The planning unit contains no permitted nonsurface water or surface water discharges, no Superfund or state-funded hazardous waste sites, and no Class I solid waste landfills.

Appendix F lists the basin's domestic and industrial surface discharge facilities, along with their permitted flows, by planning unit. It also lists landfills or solid waste facilities, by planning unit.

Nonpoint Sources. The planning unit is sparsely settled, with no population centers. Based on Level I land use summary information from the SFWMD's 1998 GIS data, upland forest and wetlands are the prevalent land use types in the region, at 47 and 24 percent, respectively. Agriculture and rangeland, which together encompass 28 percent of land use in the region, can be associated with nonpoint discharges of pollutants and eroded sediments. **Appendix G** provides summary information on Level I land uses in the basin, by planning unit.

Ecological Summary

The Telegraph Swamp Planning Unit is a diverse system with a mixture of hydric (pine) flatwoods, cypress strands, marshes, oak hammocks, and pastures. The Florida Fish and Wildlife Conservation Commission

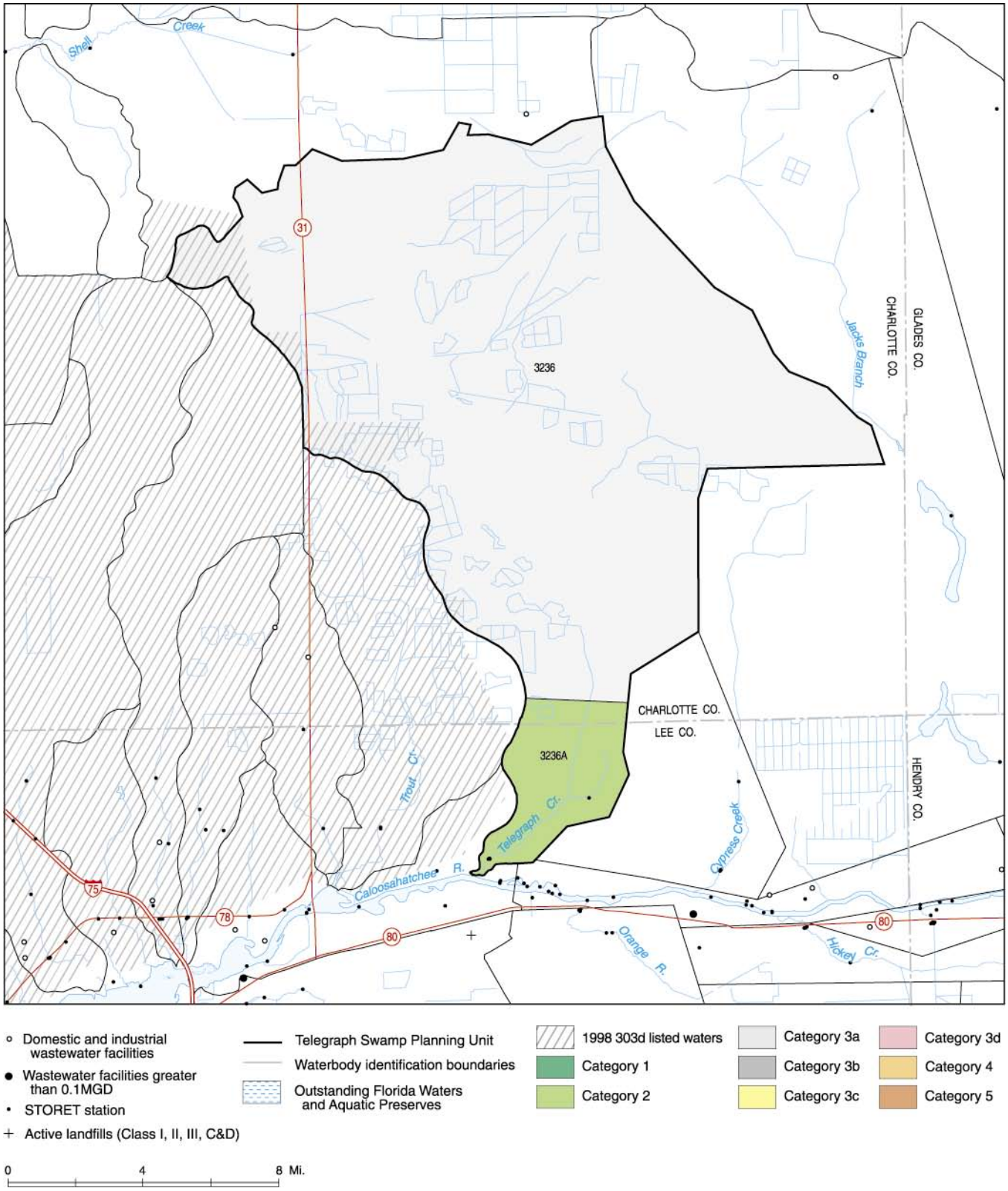


Figure 3.5: Composite Map of the Telegraph Swamp Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources

Table 3.7: Integrated Water Quality Assessment Summary for the Telegraph Swamp Planning Unit

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters[4]	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters[5]	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/303(d) Integrated Report Assessment Category for WBID[6]
3236	Telegraph Swamp	Stream	IIIF	—	No Data	No Data	No Data	3a
3236A	Telegraph Creek	Stream	IIIF	—	—	—	DO, Conductance, pH, Unionized Ammonia, Nutrients (Chlorophyll *a*), Biology, Copper, Fecal Coliforms, Arsenic, Lead, Zinc	2

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:
Class I: Potable water supplies
Class II: Shellfish propagation or harvesting
Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
Class IV: Agricultural water supplies
Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)
[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:
1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
3d—Meets Verified List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollutant control mechanism provides reasonable assurance that the water will attain standards in the future;
4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.
[4]Parameters in **bold** meet the Verified List evaluation criteria, Section 62-303.400, F.A.C.
[5]Parameters in *italics* are in Category 4 (a, b, or c) waters that do not require TMDL development.
[6]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

DO = Dissolved oxygen
F = Fresh water

has listed most of the planning unit as a Strategic Conservation Area for the Florida panther, and the USFWS has identified it as "Priority 1 Habitat" for Florida panther protection. The USFWS defines "Priority 1 Habitat" areas as lands most frequently used by the panther and/or lands of high-quality native habitat suitable for the panther that should be preserved (SFWMD, 2000a).

Fish Consumption Advisories

No fish consumption advisories are listed for the Telegraph Swamp Planning Unit.

Water Quality Improvement Plans and Projects

Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix C** contain additional information on the requirements for reasonable assurance.

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the list of impaired waters.

• Orange River Planning Unit

General Description

The 104-square-mile Orange River Planning Unit, which lies wholly within Lee County, contains two WBIDs. Waterbodies in the planning unit include Orange River, Able Canal, Halfway Pond, Billy Creek, and numerous residential and agricultural drainage canals and ditches. The Orange River itself drains directly into the Caloosahatchee Estuary downstream of the Franklin Lock.

Natural areas in the planning unit include the Orange River Islands Sanctuary (10 acres), which consists of mangrove islands in the Orange River, north of State Road 80. The region also contains the communities of Lehigh Acres, Buckingham, East Fort Myers, Tice, and Fort Myers.

Water Quality Summary

The major water quality problems in the planning unit include low DO and coliform bacteria. The observed water quality violations are probably linked to urban land uses in the planning unit.

Figure 3.6, a composite map of the planning unit, depicts waters on the 1998 303(d) list, the Planning List and Verified List, and potential pollution sources. **Table 3.8** summarizes the water quality assessment status of all waterbody segments in the planning unit. The table and figure show that one waterbody segment in the planning unit is impaired.

Permitted Discharges and Land Uses

Point Sources. The planning unit contains 8 permitted nonsurface water discharges, 2 permitted surface water discharges, and no Superfund or state-funded hazardous waste site. Permitted point sources include 3 sewage treatment plants and 1 electric generating plant. There are also 1 inactive and 1 closed Class I solid waste landfill, 1 inactive construction and debris landfill, and 1 brownfield.

Appendix F lists the basin's domestic and industrial surface discharge facilities, along with their permitted flows, by planning unit. It also lists landfills or solid waste facilities and brownfields, by planning unit.

Nonpoint Sources. Based on Level I land use summary information from the SFWMD's 1998 GIS data, the prevalent land use types in the region are urban and agricultural, at 60 percent and 11 percent of the planning unit, respectively. Agricultural and urban land uses can be associated with nonpoint discharges of pollutants and eroded sediments. The

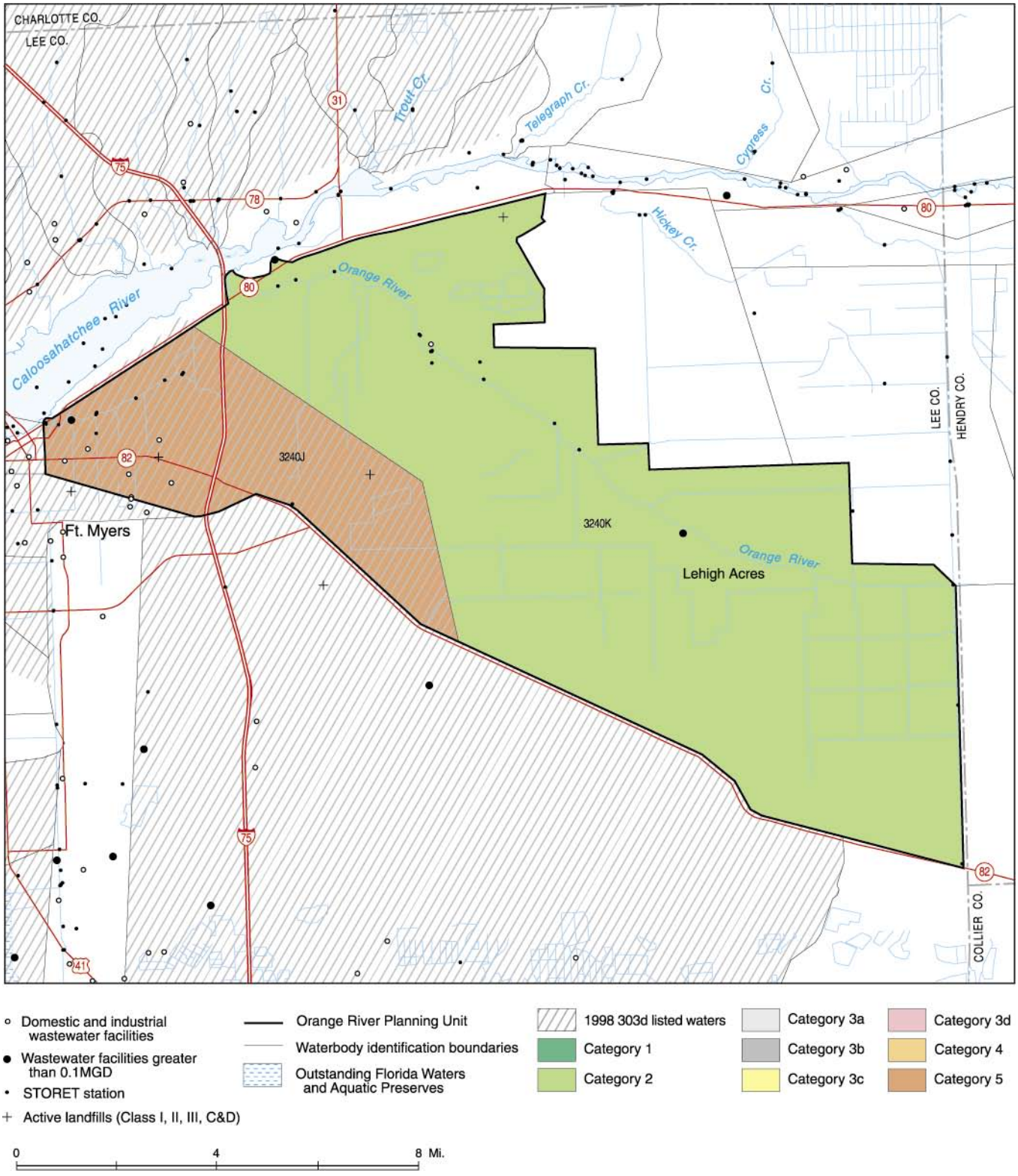


Figure 3.6: Composite Map of the Orange River Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources

Table 3.8: Integrated Water Quality Assessment Summary for the Orange River Planning Unit

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters[4]	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters[5]	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[6]
3240J	Billy Creek	Estuary	IIIM	Nutrients, DO	—	DO, Fecal Coliforms	Zinc, Biology, Nutrients (Chlorophyll *a*), Lead, Arsenic, Copper, pH, Turbidity	5
3240K	Orange River	Stream	IIIF	—	—	—	Conductance, pH, Turbidity, Lead, Biology, Nutrients (Chlorophyll *a*), Fecal Coliforms, Copper, Unionized Ammonia, DO, Zinc, Arsenic	2

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:
Class I: Potable water supplies
Class II: Shellfish propagation or harvesting
Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
Class IV: Agricultural water supplies
Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)
[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:
1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
3d—Meets Verified List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollutant control mechanism provides reasonable assurance that the water will attain standards in the future;
4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.
[4]Parameters in **bold** meet the Verified List evaluation criteria, Section 62-303.400, F.A.C.
[5]Parameters in *italics* are in Category 4 (a, b, or c) waters that do not require TMDL development.
[6]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

DO = Dissolved oxygen
F = Fresh water
M = Marine

largest growth area is the unincorporated community of Lehigh Acres, which encompasses most of the drainage watershed of the Orange River. **Appendix G** provides summary information on Level I land uses in the basin, by planning unit.

Ecological Summary

Although the planning unit is highly urbanized, the "urban" category also includes undeveloped lands in urban areas and inactive subdivisions with street patterns and no structures. Using a more detailed Level III land use analysis, about 44 percent of the urban lands identified in the planning unit are actually undeveloped (see the section on **"Residential Development and 'Roads to Nowhere'"** in Chapter 2).

Fish Consumption Advisories

No fish consumption advisories are listed for the Orange River Planning Unit.

Water Quality Improvement Plans and Projects

Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix C** contain additional information on the requirements for reasonable assurance.

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the list of impaired waters.

• Caloosahatchee Estuary Planning Unit

General Description

The 257-square-mile Caloosahatchee Estuary Planning Unit, which lies within Lee and Charlotte Counties, contains 13 WBIDs. Waterbodies in the planning unit include the Caloosahatchee River and Estuary; Hancock, Yellow Fever, Daughtrey, Popash, Stroud, Owl, and Trout Creeks; and numerous residential canals and drainage ditches. The principal communities are Fort Myers, Fort Myers Shores, North Fort Myers, and Cape Coral.

Significant natural areas in the planning unit include a portion of the 90,000-acre, privately held Babcock Crescent B Ranch and the following publicly owned lands:

- Fred C. Babcock–Cecil Webb Wildlife Management Area (a portion of 78,077 acres),
- Cape Coral Ecopark (354 acres), and
- Caloosahatchee National Wildlife Refuge (40 acres).

The Caloosahatchee Estuary is a large system (26 miles long) where the waters of the Gulf of Mexico mix with the freshwater inflows from the

river, sloughs, and overland sheet flows in the basin. The lower reaches are characterized by a shallow bay, extensive seagrass beds, and sand flats. Large mangrove forests dominate undeveloped areas of the shoreline.

Because of the irregular, long, slender shape of the system, slight changes in wind, tide, runoff, or precipitation can have dramatic effects on estuarine features such as flow, water depth, salinity, and turbidity, making characterization of the system difficult (SFWMD, 2000a). In particular, large, unnatural freshwater releases from Lake Okeechobee through the C-43 Canal have affected the Caloosahatchee Estuary (see the section on **"Hydrologic Alterations—'Famine or Feast'"** in Chapter 2).

On February 13, 2003, the Caloosahatchee Estuary, as part of lower Charlotte Harbor, was designated as a Surface Water Improvement and Management priority waterbody by the Governing Board of the SFWMD. Although adjacent to the cities of Cape Coral and Fort Myers, the estuary still provides critical habitat to fish and wildlife that requires careful management (Charlotte Harbor National Estuary Program, 2000a). Despite the accumulated damage to the estuary, seagrasses still flourish when river conditions are suitable. The estuarine Caloosahatchee serves as an important center of abundance in Florida for the manatee (SFWMD, 2000a).

Water Quality Summary

There are 13 WBIDs in the planning unit, all of which were found to be verified impaired. The problems included low DO, high copper and lead, coliform bacteria, and nutrients such as chlorophyll *a*. The Caloosahatchee Estuary receives pollutants transported downstream from the previous 4 planning units and water releases from Lake Okeechobee; it also has water quality problems from its own sources of pollution (urban land uses and poorly flushed residential canals).

Figure 3.7, a composite map of the planning unit, depicts waters on the 1998 303(d) list, the Planning List and Verified List, and potential pollution sources. **Table 3.9** summarizes the water quality assessment status of all waterbody segments in the planning unit.

Permitted Discharges and Land Uses

Point Sources. The planning unit contains 28 permitted nonsurface water discharges, 4 permitted surface water discharges, no Superfund, and 1 state-funded hazardous waste site. Permitted point sources include 19 sewage treatment plants, 2 rock mines or plants, 3 concrete batch plants, and 7 industrial stormwater sources with no exposure. There is also 1 closed Class I solid waste landfill and 2 brownfields.

Appendix F lists the basin's domestic and industrial surface discharge facilities, along with their permitted flows, by planning unit. It also lists landfills or solid waste facilities and brownfields by planning unit.

Nonpoint Sources. With urban land use comprising 40 percent of the planning unit, a likely origin for nonpoint source pollution is stormwater runoff from the communities of Cape Coral, Fort Myers, and North Fort Myers. Since this planning unit is the receiving basin for all other upstream basins, a significant amount of nonpoint source pollution can also come from upstream sources (Lake Okeechobee, the upper Caloosahatchee

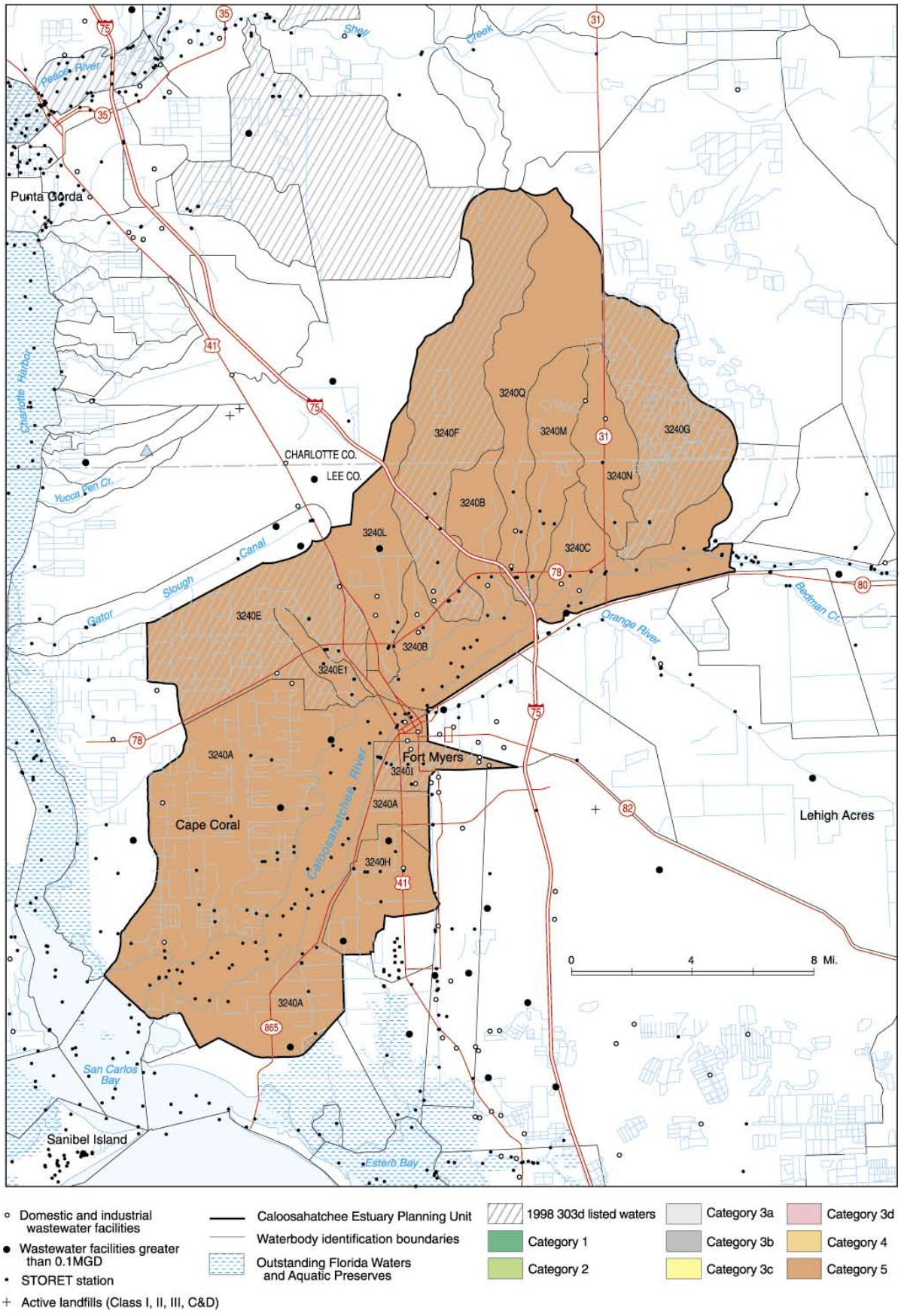


Figure 3.7: Composite Map of the Caloosahatchee Estuary Planning Unit, Including the 1998 303(d) List, Planning List and Verified List Waters, and Potential Pollution Sources

Table 3.9: Integrated Water Quality Assessment Summary for the Caloosahatchee Estuary Planning Unit

					Data Evaluation under the Impaired Surface Waters Rule Criteria[3]			
WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Potentially Impaired (Cat. 3c) for Listed Parameters[4]	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters[5]	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/ 303(d) Integrated Report Assessment Category for WBID[6]
3240A	Tidal Caloosahatchee	Estuary	IIIM	—	—	Fecal Coliforms, Nutrients (Chlorophyll *a*), Copper, DO	Arsenic, Zinc, Lead, pH, Turbidity	5
3240B	Tidal Caloosahatchee	Estuary	IIIM	—	—	Fecal Coliforms, DO, Nutrients (Chlorophyll *a*)	Arsenic, Zinc, Lead, Copper, pH, Turbidity	5
3240C	Tidal Caloosahatchee	Stream	IIIF	—	—	DO, Nutrients (Chlorophyll *a*), Fecal Coliforms	Copper, Arsenic, Zinc, Lead, pH, Turbidity	5
3240E	Yellow Fever Creek	Estuary	IIIM	DO		Fecal Coliforms, DO	Arsenic, Lead, Copper, Nutrients (Chlorophyll *a*), Zinc, pH, Turbidity, Biology	5
3240E1	Hancock Creek	Estuary	IIIM	—	—	Nutrients (Chlorophyll *a*), DO, Fecal Coliforms	Arsenic, Copper, Lead, pH, Turbidity, Zinc	5
3240F	Daughtrey Creek	Stream	IIIF	DO, Nutrients	—	Fecal Coliforms, DO	Biology, Conductance, pH, Turbidity, Nutrients (Chlorophyll *a*), Arsenic, Zinc, Lead, Copper	5
3240G	Trout Creek	Stream	IIIF	BOD, Coliforms, DO	—	Fecal Coliforms, DO, Conductance	Nutrients (Chlorophyll *a*), Biology, BOD 5-Day, Copper, Lead, pH, Turbidity, Arsenic, Zinc	5
3240H	Whisky Creek (Wyoua Creek)	Stream	IIIF	—	—	Fecal Coliforms, DO	Arsenic, Nutrients (Chlorophyll *a*), Copper, Lead, pH, Turbidity, Zinc	5
3240I	Manuel Branch	Estuary	IIIM	Nutrients, DO	Iron, Malathion	Lead, Total Coliforms, Fecal Coliforms, Copper, DO	Zinc, Nutrients (Chlorophyll *a*), pH, Turbidity, Arsenic	5

Table 3.9 (continued)

WBID	Waterbody Segment	Waterbody Type[1]	Class[2]	1998 303(d) List Parameters of Concern	Data Evaluation under the Impaired Surface Waters Rule Criteria[3]: Potentially Impaired (Cat. 3c) for Listed Parameters[4]	Verified Impaired (Cat. 4a, 4b, 4c, or 5) for Listed Parameters[5]	Not Impaired (Cat. 2) for Listed Parameters	EPA's 305(b)/303(d) Integrated Report Assessment Category for WBID[6]
3240L	Gilchrest Drain-Powel	Stream	IIIF	—	—	Fecal Coliforms, Nutrients (Chlorophyll *a*), DO	Conductance, Zinc, Lead, Copper, pH, Turbidity, Arsenic	5
3240M	Stroud Creek	Stream	IIIF	—	—	Fecal Coliforms, Nutrients (Chlorophyll *a*)	Lead, Biology, Conductance, Copper, Arsenic, DO, Zinc, pH, Turbidity	5
3240N	Owl Creek	Stream	IIIF	—	—	Fecal Coliforms, DO	Conductance, pH, Turbidity, Copper, Arsenic, Zinc, Nutrients (Chlorophyll *a*)	5
3240Q	Popash Creek	Stream	IIIF	—	—	Fecal Coliforms, DO, Nutrients (Chlorophyll *a*)	Conductance, Biology, Zinc, Lead, pH, Turbidity, Copper, Arsenic	5

Notes:

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The state's surface water classifications are as follows:
Class II: Shellfish propagation or harvesting
Class III: Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
Class IV: Agricultural water supplies
Class V: Navigation, utility, and industrial use (there are no state waters currently in this class)
[3]The EPA's 305(b)/303(d) Integrated Report categories are as follows:
1—Attains all designated uses;
2—Attains some designated uses;
3a—No data and information are available to determine if any designated use is attained;
3b—Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c—Meets Planning List criteria and is potentially impaired for one or more designated uses;
3d—Meets Verified List criteria and is potentially impaired for one or more designated uses;
4a—Impaired for one or more designated uses and the TMDL is complete;
4b—Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollutant control mechanism provides reasonable assurance that the water will attain standards in the future;
4c—Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5—Water quality standards are not attained and a TMDL is required.
[4]Parameters in **bold** meet the Verified List evaluation criteria, Section 62-303.400, F.A.C.
[5]Parameters in *italics* are in Category 4 (a, b, or c) waters that do not require TMDL development.
[6]The assessment categories listed in this column represent the status of each WBID as a whole, **based on multiple parameters**. The hierarchy for assigning these categories is Category 5, then 4, then 3c, then 2, and then 3b, i.e., each WBID is assigned a category based on the highest category assigned to an individual parameter. For example, if WBID 9999 has total coliforms as Category 5, fecal coliforms as Category 3c, and coliforms-shellfish as Category 2, the single assessment call for the WBID is Category 5.

BOD = Biological oxygen demand
DO = Dissolved oxygen
F = Fresh water
M = Marine

River, Telegraph Swamp, and the Orange River). **Appendix G** provides summary information on Level I land uses in the basin, by planning unit.

Ecological Summary

Although the planning unit is predominately urbanized, the urban category includes undeveloped land in urban areas and inactive subdivisions with street patterns and no structures. About 16 percent of the urban land in the planning unit is actually of the undeveloped type (see the section on **"Residential Development and 'Roads to Nowhere'"** in Chapter 2).

The Caloosahatchee Estuary is occasionally subjected to large, unnatural freshwater releases from Lake Okeechobee through the C-43 Canal (see the section on **"Hydrologic Alterations—'Famine or Feast'"** in Chapter 2). These deluges alter the estuarine salinity gradient and transport significant quantities of sediments and nutrients to the estuary (SFWMD, 2000a). Submerged aquatic vegetation, oyster reef coverage, and bay scallop populations have been drastically harmed by the sudden freshwater infusions (Southwest Florida Regional Planning Council, 1995). The nutrient-enriched deluges, with concomitant low salinity, are also thought to be responsible for the occurrence of fish with lesions (Lollar, 2002; Sosa, 2002) and have been implicated in algal blooms (SFWMD, 2000b), including toxic *cyanobacteria* in estuarine portions of the Caloosahatchee (Barienbrock, 2001).

Fish Consumption Advisories

No freshwater fish consumption advisories for mercury are listed for the planning unit. While no marine fish consumption advisories are specifically listed for the Caloosahatchee Estuary, several advisories are listed for Charlotte Harbor and the Gulf of Mexico **(Table 3.10)**. In light of the proximity of these waterbodies to the Caloosahatchee Estuary, it would be prudent to accept the consumption advisories as valid for the estuarine Caloosahatchee as well.

Table 3.10: Marine Fish Consumption Advisories for Mercury in the Caloosahatchee Region

Fish Species	Waterbody	Advisory
Shark	Charlotte Harbor	Limited Consumption
Crevalle Jack	Charlotte Harbor	Limited Consumption
Spotted Seatrout	Charlotte Harbor	Limited Consumption
Spanish Mackerel	Charlotte Harbor	Limited Consumption
King Mackerel (33"–39")	Gulf of Mexico	Limited Consumption
King Mackerel (>39")	Gulf of Mexico	No Consumption

Source: DEP Web site, 1997.

Water Quality Improvement Plans and Projects

Waters will not be placed on the Verified List if the Department receives reasonable assurance that existing or proposed projects and/or programs are expected to result in the attainment of water quality standards or consistently improve water quality over time. Chapter 4 and **Appendix C** contain additional information on the requirements for reasonable assurance.

For this planning unit, no management plans or projects complying with the Department's guidance for reasonable assurance have been provided for the list of impaired waters.

Chapter 4: The Verified List of Impaired Waters

Public Participation

The Florida Department of Environmental Protection (Department) has worked with a variety of stakeholders and held public meetings on developing and adopting the Verified Lists of impaired waters for the five Group 3 basins across the state. **Table 4.1** lists the statewide schedule for the development and adoption of the Group 3 Verified Lists, including the public meetings. The schedule for the Caloosahatchee Basin is highlighted in boldface type. **Appendix H** contains documentation provided during the public comment period.

Basin-specific draft Verified Lists of waters that met the requirements of the Impaired Surface Waters Rule (IWR) were made available to the public on June 23, 2004. The lists were placed on the Department's Total Maximum Daily Load (TMDL) Program Web site, at http://www.dep.state.fl.us/water/tmdl, and were also sent on request to interested parties by mail or via e-mail.

Citizens were given the opportunity to comment on the draft lists in person and/or in writing. A total of 6 public meetings was held across the state, to encourage public participation on a basin-by-basin basis. The Department also accepted written comments for 45 days beginning June 23, 2004, and ending August 9, 2004.

Following the public meetings for the Group 3 basins, which took place between June 30, 2004, and July 21, 2004, revised draft lists were made available to the public on September 17, 2004. The public had the opportunity to comment on these revised lists either in writing and/or at a final public meeting in Tallahassee. Comments received by October 29, 2004, were considered in preparing the revised draft lists. Comments on any of the lists were accepted and considered throughout the full comment period.

The final basin-specific Verified Lists developed through the public participation process were adopted by Secretarial Order in November 2004, and were submitted to the U.S. Environmental Protection Agency (EPA) in December 2004 as the state's current 303(d) list of impaired waters.

Table 4.1: Schedule for Development and Adoption of the Group 3 Verified Lists

Date	Scheduled Activity
June 23, 2004	**Publication of Draft Verified Lists for the Group 3 Basins and Beginning of Public Comment Period**
June 28, 2004	Public Meeting at Sarasota on the Sarasota Bay–Peace River–Myakka River Basin
June 30, 2004	Public Meeting at Palm Bay on the Upper St. Johns River Basin
July 1, 2004	**Public Meeting at Fort Myers on the Caloosahatchee River Basin**
July 20, 2004	Public Meeting at West Palm Beach on the Lake Worth Lagoon–Palm Beach Coast Basin
July 21, 2004	Public Meeting at Niceville on the Choctawhatchee–St. Andrew Bay Basin
July 21, 2004	Public Meeting at Panama City on the Choctawhatchee–St. Andrew Bay Basin
October 1, 2004	**Public Meeting in Tallahassee on Revised Draft Verified Lists for All Basins, and Public Comments and Input from Prior Public Meetings**
October 29, 2004	**Final Deadline for Receiving Public Comments**
June 17, 2005	**Adoption of Verified List by Secretarial Order**
TBD	**Submittal to EPA as State's 303(d) List of Impaired Waters**

Identification of Impaired Waters

As discussed in Chapter 2, waters on the Verified and Planning Lists must meet specific thresholds and data sufficiency and data quality requirements in the IWR (Rule 62-303, Florida Administrative Code [F.A.C.]). **Appendix A** describes the legislative and regulatory background for the development of the Planning and Verified Lists. **Appendix D** contains a methodology that describes the criteria and thresholds required for both lists under the IWR.

Any waters that do not have sufficient data to be analyzed in accordance with the requirements of the IWR will remain on the 1998 303(d) list of impaired waters maintained by the EPA. These waters are not delisted, and they will be sampled during the next phases of the watershed management cycle so that their impairment status can be verified.

The Verified List of Impaired Waters

Table 4.2 contains the Verified List of impaired waters for the Caloosahatchee Basin, based on the water quality assessment performed using IWR Run 17.0, as of June 30, 2004. **Figure 4.1** shows waters on the Verified List for the entire basin and the projected year for TMDL development. For presentation purposes, the entire watershed for the listed water is highlighted. However, only the main waterbody in the assessment unit has been assessed, and other waters in the watershed may not be impaired.

Table E.1 in Appendix E contains the master list of all assessed waters in the basin as of June 30, 2004. An order containing the Verified List of Impaired Group 3 Waters was signed by the Department's Secretary on June 17, 2005. The order was officially noticed in the June 24, 2005, edition of the *Florida Administrative Weekly*, which started a 21-day period to file a petition challenging the order and a 30-day period to appeal the order.

Table 4.2: The Verified List of Impaired Waters

WBID	Waterbody Segment Name	Waterbody Type	Waterbody Class[1]	1998 303(d) Parameters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Priority for TMDL Development[2]	Projected Year for TMDL Development[2]	Comments[3]
East Caloosahatchee Planning Unit								
3237A	East Caloosahatchee	Stream	IIIF	—	Iron	Medium	2009	Planning period: 69/106; verified period: 23/60.
3237B	Long Hammock Creek	Stream	IIIF	—	DO	Medium	2009	Planning period: 4/17; verified period: 6/24. Impaired based on IWR thresholds. Nutrients were identified as a causative pollutant based on chlorophyll data/nutrient impairment verification.
3237B	Long Hammock Creek	Stream	IIIF	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 20 µg/L in 2000 (38.68 µg/L) and 2002 (40.08 µg/L). No TP data in the verified period. TP median represents the planning period. Limiting nutrient has not been identified, and the water is assumed to be co-limited.
3237C	Lake Hicpochee	Lake	IIIF	—	Lead	Medium	2009	Planning period: 20/24; verified period: 40/56.
3237C	Lake Hicpochee	Lake	IIIF	—	Total Coliforms	Medium	2009	Planning period: 9/28; verified period: 12/51.
3237D	Ninemile Canal	Stream	IIIF	Coliforms	Fecal Coliforms	High	2004	Planning period: 4/3; verified period: 9/49.
3237D	Ninemile Canal	Stream	IIIF	—	Lead	Medium	2009	Planning period: 6/12; verified period: 14/28.
3246	C-21	Stream	IIIF	—	Iron	Medium	2009	Planning period: 83/107; verified period: 21/51.
West Caloosahatchee Planning Unit								
3235A	West Caloosahatchee	Stream	I	—	Iron	Medium	2009	Planning period: 49/76; verified period: 25/50.
3235A	West Caloosahatchee	Stream	I	—	Lead	Medium	2009	Planning period: 1/29; verified period: 11/45.

Table 4.2 (continued)

WBID	Waterbody Segment Name	Waterbody Type	Waterbody Class[1]	1998 303(d) Parameters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Priority for TMDL Development[2]	Projected Year for TMDL Development[2]	Comments[3]
West Caloosahatchee Planning Unit, continued								
3235D	Jacks Branch	Stream	IIIF	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 20 µg/L in 1999 (28.63 µg/L) and 2000 (29.87 µg/L). Limited TP data in the verified period (1 observation). Limiting nutrient has not been identified, and the water is assumed to be co-limited.
3235K	Townsend Canal	Stream	IIIF	—	Copper	Medium	2009	Planning period: 0/6; verified period: 6/27.
3235K	Townsend Canal	Stream	IIIF	—	Lead	Medium	2009	Planning period: 4/6; verified period: 13/28.
Orange River Planning Unit								
3240J	Billy Creek	Estuary	IIIM	—	Fecal Coliforms	Medium	2009	Planning period: 49/149; verified period: 46/145.
Caloosahatchee Estuary Planning Unit								
3240A	Tidal Caloosahatchee	Estuary	IIIM	—	Copper	Medium	2009	Planning period: 66/317; verified period: 34/228.
3240A	Tidal Caloosahatchee	Estuary	IIIM	—	DO	Medium	2009	Planning period: 282/851; verified period: 203/583. Verified Impaired. BOD (median of 2.4 mg/L) and nutrients (based on chlorophyll data) were identified as the possible causative pollutants.
3240A	Tidal Caloosahatchee	Estuary	IIIM	—	Fecal Coliforms	Medium	2009	Planning period: 147/516; verified period: 134/521.

Table 4.2 (continued)

WBID	Waterbody Segment Name	Waterbody Type	Waterbody Class[1]	1998 303(d) Parameters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Priority for TMDL Development[2]	Projected Year for TMDL Development[2]	Comments[3]
Caloosahatchee Estuary Planning Unit, continued								
3240A	Tidal Caloosahatchee	Estuary	IIIM	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 11 µg/L in 1999 (12.21 µg/L), 2000 (17.21 µg/L), 2001 (17.51 µg/L) , and 2002 (19.22 µg/L) in 2002. Data indicate that the WBID is nitrogen limited (TN/TP ratio median = 7.75 with a standard deviation of 12.81, range 0.09–150, 469 observations).
3240B	Tidal Caloosahatchee	Estuary	IIIM	—	DO	Medium	2009	Planning period: 82/300; verified period: 57/150. Verified impaired. Nutrients (based on chlorophyll data) were identified as the possible causative pollutant.
3240B	Tidal Caloosahatchee	Estuary	IIIM	—	Fecal Coliforms	Medium	2009	Planning period: 36/115; verified period: 32/111.
3240B	Tidal Caloosahatchee	Estuary	IIIM	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 11 µg/L in 2000 (21.42 µg/L). Data indicate that the WBID is nitrogen limited (TN/TP ratio median = 7.5 with a standard deviation of 13.27, range 0.67–41, 191 observations).
3240C	Tidal Caloosahatchee	Stream	IIIF	—	DO	Medium	2009	Planning period: 259/331; verified period: 216/282. Verifed impaired. Nutrients (based on chlorophyll data) were identified as the possible causative pollutant.
3240C	Tidal Caloosahatchee	Stream	IIIF	—	Fecal Coliforms	Medium	2009	Planning period: 83/198; verified period: 84/194.

Table 4.2 (continued)

WBID	Waterbody Segment Name	Waterbody Type	Waterbody Class[1]	1998 303(d) Parameters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Priority for TMDL Development[2]	Projected Year for TMDL Development[2]	Comments[3]
Caloosahatchee Estuary Planning Unit, continued								
3240C	Tidal Caloosahatchee	Stream	IIIF	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 20 µg/L in 2000 (24.77 µg/L). Data indicate that the WBID is nitrogen limited (TN/TP ratio median = 8.77 with a standard deviation of 14.485, range 0.182–119, 359 observations).
3240E	Yellow Fever Creek	Estuary	IIIM	—	Fecal Coliforms	Medium	2009	Planning period: 13/56; verified period: 20/66.
3240E1	Hancock Creek	Estuary	IIIM	—	DO	Medium	2009	Planning period: 111/225; verified period: 64/119. Verifed impaired. BOD (median value of 2.5 mg/L), and nutrients (based on chlorophyll data) were identified as the possible causative pollutants.
3240E1	Hancock Creek	Estuary	IIIM	—	Fecal Coliforms	Medium	2009	Planning period: 30/130; verified period: 27/130.
3240E1	Hancock Creek	Estuary	IIIM	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 11 µg/L in 2000 (11.73 µg/L). Data indicate that the WBID is nitrogen limited (TN/TP ratio median = 5.34 with a standard deviation of 11.27, range 0.13–95, 144 observations).
3240F	Daughtrey Creek	Stream	IIIF	—	Fecal Coliforms	Medium	2009	Planning period: 41/275; verified period: 43/274.
3240G	Trout Creek	Stream	IIIF	—	Conductance	Medium	2009	Planning period: 16/124; verified period: 14/72. Conductance is believed to be impaired due to agricultural land use.

Table 4.2 (continued)

WBID	Waterbody Segment Name	Waterbody Type	Waterbody Class[1]	1998 303(d) Parameters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Priority for TMDL Development[2]	Projected Year for TMDL Development[2]	Comments[3]
Caloosahatchee Estuary Planning Unit, continued								
3240G	Trout Creek	Stream	IIIF	Coliforms	Fecal Coliforms	Medium	2009	Planning period: 20/70; verified period: 22/70.
3240H	Whisky Creek (Wyoua Creek)	Stream	IIIF	—	Fecal Coliforms	Medium	2009	Planning period: 25/142; verified period: 28/148.
3240I	Manuel Branch	Estuary	IIIM	—	Copper	Medium	2009	Planning period: 8/102; verified period: 6/23. Verified period data based on IWR Run 20.
3240I	Manuel Branch	Estuary	IIIM	—	Fecal Coliforms	Medium	2009	Planning period: 28/91; verified period: 8/47. VP data based on IWR Run 20.
3240I	Manuel Branch	Estuary	IIIM	—	Lead	Medium	2009	Planning period: 9/127; verified period: 6/25. Verified period data based on IWR Run 20.
3240I	Manuel Branch	Estuary	IIIM	—	Total Coliforms	Medium	2009	Planning period: 10/16; verified period: 13/22. Verified period data based on IWR Run 20.
3240L	Gilchrest Drain-Powel	Stream	IIIF	—	DO	Medium	2009	Planning period: 172/232; verified period: 147/204. Verified period data based on IWR Run 20. Verifed impaired. Nutrients (based on chlorophyll data) were identified as the possible causative pollutant.
3240L	Gilchrest Drain-Powel	Stream	IIIF	—	Fecal Coliforms	Medium	2009	Planning period: 31/136; verified period: 40/206. Verified period data based on IWR Run 20.

Table 4.2 (continued)

WBID	Waterbody Segment Name	Waterbody Type	Waterbody Class[1]	1998 303(d) Parameters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Priority for TMDL Development[2]	Projected Year for TMDL Development[2]	Comments[3]
Caloosahatchee Estuary Planning Unit, continued								
3240L	Gilchrest Drain-Powel	Stream	IIIF	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 20 µg/L in 2002 (20.02 µg/L). Data indicate that the WBID is nitrogen limited (TN/TP ratio median = 5.15 with a standard deviation of 15.41, range 0.14–23, 143 observations).
3240M	Stroud Creek	Stream	IIIF	—	Fecal Coliforms	Medium	2009	Planning period: 23/13; verified period: 25/135.
3240M	Stroud Creek	Stream	IIIF	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 20 µg/L in 2000 (33.64 µg/L). Data indicate that the WBID is co-limited for nitrogen and phosphorus (TN/TP ratio median = 14.6 with a standard deviation of 30.87, range 0.29–219, 139 observations).
3240N	Owl Creek	Stream	IIIF	—	Fecal Coliforms	Medium	2009	Planning period: 25/68; verified period: 29/70.
3240Q	Popash Creek	Stream	IIIF	—	DO	Medium	2009	Planning period: 246/312; verified period: 130/163. Impaired by the IWR threshold. Nutrient impairment is identified as the causative pollutant based on chlorophyll data/nutrient impairment verification.
3240Q	Popash Creek	Stream	IIIF	—	Fecal Coliforms	Medium	2009	Planning period: 29/175; verified period: 38/174.

Table 4.2 (continued)

WBID	Waterbody Segment Name	Waterbody Type	Waterbody Class[1]	1998 303(d) Parameters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Priority for TMDL Development[2]	Projected Year for TMDL Development[2]	Comments[3]
Caloosahatchee Estuary Planning Unit, continued								
3240Q	Popash Creek	Stream	IIIF	—	Nutrients (Chlorophyll *a*)	Medium	2009	Annual average Chlorophyll *a* values exceeded IWR threshold of 20 µg/L in 2000 (88.13 µg/L), 2002 (32.90 µg/L). Data indicate that the WBID is co-limited for nitrogen and phosphorus (TN/TP ratio median = 14.2 with a standard deviation of 23.78, range 0.17–263, 181 observations).

Notes:

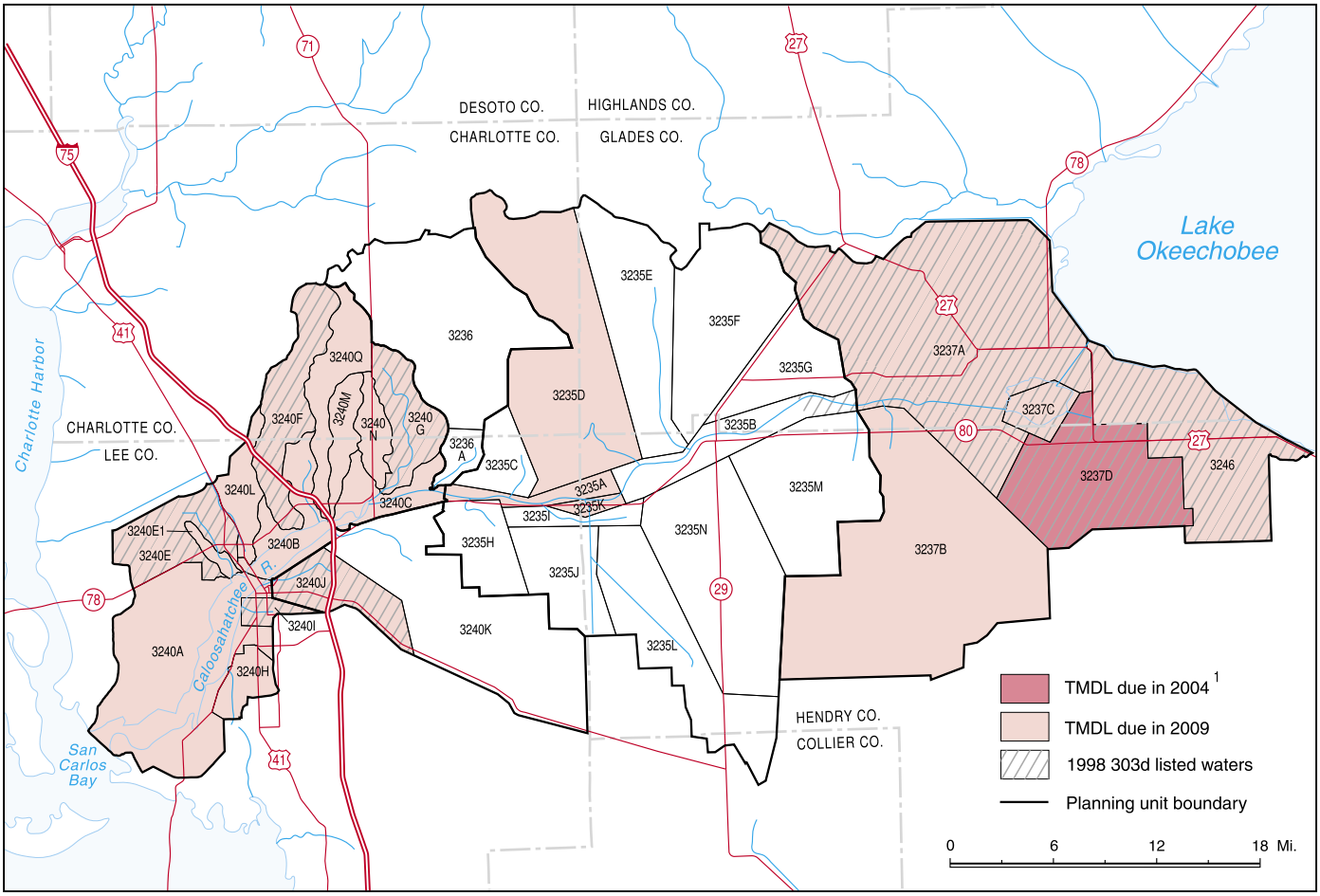
[1]Florida's waterbody classifications are defined as follows:
1—Potable water supplies,
2—Shellfish propagation or harvesting,
3—Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife
4—Agricultural water supplies,
5—Navigation, utility, and industrial use.
[2]Priority and schedule reflect the priority established for the WBID in the 1998 303(d) list. Where a parameter was 1998 303(d) listed, the priority shown in the 1998 303(d) list was retained if it was originally high, or changed to medium if it was originally low. In the case of mercury, the priority remains low. Where a parameter was only identified as impaired under the IWR, priorities of high, medium, or low were used.
[3]Planning period = January 1, 1992, through December 31, 2001; Verified period = January 1, 1997, through June 30, 2004.

F = Fresh water
M = Marine
BOD = Biological oxygen demand
DO = Dissolved oxygen
TN = Total nitrogen
TP = Total phosphorus

Pollutants Causing Impairments

Of the 36 waterbody segments in the Caloosahatchee Basin, 22 waters are impaired for at least 1 parameter, and a TMDL is required for these waters. There are a total of 46 parameter listings for impairment following the methodology in **Appendix D**. The Caloosahatchee Estuary Planning Unit has the largest number of impaired parameter listings with 31, followed by the East and West Caloosahatchee Planning Units, each with 7 listings. The most common parameter exhibiting impairment throughout the Caloosahatchee Basin is fecal coliforms, with 15 listings, followed by nutrients (chlorophyll *a*) with 9 listings, and DO with 7 listings.

As required by the IWR, the Department must identify the pollutants causing or contributing to DO exceedances in order to place DO on the Verified List. If a waterbody segment is on the Verified List for both DO and nutrients, nutrients are identified as a pollutant contributing to



[1] Note: WBID 3237D has a high priority TMDL due in 2004, and a medium priority TMDL due in 2009.

Figure 4.1: Waters on the Verified List, with Projected Year for TMDL Development

DO exceedances. The Department also applies the following analysis to identify the pollutant(s) contributing to DO exceedances:

1. The waterbody segment median values for biological oxygen demand (BOD), total nitrogen (TN), and total phosphorus (TP) are determined for the verified period (i.e., January 1, 1997, to June 30, 2004).
2. The median values are then compared with the screening levels for the appropriate waterbody type. The screening levels represent the 70th percentile value of data collected from streams, lakes, or estuaries **(Table 4.3)**.
3. If a waterbody segment's median value exceeds the screening level, the parameter is identified as a pollutant contributing to the exceedances.

Table 4.4 provides the median values for waterbody segments where there is a sufficient number of DO exceedances to place the water on the Verified List. If a waterbody segment has a sufficient number of

Table 4.3: Screening Level Values (70th Percentile) Based on STORET Data from 1970 to 1987

	BOD (mg/L)	TN (mg/L)	TP (mg/L)
Streams	2.0	1.6	0.22
Lakes	2.9	1.7	0.11
Estuaries	2.1	1.0	0.19

Source: Friedemann and Hand, 1989.

Table 4.4: Caloosahatchee Basin Median Values for the Verified Period

WBID	Waterbody Segment	Waterbody Type	BOD 5 Day (mg/L)	Total Nitrogen (mg/L)	Total Phosphorus (mg/L)
3240C	Tidal Caloosahatchee	Stream	2	1.105	0.12
3240G	Trout Creek	Stream	1.5	0.84	0.05
3240J	Billy Creek	Estuary	1.8	0.1915	0.15
3235G	Cypress Branch	Stream	1	1.654	0.098
3246	C-21	Stream	ND	1.953	0.098
3240A	Tidal Caloosahatchee	Estuary	2.4	0.83	0.09
3240B	Tidal Caloosahatchee	Estuary	1.5	0.85	0.11
3240E	Yellow Fever Creek	Estuary	1.5	0.745	0.2
3240E1	Hancock Creek	Estuary	2.5	0.825	0.145
3240F	Daughtrey Creek	Stream	1.7	0.77	0.06
3240H	Whisky Creek (Wyoua Creek)	Stream	1.5	0.51	0.05
3240I	Manuel Branch	Estuary	2	0.8145	0.05
3240L	Gilchrest Drain-Powel	Stream	1.6	0.65	0.12
3240N	Owl Creek	Stream	1.5	0.52	0.05
3240Q	Popash Creek	Stream	1.9	0.75	0.05
3237A	East Caloosahatchee	Stream	1.4	1.6765	0.075
3237B	Long Hammock Creek	Stream	2	1.482	ND
3237C	Lake Hicpochee	Lake	4.15	1.859	ND
3237D	Ninemile Canal	Stream	2	2.11	ND
3235A	West Caloosahatchee	Stream	1.6	1.382	0.103
3235B	West Caloosahatchee	Stream	2.4	1.545	ND
3235C	Cypress Creek	Stream	1.2	1.07	0.053
3235D	Jacks Branch	Stream	3.25	1.32	0.051
3235E	Bee Branch	Stream	2.3	1.305	ND
3235F	Pollywog Creek	Stream	1	0.53	ND
3235H	Hickey Creek	Stream	1.5	0.42	0.05
3235J	Dog Canal	Stream	2	0.411	ND
3235K	Townsend Canal	Stream	2	1.48	ND
3235L	Townsend Canal	Stream	4.5	2.112	ND
3235M	Goodno Canal	Stream	1	1.105	ND

ND = No data

exceedances for placement on the Verified List but the median values are less than the screening levels, the DO for that segment is included on the Planning List.

Additionally, to place a water segment on the Verified List for nutrients, the Department must identify the limiting nutrient or nutrients on the Verified List, as required by the IWR. The following method is used to identify the limiting nutrient(s) in streams and lakes:

4. The ratios of TN to TP are calculated for each paired value of TN and TP (per sampling event) collected during the verified period.
5. The individual ratios over the entire verified period are evaluated to determine the limiting nutrient(s). If all the sampling event ratios are less than 10, nitrogen is identified as the limiting nutrient, and if all the ratios are greater than 30, phosphorus is identified as the limiting nutrient. Both nitrogen and phosphorus are identified as limiting nutrients if the ratios are between 10 and 30.

Table 4.5 displays the nitrogen and phosphorus ratios for stream and lake segments potentially impaired by nutrients.

Adoption Process for the Verified List of Impaired Waters

The Verified List must be submitted in a specific format (Section 62-303.710, F.A.C.) before being approved by order of the Department's Secretary. The list must specify the pollutant and concentration causing the impairment. If a waterbody segment is listed based on water quality criteria exceedances, then the list must provide the applicable criteria. However, if the listing is based on narrative or biological criteria, or impairment of other designated uses, and the water quality criteria are met, the Verified

Table 4.5: Caloosahatchee Basin Nitrogen-to-Phosphorus Ratios for the Verified Period

WBID	Waterbody Segment	Waterbody Type	Total Nitrogen Median (mg/L)	Total Phosphorus Median (mg/L)	Nitrogen-to-Phosphorus Ratio Median	Nitrogen-to-Phosphorus Ratio Minimum	Nitrogen-to-Phosphorus Ratio Maximum
3246	C-21	Stream	1.953	0.098	19.484	5.591	98.9
3240A	Tidal Caloosahatchee	Estuary	0.83	0.09	7.75	0.094	150
3240B	Tidal Caloosahatchee	Estuary	0.85	0.11	7.5	0.667	141
3240C	Tidal Caloosahatchee	Stream	1.105	0.12	8.7692	0.182	119
3240E1	Hancock Creek	Estuary	0.825	0.145	5.3375	0.133	95
3240L	Gilchrest Drain-Powel	Stream	0.65	0.12	5.1538	0.143	123
3240M	Stroud Creek	Stream	0.8	0.05	14.6	0.286	219
3240Q	Popash Creek	Stream	ND	ND	ND	ND	ND
3237A	East Caloosahatchee	Stream	1.6765	0.075	23.414	7.245	73.44
3237B	Long Hammock Creek	Stream	1.482	ND	ND	ND	ND
3237C	Lake Hicpochee	Lake	1.859	ND	ND	ND	ND
3235D	Jacks Branch	Stream	1.32	0.051	ND	ND	ND

ND = No data

List is required to specify the concentration of the pollutant relative to the water quality criteria and explain why the numeric criterion is not adequate.

For waters with exceedances of the DO criteria, the Department must identify the pollutants causing or contributing to the exceedances and list both the pollutant and DO in the Verified List.

For waters impaired by nutrients, the Department is required to identify whether nitrogen or phosphorus, or both, are the limiting nutrients, and specify the limiting nutrient(s) in the Verified List.

The Verified List must also include the priority and schedule for TMDL development established for a waterbody segment and note any waters that are being removed from the current Planning List. In future watershed management cycles, the list must also note waters that are being removed from any previous Verified List for the basin.

Chapter 5: TMDL Development, Allocation, and Implementation

Prioritization of Listed Waters

Following the identification of impaired waters on the 303(d) list, the Florida Department of Environmental Protection (Department) determines priorities for developing total maximum daily loads (TMDLs) in Phase 3 of the watershed management cycle. When TMDLs are established, general allocations of pollutant load reductions are identified, at least to the level of point and nonpoint source categories.

Because TMDLs cannot be developed for all listed waters during a single watershed management cycle, waterbodies will be prioritized using the criteria in the Impaired Surface Waters Rule (IWR) (Section 62-303.500, Florida Administrative Code). The rule states that when establishing the TMDL development schedule for waters on the Verified List, the Department will prioritize impaired waterbody segments according to the severity of the impairment and each waterbody's designated uses, taking into account the most serious water quality problems, the most valuable and threatened resources, and the risk to human health and aquatic life.

Under the IWR, the determination of high-, low-, and medium-priority waters is based on the following criteria.

High-priority waters:

- Waterbody segments where the impairment poses a threat to potable water supplies or human health;
- Waterbody segments where the impairment is due to a pollutant regulated by the Clean Water Act and the pollutant has contributed to the decline or extirpation of a federally listed threatened or endangered species, as indicated in the Federal Register listing the species; or
- Waterbody segments verified as impaired that are included on the U.S. Environmental Protection Agency's (EPA's) 1998 303(d) list as high priority.

Low-priority waters:

- Waterbody segments that are listed before 2010 because of fish consumption advisories for mercury (due to the current insufficient understanding of how mercury cycles in the environment);

- Canals, urban drainage ditches, and other artificial waterbody segments that are listed only due to exceedances of dissolved oxygen criteria; or
- Waterbody segments that were not on the Planning List but were identified as impaired during Phase 2 of the watershed management cycle and were included on the Verified List, unless the segment meets the second high-priority criterion.
- The EPA has also proposed assigning to this category the list of additional waterbody segments that the agency developed using its own evaluation methodology, until the Department has had the opportunity to investigate these waterbodies further.

All segments not designated high or low priority are medium priority, and are prioritized based on the following factors:

- The presence of Outstanding Florida Waters;
- The presence of waterbody segments that fail to meet more than one designated use, i.e., aquatic life, primary contact and recreation, fish and shellfish consumption, drinking water, and the protection of human health;
- The presence of waterbody segments that exceed an applicable water quality criterion or alternative threshold with a frequency of greater than 25 percent at a minimum confidence level of 90 percent;
- The presence of waterbody segments that exceed more than one applicable water quality criterion; or
- Administrative needs of the TMDL program, including meeting a TMDL development schedule agreed to with the EPA, basin priorities related to the Department's watershed management approach, and the number of administratively continued permits in the basin.

The Department is adhering to the TMDL schedule established in the Consent Decree between the EPA and Earthjustice for waters on the 1998 303(d) list that are also identified as impaired under the IWR.

Table 5.1 lists the high-priority waters for TMDL development in the Caloosahatchee Basin. **Figure 5.1** shows the locations of these waters and their watersheds. The two waterbody segments listed in the table were also high priorities on the 1998 303(d) list. Of these, only one segment had sufficient water quality information to verify a parameter as the cause of impairment (fecal coliforms in Ninemile Canal). The remaining impairments could not be verified by the Department, and the establishment of those TMDLs will be the responsibility of the EPA.

Table 5.1: Priorities for TMDL Development in the Caloosahatchee Basin

Planning Unit	WBID	Waterbody Segment	Water-body Type	Water-body Class	1998 303(d) Param-eters of Concern	Parameters Identified Under the Impaired Surface Waters Rule	Assess-ment Status	Priority Year for TMDL Develop-ment	Comments (# Exceedances/ # Samples)
East Caloosahatchee	3237C	Lake Hicpochee	Lake	IIIF	Nutrients	—	Planning List*	2004	Planning period: No Data; verified period: No Data. Placed on Planning List pursu-ant to Subsection 62.303.300(2), F.A.C.
East Caloosahatchee	3237D	Ninemile Canal	Stream	IIIF	BOD	—	Planning List*	2004	No data available for the verified period.
East Caloosahatchee	3237D	Ninemile Canal	Stream	IIIF	Coliforms	Fecal Coliforms	Impaired	2004	Planning period: 4/34; verified period: 9/49.
East Caloosahatchee	3237D	Ninemile Canal	Stream	IIIF	DO	DO	Planning List*	2004	A causative pollut-ant has not been identified. Placed on Planning List pursu-ant to Subsection 62.303.300(2), F.A.C.

*Note: Those parameters that could not be verified impaired will have TMDLs established for them by the EPA.

BOD = Biological oxygen demand
DO = Dissolved oxygen

Total Maximum Daily Load Development

During Phase 3 of the watershed management cycle, TMDLs will be developed for both point and nonpoint sources of pollutants in impaired waterbodies and will be adopted by rule at the end of this phase.

TMDL development involves determining the maximum amount of a given pollutant that a waterbody can assimilate and still meet the applicable numeric or narrative water quality criterion for the pollutant. In most cases, this "assimilative" capacity will be determined using computer modeling (both hydrodynamic and water quality models) that predicts the fate and transport of pollutants in the receiving waters. Modeling for the typical TMDL will include model setup, calibration, and verification, followed by a variety of model runs that determine the assimilative capacity of the water under worst-case conditions.

State law and federal regulations require that TMDLs include a margin of safety (MOS) that takes into account "any lack of knowledge concerning the relationship between effluent limitations and water quality." The EPA has allowed states to establish either a specific MOS (typically some percentage of the assimilative capacity) or an implicit MOS based on conservative assumptions in the modeling. To date, the Department has elected to

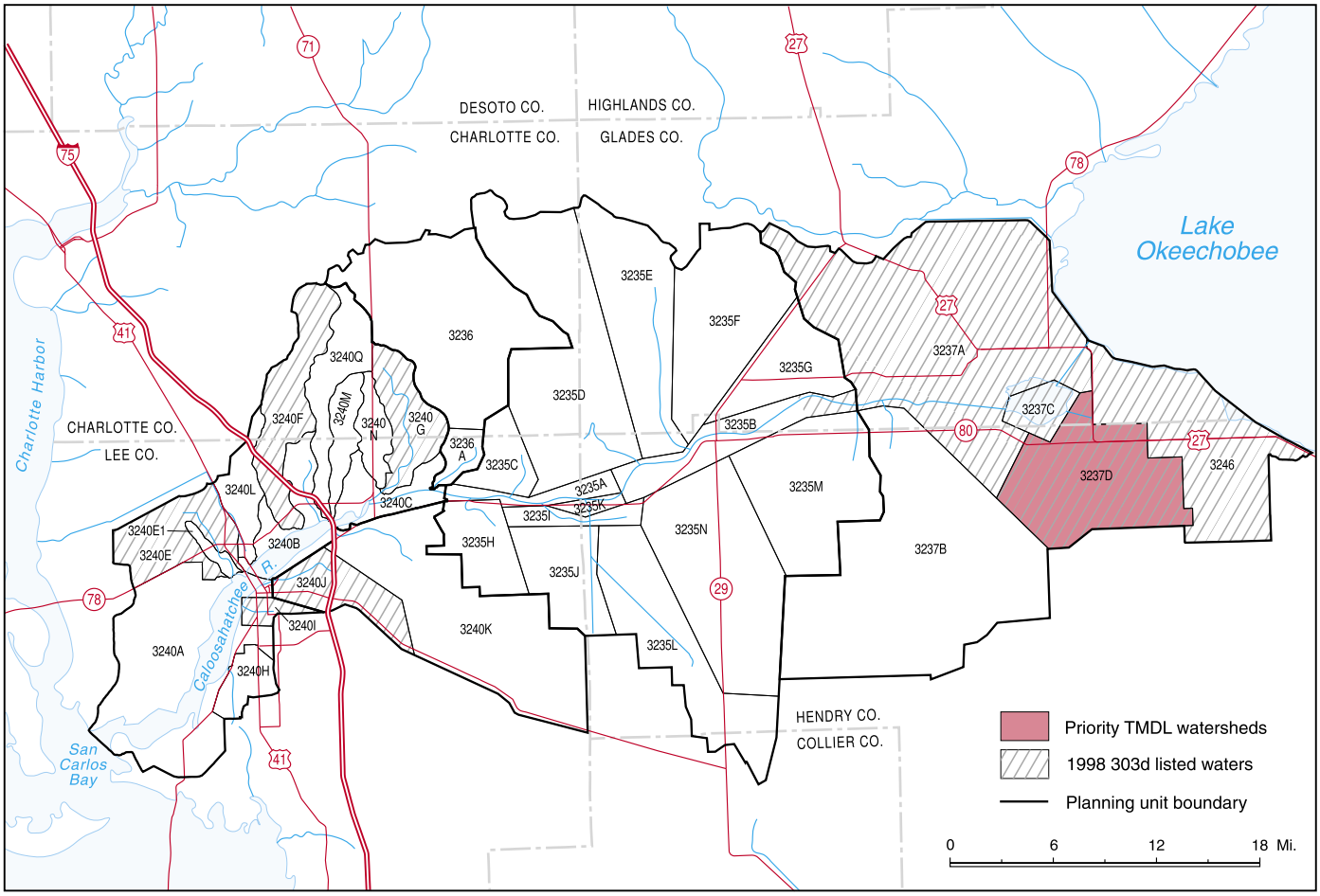


Figure 5.1: Caloosahatchee Basin Priority TMDL Watersheds for 2004

establish an implicit MOS based on predictive model runs that incorporate a variety of conservative assumptions (they examine worst-case ambient flow conditions and worst-case temperature, and assume that all permitted point sources discharge at their maximum permitted amount).

It is important to note that TMDLs will be developed only for the actual pollutants causing the impairment in the listed waterbody. These are called the "pollutants of concern." In Florida, the most commonly listed pollutants of concern are nutrients, sediments, and coliforms. TMDLs will not be developed for impairments not due to pollutant discharges—for example, natural conditions, physical alterations such as dams and channelization, or changes in the flow of the water. In other cases, a waterbody may be deemed potentially impaired based on bioassessment data or toxicity data. In these cases, the Department must determine the actual pollutant causing the impairment before a TMDL can be developed.

Total Maximum Daily Load Allocation and Implementation

Initial Allocation of Pollutant Loadings

The Florida Watershed Restoration Act (FWRA) requires that a TMDL include the "establishment of reasonable and equitable allocations . . . among point and nonpoint sources . . . ." The Department refers to this as the "initial allocation," which is adopted by rule. For the purposes of allocating the required pollutant loadings, the term "point sources" primarily includes traditional sources such as domestic and industrial wastewater discharges.

Recent EPA guidance requires states to include as point sources those stormwater systems that are covered by a National Pollutant Discharge Elimination System (NPDES) stormwater permit. However, NPDES-permitted stormwater discharges are not subject to the same types of effluent limitations, cannot be centrally collected and treated, and typically have not invested in treatment controls to the same degree as traditional point sources. Nonpoint sources include intermittent, rainfall-driven, diffuse sources of pollutants associated with everyday human activities, including runoff from urban land uses, agriculture, silviculture, and mining; discharges from failing septic systems; and atmospheric deposition.

These point and nonpoint definitions do not directly relate to whether a source is regulated. Some nonpoint sources such as stormwater systems are permitted under the regulatory programs of the Department or water management districts, while others, such as agricultural stormwater discharges, are not. This distinction is important because the implementation of the allocations to nonpoint sources outside the authority of regulatory programs will require cooperation from dischargers to implement best management practices (BMPs) voluntarily.

While a "detailed allocation" will ultimately be necessary to implement a TMDL fully, a key goal of the initial allocation is to assign responsibility for pollutant load reductions between point and nonpoint sources. For point sources, allocations will be implemented through the Department's NPDES wastewater and stormwater permitting programs. The implementation of nonpoint source load reductions will be done through a combination of regulatory and nonregulatory processes.

Initial allocations of pollutant loadings will also be made to historical sources (e.g., the phosphorus-laden sediments at the bottom of a lake) and upstream sources (those entering an impaired waterbody). Upstream sources include sources outside Florida, and these sources will receive reduced allocations similar to in-state sources.

The FWRA provided direction for the allocation of TMDLs and directed the Department to provide guidance on the allocation process by establishing an Allocation Technical Advisory Committee (ATAC), consisting of representatives of key stakeholder groups. The committee's report recommended a three-step process for developing initial allocations and addressed detailed allocations for nonpoint sources, stakeholder involvement, the use of BMPs, and other TMDL implementation issues (Department, 2001). A copy of the ATAC report is available at http://www.dep.state.fl.us/water/tmdl/docs/Allocation.pdf.

Implementation Programs and Approaches

The FWRA designates the Department as the lead agency in coordinating the implementation of TMDLs. Existing programs and approaches through which TMDLs may be carried out include the following:

- Permitting and other existing regulatory programs, such as NPDES permits, domestic and industrial wastewater permits, and stormwater/Environmental Resource Permits—**Table 5.2** lists the municipal NPDES stormwater permittees in the Caloosahatchee Basin;
- Local land development codes;
- Nonregulatory and incentive-based programs, including BMPs, cost sharing, waste minimization, pollution prevention, new approaches to land use design and development, and public education;
- Basin Management Action Plans (B-MAPs) developed under the FWRA;
- Other water quality management and restoration activities, for example, Surface Water Improvement and Management plans approved under Section 373.456, Florida Statutes;

Table 5.2: Municipal NPDES Stormwater Permittees in the Caloosahatchee Basin

WBID	Facility ID #	NPDES ID#	Facility
3246	14284	FL0040665	City of Clewiston WWT
3237A	14270	FL0037541	E.R. Jahna Ind. Ortona Mine
3235N	17757	FLG110065	Krehling Plant 9 LaBelle
3240K	14585	FL0001490	FPL Fort Myers Plant
3205K	32724	FLRNEE232	ABF Freight Systems Inc.
3205K	30135	FLRNEE110	Averitt Express Inc.
3205K	33811	FLRNEE237	Averett Express Fort Myers Service Center
3295K	31985	FLRNEE211	The News-Press
3205K	29852	FLRNEE097	Mariner Products Inc.
3205K	14433	FL0021261	Fort Myers Central AWWTF
3240I	33731	FLRNEE270	Supter Transport Inc.
3240I	30033	FLRNEE105	Tellow Transport
3240I	30821	FLRNEE141	Tri Circle Partners Inc.
3240I	29645	FLRNEE076	Purrseaverance M/V
3240I	33076	FLRNEE251	Ace Press Inc.
3240A	29913	FLRNEE101	J.C. Cruises Inc.
3240A	14606	FL0030325	Waterway Estates Advanced WWTP
3240A	17673	FLG110028	Schwab Ready Mix Inc.
3240A	14429	FL0030007	City of Cape Coral
3240A	33475	FLRNEE265	Printers Ink International
3240E	17636	FLG110021	Old Castle Precast Inc.

- Pollutant trading or other equitable economically based agreements;
- Public works, including capital facilities; or
- Land acquisition.

These programs and approaches will be carried out at local, regional, state, and possibly federal levels. TMDL implementation will require extensive stakeholder involvement throughout the state and, in some cases, between Florida and other states. **Appendix A** provides additional details on the implementation programs and approaches listed here.

Development of Basin Management Action Plans

The FWRA authorizes the Department to develop B-MAPs for implementing TMDLs. These plans will be developed with extensive stakeholder input to build consensus on detailed allocations based on the initial general allocations to categories of discharges.

The B-MAPs would contain final allocations, strategies for meeting the allocations, schedules for implementation, funding mechanisms, applicable local ordinances, and other elements. In cases where stakeholder consensus could not be reached on detailed allocations and/or a B-MAP within a reasonable time, the Department would develop the allocations.

Once a B-MAP is developed, the Department will make it available for public review and comment. Guidance for the content and format of the B-MAPs is being developed; the plans are likely to include a description of both regulatory and nonregulatory approaches to meeting specific TMDLs.

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Appendix A: Legislative and Regulatory Background on the Watershed Management Approach and the Implementation of Total Maximum Daily Loads

Federal and State Legislation on Surface Water Quality and Total Maximum Daily Loads

Clean Water Act

Congress enacted the Clean Water Act in 1972 with the goal of restoring and maintaining the "chemical, physical, and biological integrity of the nation's waters" (33 U.S.C. § 1251[a]). The ultimate goal of the act is to eliminate the "discharge of [all] pollutants into navigable waters" (33 U.S.C. § 1251[a][1]).

Section 305(b) of the Clean Water Act requires states to report biennially to the U.S. Environmental Protection Agency (EPA) on their water quality. The 305(b) assessment report provides information on the physical, chemical, biological, and cultural features of each river basin in Florida. This initial assessment provides a common factual basis for identifying information sources and major issues, and for determining the future changes, strategies, and actions needed to preserve, protect, and/or restore water quality. Understanding the physical framework of each basin allows the development of a science-based methodology for assessing water quality and an accurate picture of the waters that are most impaired or vulnerable to contamination.

Section 303(d) of the Clean Water Act requires states to submit to the EPA lists of surface waters that do not meet applicable water quality standards and establish total maximum daily loads (TMDLs) for each of these waters on a schedule. A pollution limit is then allocated to each pollutant source in an individual river basin.

A TMDL represents the maximum amount of a given pollutant that a waterbody can assimilate and meet all of its designated uses (see **Noteworthy** on Florida's surface water quality classifications for a listing of these classifications). A waterbody that does not meet its designated use is defined as *impaired*.

NOTEWORTHY: FLORIDA'S SURFACE WATER QUALITY CLASSIFICATIONS

Florida's water quality standards program, the foundation of the state's program of water quality management, designates the "present and future most beneficial uses" of the waters of the state (Subsection 403.061[10], F.S.). Water quality criteria, expressed as numeric or narrative limits for specific parameters, describe the water quality necessary to maintain these uses for surface water and ground water. Florida's surface water is protected for five designated use classifications, as follows:

Class I	***Potable water supplies***
Class II	***Shellfish propagation or harvesting***
Class III	***Recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife***
Class IV	***Agricultural water supplies***
Class V	***Navigation, utility, and industrial use (there are no state waters currently in this class)***

Florida Watershed Restoration Act

In 1998, the EPA settled a lawsuit with the environmental group Earthjustice over Florida's TMDL Program. The Consent Decree resulting from the lawsuit requires all TMDLs on the state's 1998 Section 303(d) list of impaired waters to be developed in thirteen years. If the state fails to develop the TMDLs, the EPA is required to do so.

In response to concerns about the TMDL lawsuit and in recognition of the important role that TMDLs play in restoring state waters, the 1999 Florida legislature enacted the Florida Watershed Restoration Act (Chapter 99-223, Laws of Florida). The act clarified the Department's statutory authority to establish TMDLs, required the Department to develop a methodology for identifying impaired waters, specified that the Department could develop TMDLs only for waters on a future state list of impaired waters developed using this new methodology, and directed the Department to establish an Allocation Technical Advisory Committee to address the allocation process for TMDLs. The act also declared Lake Okeechobee impaired and, as required under the TMDL Consent Decree, allowed the state to develop a TMDL for the lake (see **Noteworthy** for a description of the legislation's major provisions).

NOTEWORTHY: THE FLORIDA WATERSHED RESTORATION ACT

The Florida Watershed Restoration Act contains the following major provisions:

- *Establishes that the 303(d) list submitted to the EPA in 1998 is for planning purposes only.*
- *Requires the Department to adopt 303(d) listing criteria (that is, the methodology used to define impaired waters) by rule.*
- *Requires the Department to verify impairment and then establish a Verified List for each basin. The Department must also evaluate whether proposed pollution control programs are sufficient to meet water quality standards, list the specific pollutant(s) and concentration(s) causing impairment, and adopt the basin-specific 303(d) list by Secretarial Order.*
- *Requires the Department's Secretary to adopt TMDL allocations by rule. The legislation requires the Department to establish "reasonable and equitable" allocations of TMDLs, but does not mandate how allocations will be made among individual sources.*
- *Requires that TMDL allocations consider existing treatment levels and management practices; the differing impacts that pollutant sources may have; the availability of treatment technologies, best management practices (BMPs), or other pollutant reduction measures; the feasibility, costs, and benefits of achieving the allocation; reasonable time frames for implementation; the potential applicability of moderating provisions; and the extent that nonattainment is caused by pollutants from outside Florida, discharges that have ceased, or alteration to a waterbody.*
- *Required a report to the legislature by February 2001 addressing the allocation process.*

- *Authorizes the Department to develop basin plans to implement TMDLs, coordinating with the water management districts, the Florida Department of Agriculture and Consumer Services (DACS), the Soil and Water Conservation Districts, regulated parties, and environmental groups in assessing waterbodies for impairment, collecting data for TMDLs, developing TMDLs, and conducting at least one public meeting in the watershed. Implementation is voluntary if not covered by regulatory programs.*

- *Authorizes the Department and DACS to develop interim measures and BMPs to address nonpoint sources. While BMPs would be adopted by rule, they will be voluntary if not covered by regulatory programs. If they are adopted by rule and the Department verifies their effectiveness, then implementation will provide a presumption of compliance with water quality standards.*

- *Directs the Department to document the effectiveness of the combined regulatory/voluntary approach and report to the legislature by January 1, 2005. The report will include participation rates and recommendations for statutory changes.*

Determining Impairment Based on the State's Impaired Surface Waters Rule

Section 303(d) of the federal Clean Water Act and the Florida Watershed Restoration Act describe impaired waters as those waterbodies or waterbody segments that do not meet applicable water quality standards. "Impairment" is a broad term that includes designated uses, water quality criteria, the Florida antidegradation policy, and moderating provisions (see **Noteworthy** for explanations of these terms).

The state's Identification of Impaired Surface Waters Rule (Rule 62-303, Florida Administrative Code [F.A.C.]) was developed in cooperation with a Technical Advisory Committee and adopted by the Florida Environmental Regulation Commission on April 26, 2001. It provides a science-based methodology for evaluating water quality data in order to identify impaired waters, and it establishes specific criteria for impairment based on chemical parameters, the interpretation of narrative nutrient criteria, biological impairment, fish consumption advisories, and ecological impairment. The complete text of the rule is available at http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf.

The Impaired Surface Waters Rule also establishes thresholds for data sufficiency and data quality, including the minimum sample size required and the number of exceedances of the applicable water quality standard for a given sample size that identify a waterbody as impaired. The number of exceedances is based on a statistical approach designed to provide greater confidence that the outcome of the water quality assessment is correct. **Waters that are identified as impaired through the Impaired Surface Waters Rule are prioritized for TMDL development and implementation**.

NOTEWORTHY: EXPLANATION OF TERMS

- ***Designated uses,*** *discussed in an earlier sidebar, comprise the five classifications applied to each of the state's surface waterbodies.*
- ***Water quality criteria*** *comprise numeric or narrative limits of pollutants.*
- ***The Florida Antidegradation Policy*** *(Sections 62-302.300 and 62-4.242, F.A.C.) recognizes that pollution that causes or contributes to new violations of water quality standards or to the continuation of existing violations is harmful to the waters of the state. Under this policy, the permitting of new or previously unpermitted existing discharges is prohibited where the discharge is expected to reduce the quality of a receiving water below the* ***classification*** *established for it. Any lowering of water quality caused by a new or expanded discharge to surface waters must be in the public interest (that is, the benefits of the discharge to public health, safety, and welfare must outweigh any adverse impacts on fish and wildlife or recreation). Further, the permittee must demonstrate that other disposal alternatives (for example, reuse) or pollution prevention are not economically and technologically reasonable alternatives to the surface water discharge.*
- ***Moderating provisions*** *(provided in Subsection 62-302.300[10] and Rules 62-4 and 62-6, F.A.C., and described in Sections 62-302.300, 62-4.244, 62-302.800, 62-4.243, F.A.C., and Sections 403.201 and 373.414, Florida Statutes [F.S.]) include mixing zones, zones of discharge, site-specific alternative criteria, exemptions, and variances. These provisions are intended to moderate the* ***applicability*** *of water quality standards where it has been determined that, under certain special circumstances, the social, economic, and environmental costs of such* ***applicability*** *outweigh the benefits.*

Determining impairment in individual waterbodies takes place in two phases. First, in each river basin the Department evaluates the existing water quality data, using the methodology prescribed in the Impaired Surface Waters Rule, to determine whether waters are potentially impaired. Waters found to be potentially impaired are included on a *Planning List* for further assessment under Subsections 403.067(2) and (3), F.S. As required by Subsection 403.067(2), F.S., the Planning List is not used to administer or implement any regulatory program. It is submitted to the EPA for informational purposes only.

The second step is to assess waters on the Planning List under Subsection 403.067(3), F.S., as part of the Department's watershed management approach (described in the following section). The Department carries out additional data gathering and strategic monitoring, focusing on these potentially impaired waters, and determines—using the methodology in Part III, Section 62-303.400, F.A.C.—if a waterbody is, in fact, impaired and if the impairment is caused by pollutant discharges.

A Water Quality Assessment Report is produced containing the results of this updated evaluation and a *Verified List* of impaired waters. The criteria for the Verified List are more stringent than those for the Planning List. The Department is required to develop TMDLs for waters on the Verified List under Subsection 403.067(4), F.S. A watershed management plan (called a Basin Management Action Plan, or B-MAP) to

reduce the amount of pollutants that cause impairments must also be produced and implemented.

The Verified List is adopted by Secretarial Order in accordance with the Florida Watershed Restoration Act. Once adopted, the list is submitted to the EPA for approval as the state's Section 303(d) list of impaired waters for the basin.

Implementing Total Maximum Daily Loads

The Watershed Management Approach

The Department's statewide approach to water resource management, called the watershed management approach, is the framework for implementing TMDLs as required by the federal and state governments. The approach does not focus on individual causes of pollution. Instead, each basin is assessed as an entire functioning system, and aquatic resources are evaluated from a basinwide perspective that considers the cumulative effects of human activities. Water resources are managed on the basis of natural boundaries, such as river basins, rather than political or regulatory boundaries. Federal, state, regional, tribal, and local governments identify watersheds not meeting clean water or other natural resource goals and work cooperatively to focus resources and implement effective strategies to restore water quality. Extensive public participation in the decision-making process is crucial.

The watershed management approach is not new, nor does it compete with or replace existing programs. Rather than relying on single solutions to water resource issues, it is intended to improve the health of surface water and ground water resources by strengthening coordination among such activities as monitoring, stormwater management, wastewater treatment, wetland restoration, land acquisition, and public involvement.

By promoting the management of entire natural systems and addressing the cumulative effects of human activities on a watershed basis, this approach is intended to protect and enhance the ecological structure, function, and integrity of Florida's watersheds. It provides a framework for setting priorities and focusing the Department's resources on protecting and restoring water quality, and aims to increase cooperation among state, regional, local, and federal interests. By emphasizing public involvement, the approach encourages stewardship by all Floridians to preserve water resources for future generations.

The watershed approach is intended to speed up projects by focusing funding and other resources on priority water quality problems, strengthening public support, establishing agreements, and funding multiagency projects. It avoids duplication by building on existing assessments and restoration activities and promotes cooperative monitoring programs. It encourages accountability for achieving water quality improvements through improved monitoring and the establishment of TMDLs.

The Watershed Management Cycle

As part of the Department's watershed management approach, TMDLs will be developed, and the corresponding pollutant loadings allocated, as part of a watershed management cycle that rotates through the state's 52 river basins over a 9-year period. The cycle's five phases are as follows:

- ***Phase 1: Preliminary Watershed Evaluation.*** For each river basin, a **Basin Status Report** is developed, containing a *Planning List* of potentially impaired waters that may require the establishment of TMDLs. The report characterizes each basin's hydrologic, ecological, and socioeconomic setting as well as historical, current, and proposed watershed management issues and activities. It also contains a preliminary evaluation of major water quality parameters, water quality issues by planning unit, ecological resources, and basinwide pollutant loading trends related to land uses. At the end of Phase 1, a **Strategic Monitoring Plan** is developed.

- ***Phase 2: Strategic Monitoring and Assessment.*** Additional data are collected through strategic monitoring and uploaded to STORET. The data are used to verify whether potentially impaired waters in each basin are impaired and to calibrate and verify models for TMDL development. At the end of Phase 2, a **Water Quality Assessment Report** is produced for each basin that contains a Verified List of impaired waters. The report also provides an updated and more thorough evaluation of water quality, associated biological resources, and current management plans. The Department will adopt the *Verified List* through a Secretarial Order and submit it to the EPA as the state's Section 303(d) list of impaired waters.

- ***Phase 3: Development and Adoption of TMDLs.*** TMDLs for priority impaired waters in the basin will be developed and adopted by rule. Because TMDLs cannot be developed for all listed waters during a single watershed management cycle due to fiscal and technical limitations, waterbodies will be prioritized using the criteria in the Identification of Impaired Surface Waters Rule (Rule 62-303, F.A.C.).

- ***Phase 4: Development of a Basin Management Action Plan.*** A B-MAP will be developed for each basin to specify how pollutant loadings from point and nonpoint sources will be allocated and reduced in order to meet TMDL requirements. The plans will include regulatory and nonregulatory (i.e., voluntary) and structural and nonstructural strategies, and existing management plans will be used where feasible. The involvement and support of affected stakeholders in this phase will be especially critical.

- ***Phase 5: Implementation of a Basin Management Action Plan.*** Implementation of the activities specified in the B-MAP will begin. This includes carrying out rule development as needed, securing funding, informing stakeholders and the public, and monitoring and evaluating the implementation of the plan.

To implement the watershed cycle, the state's river basins have been divided into five groups within each of the Department's six districts statewide, and each district will assess one basin each year. **Table A.1** shows the basin groups for implementing the cycle in the Department's districts, and **Figure A.1** shows these groups and the rotating cycle in the districts. **Table A.2,** which lists the basin rotation schedule for TMDL development and implementation, shows that it will take nine years to complete one full cycle of the state.

The watershed management cycle is an iterative, or repeated, process. One of its key components is that the effectiveness of management activities (TMDL implementation) will be monitored in successive cycles. Monitoring conducted in Phase 2 of subsequent cycles will be targeted at evaluating whether water quality objectives are being met and whether individual waters are no longer impaired. The Department also will track the implementation of scheduled restoration activities, whether required or voluntary, to ensure continued progress towards meeting the TMDLs.

Table A.1: Basin Groups for Implementing the Watershed Management Cycle, by Department District Office

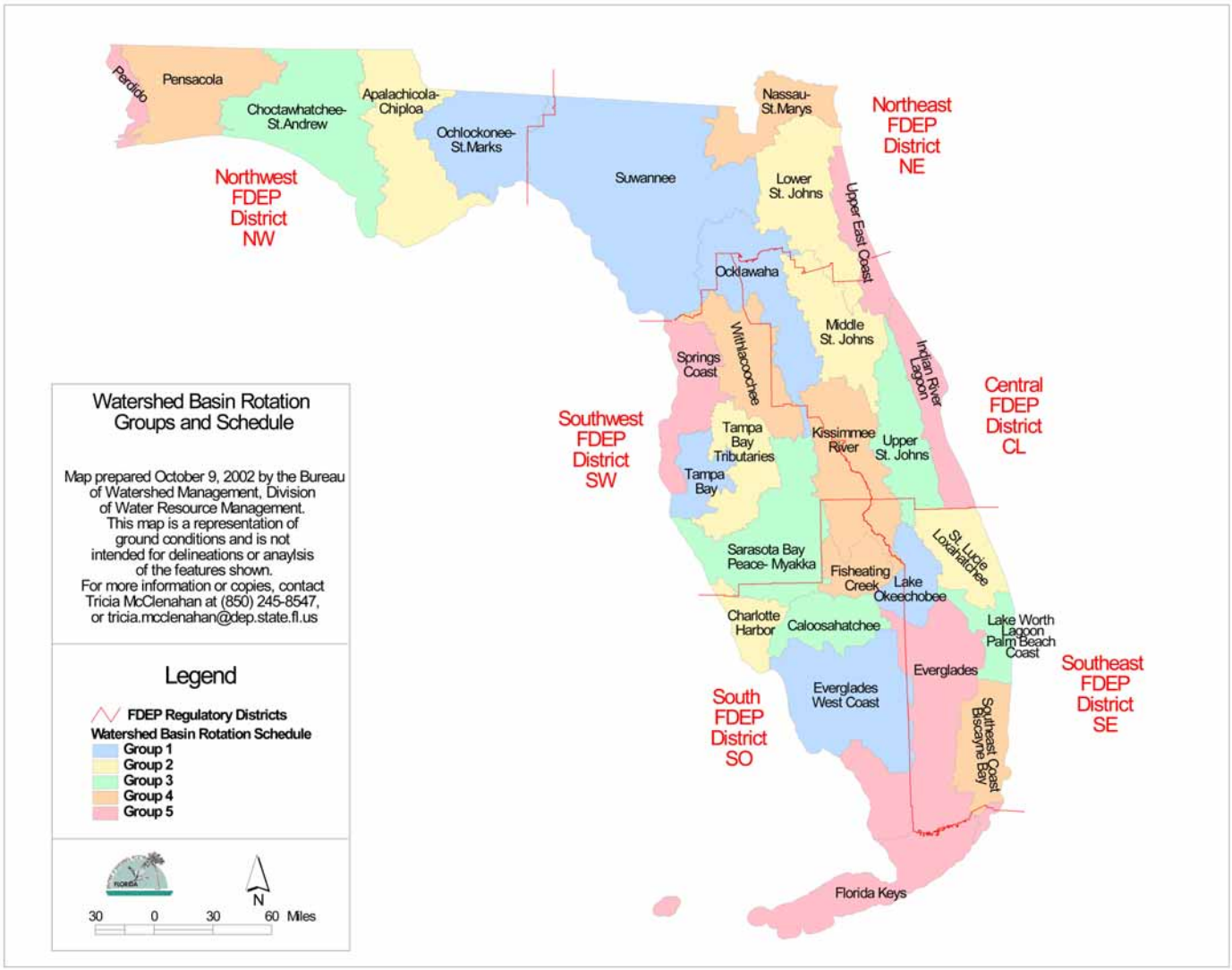
District	Group 1 Basins	Group 2 Basins	Group 3 Basins	Group 4 Basins	Group 5 Basins
Northwest	Ochlockonee–St. Marks Rivers	Apalachicola–Chipola Rivers	Choctawhatchee River and Bay and St. Andrews Bay	Pensacola Bay	Perdido River and Bay
Northeast	Suwannee River	Lower St. Johns River		St. Marys–Nassau Rivers	Northeast Coast Lagoons
Central	Ocklawaha River	Middle St. Johns River	Upper St. Johns River	Kissimmee River	Indian River Lagoon
Southwest	Tampa Bay	Tampa Bay Tributaries	Sarasota Bay and Peace–Myakka Rivers	Withlacoochee River	Springs Coast
South	Everglades West Coast	Charlotte Harbor	Caloosahatchee River	Fisheating Creek	Florida Keys
Southeast	Lake Okeechobee	St.Lucie–Loxahatchee Rivers	Lake Worth Lagoon/Palm Beach Coast	Southeast Urban Coast	Everglades

Table A.2: Basin Rotation Schedule for TMDL Development and Implementation

Year	00 01	01 02	02 03	03 04	04 05	05 06	06 07	07 08	08 09	09 10
Group 1	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5
Group 2		PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2	PHASE 3	PHASE 4
Group 3			PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2	PHASE 3
Group 4				PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1	PHASE 2
Group 5					PHASE 1	PHASE 2	PHASE 3	PHASE 4	PHASE 5	PHASE 1
	1st Five-Year Cycle – High-Priority Waters					2nd Five-Year Cycle – Medium-Priority Waters				

Note: Projected years for Phases 3, 4, and 5 may change due to accelerated local activities, length of plan development, legal challenges, etc.

Figure A.1: Five-Year Rotating Basin Cycle in the Department's Six Districts



Pollutants can enter a waterbody through point source discharges (generally from a specific facility) or nonpoint discharges (e.g., stormwater runoff, septic tanks). Government agencies, businesses, organizations, and individuals who contribute to these discharges will be asked to share the responsibility of attaining TMDLs through load allocations (the amount of a specified pollutant allotted for discharge) that are based on an established TMDL. **Table A.3** summarizes these potentially affected stakeholders, and the actions they may be asked to take to help achieve a TMDL.

Table A.3: Potentially Affected Stakeholders and Actions To Achieve TMDLs

Potentially Affected Stakeholders	Actions To Achieve TMDL
Municipal stormwater/wastewater programs	Reduce and treat urban stormwater runoff through stormwater retrofits, replacement of septic tanks
Commercial developers, homebuilders, individual homeowners	Improve development design and construction, enhance BMPs, replace septic tanks
Municipal and industrial wastewater treatment facilities, National Pollutant Discharge Elimination System (NPDES) permitted facilities	Reduce pollutant loadings from permitted discharges
Farming and silviculture operations	Reduce and treat runoff through BMPs
Federal, regional, state agencies; regional and local water quality coalitions	Carry out waterbody restoration projects

Permitting and Other Approaches

NPDES Permits

All point sources that discharge to surface waterbodies require a National Pollutant Discharge Elimination System (NPDES) permit. These permits can be classified into two types: domestic or industrial wastewater discharge permits, and stormwater permits. NPDES-permitted point sources may be affected by the development and implementation of a TMDL. All NPDES permits include "reopener clauses" that allow the Department to incorporate new discharge limits when a TMDL is established. These new limitations may be incorporated into a permit when a TMDL is implemented or at the next permit renewal, depending on the timing of the permit renewal and workload. For NPDES municipal stormwater permits, the Department intends to insert the following statement once a B-MAP is completed:

"The permittee shall undertake those activities specified in the (Name of Waterbody) Basin Management Action Plan in accordance with the approved schedule set forth in the B-MAP."

Domestic and Industrial Wastewater Permits

In addition to NPDES-permitted facilities, all of which discharge to surface waters, Florida also regulates domestic and industrial wastewater discharges to ground water via land application. Since ground water and surface water are so intimately linked in much of the state, reductions in loadings from these facilities may be needed to meet TMDL limitations for pollutants in surface waters. If such reductions are identified in the B-MAP, they would be implemented through modifications of the existing state permits.

Florida Stormwater/Environmental Resource Permits

With the implementation of the state's stormwater treatment rule in 1982, Florida became the first state to require the treatment of stormwater from all new development. Today, except in the area served by the Northwest Florida Water Management District, new development projects receive an Environmental Resource Permit that combines stormwater flood protection, stormwater treatment, and wetland protection/mitigation into a single permit. These permits are designed to obtain 80 percent average annual load reduction of total suspended solids. This level of treatment may need to be increased, depending on the allocation of load reductions, especially for nutrients. For example, the St. Johns River Water Management District recently adopted basin-specific criteria for the Lake Apopka Basin that require the phosphorus loading from new development not to exceed predevelopment phosphorus loading.

Local Land Development Codes

Since structural stormwater treatment practices can only achieve certain levels of load reductions, and because the hydrologic changes accompanying urban development often cause ecological impacts to aquatic systems, local land development codes that promote "low-impact development" are an important component of restoring impaired waters. Local codes may need to be reviewed to determine how to promote developments that minimize impervious surfaces (such as reduced street widths or the use of pervious pavements), promote the protection of vegetation, promote the protection and restoration of riparian buffers along streams and lakes, and adopt the principles of the Florida Yards and Neighborhoods Program in local landscaping codes.

Best Management Practices

Typically, BMPs refer to a practice or combination of practices that, based on sound science and best professional judgment, are determined to be the most effective and practicable means of reducing nonpoint source pollutant discharges and improving water quality. Both economic and technological considerations are included in the evaluation of what is practicable. BMPs may include structural controls (such as retention areas or detention ponds) or nonstructural controls (such as street sweeping or public education). Many BMPs have been developed for urban stormwater to reduce pollutant loadings and peak flows. These BMPs accommodate site-specific conditions, including soil type, slope, depth to ground water, and the designation of receiving waters.

The passage of the Florida Watershed Restoration Act increased the emphasis on implementing BMPs to reduce nonpoint source pollutant discharges from agricultural operations. Recognizing that the development and adoption of BMPs might take several years, the legislature authorized the use of Interim Measures (IMs) during the BMP development process for agricultural operations. In essence, IMs are a set of logical conservation practices designed to reduce agricultural nonpoint pollutant discharges based on current knowledge and best professional judgment. These practices will evolve into more formal BMPs as better scientific data on their effectiveness is obtained.

Once the Florida Department of Agriculture and Consumer Services adopts BMPs, the Department is charged with verifying their effectiveness in reducing agricultural nonpoint sources. Once verified, agricultural operations that have implemented BMPs will receive a waiver of liability and presumption of compliance similar to that granted a developer who obtains an Environmental Resource Permit.

Other Strategies

The success of implementing nonpoint source TMDL load allocations will require variety, creativity, stakeholder commitment to watershed management, and personal stewardship. In addition to BMPs, other possible strategies for meeting TMDLs, restoring water quality, and preventing the further degradation of Florida's watersheds include cost sharing, waste minimization, pollution prevention, new approaches to land use design and development, and pollutant trading. The Department will assemble a Technical Advisory Committee to help develop a pollutant-trading rule, which must be reviewed by the legislature prior to its adoption. The Department will also continue to work with local stakeholders on TMDL allocation issues and implementation plans.

Sources of Information

For additional information on the Department's Watershed Management Program and TMDLs, please contact the following basin coordinators:

- Southwest Florida, Greater Everglades and Florida Keys, Pat Fricano (850) 245-8559
- Southeast Florida, Kevin O'Donnell (850) 245-7607
- Northwest and Central Florida, Mary Paulic, (850) 245-8560
- Northeast Florida and Suwannee Basin, Jennifer Gihring 245-8418
- West Central Florida and Tampa Bay Region, Tom Singleton (850) 245-8561

For information on establishing and implementing TMDLs, contact Jan Mandrup-Poulsen at (850) 245-8448. Additional information is available on the Department's Web site at www.dep.state.fl.us/water/watersheds/index.htm.

Appendix B: Supplementary Ecological Information on the Caloosahatchee Basin

The Caloosahatchee Basin lies completely within the Southwestern Florida Flatwoods subregion of the Southern Coastal Plain Ecoregion. Ecoregions are regions of relative ecological homogeneity for factors such as climate, physiography, geology, soils, and vegetation. The Southwestern Florida Flatwoods subregion is characterized by pine flatwoods, extensive areas of pasture and rangeland, cabbage palm hammocks, and marshes. These natural communities support diverse animal and plant life. **Table B.1** describes the acreage and types of natural communities in the basin.

Table B.1: Types of Natural Communities in the Caloosahatchee Basin

Ecological Community	Acres	Percent Area
Coastal Strand	0	0.0
Dry Prairie	138,474	16.1
Pinelands	124,633	14.5
Sand Pine Scrub	0	0.0
Sand Hill	0	0.0
Xeric Oak Scrub	45	0.0
Mixed Hardwood Pine	2,081	0.2
Hardwood Hammock	35,853	4.2
Tropical Hammock	0	0.0
Salt Marsh	1,921	0.2
Freshwater Marsh	47,812	5.6
Cypress Swamp	18,695	2.2
Hardwood Swamp	375	0.0
Bay Swamp	0	0.0
Shrub Swamp	2,832	0.3
Mangrove	1,944	0.2
Bottomland Hardwood	0	0.0
Water	25,688	3.0
Grassland And Agriculture	257,580	30.0
Shrub And Brush	56,564	6.6
Exotic Plant Communities	681	0.1
Barren Land	142,588	16.6
BASIN TOTAL	**857,766**	**100.0**

Appendix C: Information on Reasonable Assurance

TO: **Interested Parties**

FROM: **Mimi Drew, Director**
Division of Water Facilities

DATE: **September 2002**

SUBJECT: **Guidance for Development of Documentation To Provide Reasonable Assurance that Proposed Pollution Control Mechanisms Will Result in the Restoration of Designated Uses in Impaired Waters**

The purpose of this memo is to describe the types of information that should be considered, and subsequently documented, when evaluating whether there is sufficient reasonable assurance that:

1. Proposed pollution control mechanisms (typically described in watershed management or restoration plans) addressing impaired waters will result in the attainment of applicable water quality standards (designated uses) at a clearly defined point in the future, and

2. Reasonable progress towards restoration of designated uses will be made by the time the next 303(d) list of impaired waters is due to be submitted to the EPA.

There are many site-specific issues related to determining whether reasonable assurance has been provided. Accordingly, this document describes the elements or issues that should be considered when evaluating a submittal or when documenting the basis for the Department's decision, rather than attempting to establish specific criteria on what constitutes reasonable assurance.

It should be noted that the term "reasonable assurance" is used throughout many Department programs and rules, and this guidance specifically addresses the issues related to the "reasonable assurance" provided by proposed pollution control mechanisms. This guidance should not be used to evaluate the meaning of reasonable assurance in other contexts, particularly in permitting decisions.

Background

The Impaired Surface Waters Rule (IWR), Rule 62-303, F.A.C. (Identification of Impaired Surface Waters), establishes a formal mechanism for identifying surface waters in Florida that are impaired (do not meet applicable water quality standards) by pollutants. Most waters that are verified as being impaired by a pollutant will be listed on

the state's 303(d) list pursuant to the Florida Watershed Restoration Act (FWRA) and Section 303(d) of the Clean Water Act. Once listed, Total Maximum Daily Loads (TMDLs) will be developed for the pollutants causing the impairment of the listed waters. However, as required by the FWRA, the Department will evaluate whether existing or proposed pollution control mechanisms will effectively address the impairment before placing a water on the state's Verified List. If the Department can document there is reasonable assurance that the impairment will be effectively addressed by the control measure, then the water will not be listed on the final Verified List (other impaired waters that will not be listed include waters with TMDLs and waters impaired by pollution).

Current Rule Text Relating to Evaluation of Pollution Control Mechanisms

The rule text addressing the evaluation of proposed pollution control mechanisms is as follows:

Section 62-303.600, Evaluation of Pollution Control Mechanisms

3. Upon determining that a waterbody is impaired, the Department shall evaluate whether existing or proposed technology-based effluent limitations and other pollution control programs under local, state, or federal authority are sufficient to result in the attainment of applicable water quality standards.

4. If, as a result of the factors set forth in (1), the waterbody segment is expected to attain water quality standards in the future and is expected to make reasonable progress towards attainment of water quality standards by the time the next 303(d) list is scheduled to be submitted to EPA, the segment shall not be listed on the Verified List. The Department shall document the basis for its decision, noting any proposed pollution control mechanisms and expected improvements in water quality that provide reasonable assurance that the waterbody segment will attain applicable water quality standards.

Responsible Parties for Reasonable Assurance Demonstration

It is ultimately the Department's responsibility to assure adequate documentation in the administrative record whenever the Department decides to not list an impaired waterbody segment for a given pollutant. This documentation will be very important because the Verified Lists will be adopted by Order of the Secretary and third parties will be provided an opportunity to challenge, via an administrative hearing, all listing decisions (both those listing a water and those to not list a water for a given pollutant). However, the Department expects that local stakeholders will often offer to prepare the necessary documentation to demonstrate reasonable assurance that proposed control mechanisms will restore a given waterbody. The Department will provide guidance to stakeholders on what information is needed and how it should be submitted.

Time Frame for Development of Documentation

The Department plans to prepare basin-specific Verified Lists as part of its watershed management cycle, which rotates through all of the state's basins over a five-year, five-phased cycle[1]. During the first phase of the cycle, the Department will assess water quality in the basin and prepare a draft Planning List of potentially impaired waters. The Department and interested parties will then have approximately one year (Phase 2) to monitor waters on the planning list and prepare documentation, as appropriate, to provide reasonable assurance that impaired waters will be restored. The Department will review submittals from interested parties during Phase 2, before adopting the Verified List for the basin containing the waterbody segment in question.

What It Means To Be Under Local, State, or Federal Authority

Both the FWRA and the IWR require that the pollution control programs under consideration be "under local, state, or federal authority." A pollution control program will be considered "under local, state, or federal authority" if the program is subject to or required by a local ordinance, state statute or rule, or federal statute or regulation.

Programs will also be considered under local, state, or federal authority if they are subject to a written agreement, signed by both local stakeholders and at least one governmental entity, that includes measurable goals, performance criteria, benchmarks, and back-up corrective actions to assure the further progress of the program. It is important to note that these written agreements do not need to be enforceable for nonregulated nonpoint sources.

Many nonpoint sources are currently outside of the regulatory programs of EPA, the Department, and the water management districts, and reductions at these nonpoint sources will be voluntary. In fact, pollution control mechanisms for these nonpoint sources would be voluntary even if a TMDL were developed. As such, these agreements may provide the same level of reasonable assurance that can be provided for a TMDL implementation plan as long as they maintain the Department's enforcement capability over all point sources involved.

Time Frame for Attaining Water Quality Standards

The FWRA and the IWR do not establish a specific time limit by which waters must attain applicable water quality standards or designated uses. However, the pollution control mechanisms or watershed restoration plan must provide reasonable assurance that designated uses will be met at some time **in the future**. As such, the documentation submitted to the Department must provide a specific date by which time designated uses are expected to be restored. In cases where designated uses will not be met for many

[1] Federal regulations currently call for state 303(d) lists every two years, but Florida plans to submit annual updates based on the basin-specific Verified Lists.

years, the documentation should also provide justification as to why the specified time is needed to restore designated uses.

Parameter-Specific Nature of Demonstration

For the Department not to place an impaired waterbody segment on the Verified List, reasonable assurance must be provided for each pollutant that has been documented to be causing impairment of the waterbody segment. However, some entities, including the Department, may want to provide reasonable assurance addressing only selected pollutants, which could result in the Department not listing the waterbody segment for those pollutants, but still listing it for others. In this event, TMDLs will only be developed for the remaining listed pollutants.

Information To Consider and Document when Assessing Reasonable Assurance in the IWR

To provide reasonable assurance that existing or proposed pollution control mechanisms will restore designated uses, the following information should be evaluated and documented for the Administrative Record:

5. **A Description of the Impaired Water**—name of the water listed on the Verified List, the location of the waterbody and watershed, the watershed/8-digit cataloging unit code, the NHD identifier (when they become available), the type (lake, stream, or estuary) of water, the water use classification, the designated use not being attained, the length (miles) or area (acres) of impaired area, the pollutant(s) of concern (those identified as causing or contributing to the impairment), and the suspected or documented source(s) of the pollutant(s) of concern.

6. **A Description of the Water Quality or Aquatic Ecological Goals**—a description of the water quality–based targets or aquatic ecological goals (both interim and final) that have been established for the pollutant(s) of concern, the averaging period for any numeric water quality goals, a discussion of how these goals will result in the restoration of the waterbody's impaired designated uses, a schedule indicating when interim and final targets are expected to be met, and a description of procedures (with thresholds) to determine whether additional (backup) corrective actions are needed.

7. **A Description of the Proposed Management Actions To Be Undertaken**—names of the responsible participating entities (government, private, others), a summary and list of existing or proposed management activities designed to restore water quality, the geographic scope of any proposed management activities, documentation of the estimated pollutant load reduction and other benefits anticipated from implementation of individual management actions, copies of written agreements committing participants to the management actions,

a discussion on how future growth and new sources will be addressed, confirmed sources of funding, an implementation schedule (including interim milestones and the date by which designated uses will be restored), and any enforcement programs or local ordinances, if the management strategy is not voluntary.

8. **A Description of Procedures for Monitoring and Reporting Results**—a description of the water quality monitoring program to be implemented (including station locations, parameters sampled, and sampling frequencies) to demonstrate reasonable progress; quality assurance/quality control elements that demonstrate the monitoring will comply with Rule 62-160, F.A.C.; procedures for entering all appropriate data into STORET; the responsible monitoring and reporting entity; the frequency and format for reporting results; the frequency and format for reporting on the implementation of all proposed management activities; and methods for evaluating progress towards goals.

9. **A Description of Proposed Corrective Actions**—a description of proposed corrective actions (and any supporting document[s]) that will be undertaken if water quality does not improve after implementation of the management actions or if management actions are not completed on schedule, and a process for notifying the Department that these corrective actions are being implemented.

Water Quality–Based Targets and Aquatic Ecological Goals

Some of the most important elements listed above are the requirements to provide water quality–based targets or aquatic ecological goals and a discussion on how resultant pollutant(s) reduction targets/goals will result in restoration of designated uses. Some people have expressed concern about these targets because they equate a water quality–based restoration target with a TMDL (thus assuming a "Catch 22" that a TMDL is needed to make a demonstration that a TMDL is not needed). However, as is also the case for TMDLs, water quality–based targets can take many forms, and need not be a result of a complex hydrodynamic/water quality model.

In some cases, there may be sufficient historical data (paleolimnological data, loadings from periods predating the impairment, or baseline data for Outstanding Florida Waters[2], for example) that could be used to determine an appropriate water quality target. In other cases, simplified modeling (including regression analysis) may allow for conservative estimates of the assimilative capacity that could then be used as the basis for restoration goals. And, finally, a water quality target may have been developed that would be scientifically equivalent to (or act as the basis for) a TMDL, but the target has not been administratively adopted as a TMDL. In each of these cases, a sound water quality target could be used to evaluate whether the proposed pollution control mechanisms will sufficiently reduce loadings to meet the assimilative capacity of the water in question and result in attainment of designated uses.

[2] Baseline data would be data for the year prior to designation of the OFW.

Interim Targets

Because it will usually take many years to restore fully the designated uses of an impaired water, interim water quality targets will often be needed to measure whether reasonable progress is being made towards the restoration of designated uses. Examples of such interim targets are provided in the last section of this document, but site-specific measures are also encouraged.

Averaging Periods for Water Quality Targets

While the averaging period for water quality–based targets should be consistent with how the underlying standard is expressed, they can often be expressed in a variety of ways and need not be expressed as "daily loads." Annual averages or medians are often appropriate for some parameters, but shorter-term (seasonal, for example) averages may be necessary if the impairment is limited to specific seasons or parts of the year. Multi-year averages may be appropriate in limited circumstances where there is naturally high variation of the water quality target.

Estimates of Pollutant Reductions from Restoration Actions

It will often be difficult to estimate precisely the pollutant reductions that will result from specific restoration activities. This is particularly true for the implementation of best management practices (BMPs). However, to provide reasonable assurance that a BMP or other restoration action will reduce loadings of the pollutant of concern to a level that will restore the water's designated uses, documentation should address how the reductions were calculated, including providing documented values from the scientific literature for reductions attributed to similar management actions. If the expected reductions are expressed as a range, the midpoint of the range should be used as the basis for estimating reductions, unless documentation is provided supporting the use of different removal efficiencies in this specific application.

New Sources/Growth

Another key element is the discussion on how future growth and new sources will be addressed. Restoration goals must address possible increased loadings of the pollutant of concern that are anticipated due to population growth or land use changes in contributing watersheds, both from point and nonpoint sources. This will be particularly important for waters impaired by nutrients, given that so many Florida watersheds are faced with continuing urban, residential, and agricultural development that results in increased nutrient loading from stormwater, septic tanks, and wastewater discharges.

Examples of Reasonable Progress

The determination of whether there will be reasonable progress towards attainment of water quality standards will be very site- and pollutant-specific. Documentation should be provided supporting specific progress towards restoration of the designated uses of the impaired water. Possible examples of reasonable progress include, but are not limited to the following:

- A written commitment to implement controls reducing loadings within a specified time frame from watershed stakeholders representing at least 50 percent of the anthropogenic load of the pollutant(s) of concern;
- Evidence of at least a 10 percent reduction (or alternatively, a percent reduction consistent with meeting the water quality target by the specified date) in annual anthropogenic loading of the pollutant(s) of concern;
- Evidence of at least a 10 percent decrease (or alternatively, a percent decrease consistent with meeting the water quality target by the specified date) in the annual average concentration of the pollutant(s) of concern in the water;
- Bioassessment results showing there has been an improvement in the health of the biological community of the water, as measured by bioassessment procedures similar to those used to determine impairment and conducted in similar conditions; or
- Adoption of a local ordinance that specifically provides water quality goals, restricts growth or loads tied to the pollutant(s) of concern, and provides an enforcement option if the proposed management measure(s) are not implemented as required.

Reasonable progress must be made by the time the next 303(d) list is due to be submitted to EPA, which is currently every two years. EPA has contemplated changing the listing cycle to every four or five years, and the IWR was specifically worded to allow a longer time frame for requiring reasonable progress in the event that the listing cycle changes.

Long-Term Requirements

If at any time the Department determines that reasonable assurance and reasonable progress are not being met, the order adopting the Verified List will be amended to include the waterbody on the Verified List for the pollutant(s) in question. Additional reasonable progress must be made each time a waterbody is considered for listing under Rule 62-303, F.A.C. (every five years).

If you have any questions about this guidance memo, contact Daryll Joyner of the Department's Bureau of Watershed Management in Tallahassee at 850-245-8431.

Appendix D: Methodology for Determining Impairment Based on the Impaired Surface Waters Rule

The Impaired Surface Waters Rule

To identify impaired waters in each of the state's river basins, the Department evaluates water quality data using the science-based methodology in the Identification of Impaired Surface Waters Rule (Rule 62-303, Florida Administrative Code [F.A.C.]). The rule establishes specific criteria and thresholds for impairment, in addition to data sufficiency and data quality requirements. The methodology described in the rule is based on a statistical approach designed to provide greater confidence that the outcome of the water quality assessment is correct. The complete text of the Impaired Surface Waters Rule is available at http://www.dep.state.fl.us/water/tmdl/docs/AmendedIWR.pdf.

As part of the watershed management approach, for each river basin in the state the Department will follow the methodology in Section 62-303.300, F.A.C., to develop a Planning List of potentially impaired waters to be assessed under Subsections 403.067(2) and (3), Florida Statutes [F.S.]. The methodology for developing the Planning List includes an evaluation of aquatic life use support, primary contact and recreational use support, fish and shellfish consumption use support, drinking water use support, and protection of human health. Data older than 10 years cannot be used to evaluate water quality criteria exceedances for the Planning List. As required by Subsection 403.067(2), F.S., the Planning List will not be used to administer or implement any regulatory program, and is submitted to the U.S. Environmental Protection Agency (EPA) for informational purposes only.

After further assessment, using the methodology in Part III, Section 62-303.400, F.A.C., the Department will determine if waters on the Planning List are, in fact, impaired and if the impairment is caused by pollutant discharges. These waters are placed on a Verified List. The criteria for the Verified List are more stringent than those for the Planning List. Data older than 7.5 years should not be used to verify impairment. The Verified List will be adopted by Secretarial Order and forwarded to the EPA for approval as Florida's Section 303(d) list of impaired waters. The Department will develop TMDLs for these waters under Subsection 403.067(4), F.S.

Attainment of Designated Use(s)

While the designated uses of a given waterbody are established using the surface water quality classification system described previously, it is important to note that the EPA uses slightly different terminology in its description of designated uses. Because the Department is required to provide use attainment status for both the state's 305(b) report and the state's 303(d) list of impaired waters, the Department uses EPA terminology when assessing waters for use attainment. The water quality evaluations and decision processes for listing impaired waters that are defined in Florida's Impaired Surface Waters Rule are based on the following designated use attainment categories:

Aquatic Life Use Support-Based Attainment
Primary Contact and Recreation Attainment
Fish and Shellfish Consumption Attainment
Drinking Water Use Attainment
Protection of Human Health

Table D.1 summarizes the designated uses assigned to Florida's various surface water classifications.

Table D.1: Designated Use Attainment Categories for Surface Waters in Florida

Designated Use Attainment Category Used in Impaired Surface Waters Rule Evaluation	Applicable Florida Surface Water Classification
Aquatic Life Use Support-Based Attainment	Class I, II, and III
Primary Contact and Recreation Attainment	Class I, II, and III
Fish and Shellfish Consumption Attainment	Class II
Drinking Water Use Attainment	Class I
Protection of Human Health	Class I, II, and III

Sources of Data

The Department's assessment of water quality for each basin statewide includes an analysis of quantitative data from a variety of sources, many of which are readily available to the public. These sources include the EPA's Legacy and modernized **STO**rage and **RET**rieval (STORET) databases, the U.S. Geological Survey (USGS), the Department, the Florida Department of Health (DOH), the water management districts, local governments, and volunteer monitoring groups.

Historically, the Department carried out statewide water quality assessments using data available in the EPA's Legacy STORET Database; STORET makes up approximately 60 percent of the statewide data used in the Impaired Surface Waters Rule assessment. The Legacy STORET dataset is a repository of data collected and uploaded by numerous organizations through 1999. The Legacy STORET Database can be accessed at http://www.dep.state.fl.us/water/storet/index.htm.

In 2000, the EPA created a modernized version of STORET that included new features designed to address data quality assurance/quality control concerns (see the new STORET Web site at http://www.epa.gov/storet/. However, because of software difficulties associated with batch uploading of data to the modernized STORET, the data being uploaded to the national repository decreased dramatically, and lingering problems have temporarily reduced STORET's importance as a statewide data source. It houses only about 5 percent of the statewide Impaired Surface Waters Rule Database.

Approximately 35 percent of the data used in the Impaired Surface Waters Rule assessment was provided by individual organizations that for various reasons, such as time constraints or resource limitations, were not able to enter their data into the national database. The organizations providing the largest datasets include the South Florida, Southwest Florida, and St. Johns River Water Management Districts; the USGS; and the University of Florida LakeWatch volunteer monitoring group. Several of these databases

are readily available to the public via the Internet: the South Florida Water Management District at http://www.envirobase.usgs.gov/, the USGS at http://water.usgs.gov/, and LakeWatch at http://lakewatch.ifas.ufl.edu/.

The Department created the Impaired Surface Waters Rule Database in 2002 to evaluate data simultaneously in accordance with the Impaired Surface Waters Rule methodology for every basin in the state, based on the appropriate data "window." For the Verified List assessment, the window is 7.5 years (for the Impaired Surface Waters Rule Database), and the Planning List assessment window is 10 years. **Table D.2** shows the periods of record for the Verified and Planning Lists for the five basin groups.

The evaluation of water quality in the state's basins also includes some qualitative information. These sources are described in the Basin Status Reports and Water Quality Assessment Reports for each basin.

Table D.2: Data Used in Developing the Planning and Verified Lists, First Basin Rotation Cycle

Basin Group	Reporting	Period of Data Record Used in Impaired Surface Waters Rule Evaluation
Group 1	Planning List	January 1, 1989 – December 31, 1998
	Verified List	January 1, 1995 – June 30, 2002
Group 2	Planning List	January 1, 1991 – December 31, 2000
	Verified List	January 1, 1996 – June 30, 2003
Group 3	Planning List	January 1, 1992 – December 31, 2001
	Verified List	January 1, 1997 – June 30, 2004
Group 4	Planning List	January 1, 1993 – December 31, 2002
	Verified List	January 1, 1998 – June 30, 2005
Group 5	Planning List	January 1, 1994 – December 31, 2003
	Verified List	January 1, 1999 – June 30, 2006

Note: Typically, a 10-year data record is used for the development of the Planning Lists, and a 7.5-year record is used for the Verified Lists.

Methodology

To determine the status of surface water quality in individual river basins in Florida, three categories of data—chemistry data, biological data, and fish consumption advisories—were evaluated to determine potential impairments for the four designated use attainment categories discussed earlier: aquatic life, primary contact and recreation, fish and shellfish consumption, drinking water use, and protection of human health.

Aquatic Life Based Attainment

The Impaired Surface Waters Rule follows the principle of independent applicability. A waterbody is listed for potential impairment of aquatic life use support based on exceedances of any one of four types of water quality indicators (numeric water quality criteria, nutrient thresholds, biological thresholds, and toxicity data).

EXCEEDANCES OF NUMERIC WATER QUALITY CRITERIA

The chemistry data from STORET used in evaluating impairment were also used for preparing the state's 305(b) report. Only ambient surface water quality stations were included in the assessment of impairment. Water quality information from point sources or wells was excluded. Monitoring stations were classified as one of five waterbody types—spring, stream, lake, estuary, or blackwater—based on criteria described in the latest 305(b) report. The assessments included the following parameters:

Metals	Arsenic, aluminum, cadmium, chromium VI, chromium III, copper, iron, lead, mercury, nickel, selenium, silver, thallium, and zinc
Nutrients	Chlorophyll *a* for streams and estuaries, and Trophic State Index (TSI) (chlorophyll *a,* total nitrogen, and total phosphorus) for lakes
Conventionals	Dissolved oxygen (DO), fecal coliforms, total coliforms, pH, unionized ammonia

The requirements for placing waters on the Planning List included a minimum of 10 temporally independent samples from the 10-year period of record shown in **Table D.2,** unless there were 3 exceedances of water quality or 1 exceedance of an acute toxicity criterion in a three-year period. The screening methodology for the Verified List requires at least 20 samples from the last 5 years preceding the Planning List assessment. An exceedance, meaning that water quality criteria or standards are not met, is recorded any time the criterion is exceeded by any amount. An exceedance for DO, however, means that a waterbody does not meet the DO criterion, rather than an actual exceedance of the criterion.

To determine if a water should be placed on the Planning List for each parameter, the chemical data were analyzed using a computer program written to assess the data, based on criteria established in the Impaired Surface Waters Rule, with two exceptions. First, unionized ammonia data were not analyzed by the program, but rather with an Excel spreadsheet. Second, because the full complexity of the pH criterion could not be programmed, the incomplete listings for pH are not included. They will be further examined while additional data are collected during Phase 2 of the watershed management cycle. Data analysis and statistical summaries of waterbody identification numbers (WBIDs), waterbody types, and parameters obtained from the STORET Database were conducted using Access, SAS statistical software, and ArcView GIS applications

The data for metals and conventional parameters were compared with the state surface water quality criteria in Section 62-302.530, F.A.C. (Identification of Impaired Surface Waters Rule). The rule contains a table of sample numbers versus exceedances. A waterbody was placed on the Planning List if there was at least 80 percent confidence

that the actual criteria exceedance rate was greater than or equal to 10 percent. To be placed on the Verified List, at least a 90 percent confidence rate was required.

Exceedances of Nutrient Thresholds

The state currently has a narrative nutrient criterion instead of a numeric value for nutrient thresholds. The narrative criterion states, "In no case shall nutrient concentrations of a body of water be altered so as to cause an imbalance in natural populations of aquatic flora or fauna." The Impaired Surface Waters Rule provides an interpretation of the narrative nutrient criterion. In general, the Trophic State Index (TSI) and the annual mean chlorophyll *a* values are the primary means for assessing whether a waterbody should be assessed further for nutrient impairment.

The rule also considers other information that might indicate an imbalance in flora or fauna due to nutrient enrichment, such as algal blooms, excessive macrophyte growth, a decrease in the distribution (either in density or aerial coverage) of seagrasses or other submerged aquatic vegetation, changes in algal species richness, and excessive diel oxygen swings.

Potential nutrient impairment was evaluated by calculating annual mean chlorophyll *a* values for estuaries and streams and the TSI for lakes. For lakes, the TSI was calculated using chlorophyll *a*, total phosphorus, and total nitrogen measurements. Direct evidence of imbalances of flora and fauna in waterbodies was also considered in the evaluation of nutrient impairments.

In estuarine areas, a water was considered nutrient enriched if the annual mean chlorophyll *a* values were greater than 11 micrograms per liter (μg/L) or if annual mean chlorophyll *a* values increased by more than 50 percent over historical values for at least two consecutive years. For streams, a water was considered nutrient enriched if the annual mean chlorophyll *a* values were greater than 20 μg/L or if the annual mean increased by more than 50 percent over historical values for at least two consecutive years.

A lake with a mean color greater than 40 platinum cobalt units (PCUs) was considered nutrient enriched if the annual mean TSI exceeded 60. A lake with a mean color less than or equal to 40 PCUs was considered nutrient enriched if the annual mean TSI exceeded 40. In addition, a lake was considered nutrient enriched if there was an increase in TSI over the 1989 to 2000 period or if TSI measurements were 10 units higher than historical values.

Exceedances of Biological Thresholds

Bioassessments were carried out for streams, lakes, canals, and rivers using the Impaired Surface Waters Rule as guidance and following the Department's standard operating procedures, which provide definitions and specific methods for the generation and analysis of bioassessment data. These are referenced in the individual bioassessment data tables contained in the Basin Status Reports. The purpose behind using a bioassessment methodology in surface water characterizations is that biological components of the environment manifest long-term water quality conditions and thus provide a better indication of a waterbody's true health than discrete chemical or physical

measurements alone. Similar to water quality criteria, bioassessment methods involve the identification of a biological reference condition, based on data from unimpaired or least impacted waters in a given region.

For the Planning and Verified List assessments, the reference condition data were used to establish expected scores, ranging from best to worst, for various measures of community structure and function, such as numbers or percentages of particular species or feeding groups. Data on community structure and function from waters of unknown quality in the same region as reference waters were compared with the expected scores of metrics to evaluate their biological integrity.

Metrics (e.g., number of taxa, percent Diptera, percent filter feeders) were used independently and as an aggregated group called an index. Indices have advantages over individual metrics in that they can integrate several related metrics into one score that reflects a wider range of biological variables. A number of bioassessment metrics and indices exist for assessing populations of plant and animal life, including fish, diatoms (e.g., microscopic algae and unicellular plankton), and macroinvertebrates (e.g., insects, crayfish, snails, and mussels).

Only macroinvertebrate data from ambient sites in state surface waters were used in the bioassessments analyzed for the Planning and Verified Lists. The data included sites designated as test and background sites for NPDES fifth-year inspections, but excluded data from effluent outfalls from discharging facilities or data from monitoring sites not clearly established to collect ambient water quality data. Because site-specific habitat and physicochemical assessment information (e.g., percent suitable macroinvertebrate habitat, water velocities, extent of sand or silt smothering, and riparian *[Definition: Of, on, or relating to the banks of a natural course of water.]* buffer zone widths) was not available at the time of reporting, it was not included. However, this information is instrumental in pinpointing the causes for failed bioassessment metrics and will be included in future reporting.

The data used to develop the Planning and Verified Lists were obtained from the Department's Biological Database (SBIO) and the EPA's STORET Water Quality Database, where it could be substantiated that the data were generated in compliance with the bioassessment standard operating procedures referenced in the Impaired Surface Waters Rule (Section 62-303.330, F.A.C.).

The data from these databases are used without regard to the randomness of sample site selection. For the purposes of the Basin Status Reports, the seasons are defined as follows: winter (1/1–3/31), spring (4/1–6/30), summer (7/1–9/30), and fall (10/1–12/31). Wet seasons are generally spring and summer, and dry seasons are fall and winter, although conditions can vary in the state as a whole.

Lake Condition Index

The scoring of the individual metrics of the Lake Condition Index (LCI), except percent Diptera, was performed according to the following formula:

100(B/A) where A = the 95 percentile of the reference population and B = observed value

For percent Diptera, the following formula was used:

100 (100-B)/(100-A) where A = the 95 percentile of the reference population and B = observed value

An average LCI score was calculated by averaging the scores of the six metrics in the method: total number of taxa; total number of taxa belonging to the orders Ephemeroptera, Odonata, and Trichoptera (EOT taxa); percent EOT taxa; Shannon-Wiener Diversity Index score; Hulbert Index score; and percent Dipteran individuals. LCI calculations were only provided for clear lakes (≤ 20 platinum cobalt units [PCUs]). As macroinvertebrate-based indices have not been shown to assess colored lakes in Florida accurately (> 20 PCUs), they have been excluded from bioassessments. A poor or very poor rating based on the average score constituted a failed bioassessment, based on the Impaired Surface Waters Rule.

Stream Condition Index

A total Stream Condition Index (SCI) score was calculated by adding the scores of the seven metrics in the method: total number of taxa; total number of taxa belonging to the orders Ephemeroptera, Plecoptera, and Trichoptera (EPT taxa); percent Chironomid taxa; percent dominant taxa; percent Diptera; percent filter feeders; and Florida Index. A poor or very poor rating based on the total score constituted a failed bioassessment, based on the Impaired Surface Waters Rule. The Basin Status Reports contain definitions and specific methods for the generation and analysis of bioassessment data.

BioRecon

To establish an impairment rating based on BioRecon data, three metrics were used: the Florida Index score, total number of taxa, and total number of EPT taxa. If all three metrics failed to meet thresholds, the water was deemed “impaired” based on the Impaired Surface Waters Rule.

Biological Integrity Standard

Quantitative data, generated through the use of Hester-Dendy artificial substrate samplers, were used to calculate Shannon-Wiener Diversity Index scores for paired background and test sites, as specified in the Biological Integrity Standard of Subsection 62-302.530(11), F.A.C. One failure of the standard meant that a waterbody segment was listed as potentially impaired.

Evaluation of Toxicity Data

Although the Impaired Surface Waters Rule describes the use of toxicity data for the assessment of aquatic life-based attainment, no ambient toxicity data are available for assessment and this metric was not used.

Primary Contact and Recreation Attainment

For Class I, II, or III waters, a waterbody was potentially impaired if the following criteria were met:

- The waterbody segment did not meet the applicable water quality criteria for bacteriological quality,
- The waterbody segment included a bathing area that was closed by a local health department or county government for more than 1 week or more than once during a calendar year based on bacteriological data,
- The waterbody segment included a bathing area for which a local health department or county government issued closures, advisories, or warnings totaling 21 days or more during a calendar year based on bacteriological data, or
- The waterbody segment included a bathing area that was closed or had advisories or warnings for more than 12 weeks during a calendar year based on previous bacteriological data or on derived relationships between bacteria levels and rainfall or flow.

Fish and Shellfish Consumption Attainment

For Class I, II, or III waters, a waterbody was potentially impaired if it did not meet the applicable Class II water quality criteria for bacteriological quality, or if a fish consumption advisory had been issued. Fish consumption advisories were based on the Florida Department of Health's "limited consumption" or "no consumption" advisories for surface waters because of high levels of mercury in fish tissue. In addition, for Class II waters, waterbody segments that had been approved for shellfish harvesting but were downgraded to a more restrictive classification were listed as potentially impaired.

Drinking Water Attainment and Protection of Human Health

For Class I waters, a waterbody was potentially impaired if it did not meet the applicable Class I water quality criteria.

Appendix E: Integrated Assessment (Master List) for the Caloosahatchee Basin

Table E.1 contains the listing status of all assessed waters in the basin as of June 30, 2004. It should be noted that subsequent to the June 2004 update of the 303(d) list, two waterbody segments,Wyoua and Whisky Creeks (WBIDs 3240R and 3240H), were combined into one WBID: Whisky Creek (WBID 3240H).

Information in this appendix was obtained from an inventory of the Legacy and modernized STORET databases, as well as data contributed directly to the Department by individual data providers. **Table E.2** includes only stations with data from the planning and verified assessment periods.

Table E.1: Integrated Water Quality Report (Master List) for the Caloosahatchee Basin, by Planning Unit

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
East Caloosahatchee Planning Unit								
3246	C-21	Stream	Aldrin	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Alkalinity	Not Impaired	2	-	-	PP - 1/431 VP - 0/287
3246	C-21	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/105 VP - 0/45
3246	C-21	Stream	Beta BHC	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Cadmium	Not Impaired	2	-	-	PP - 0/105 VP - 0/45
3246	C-21	Stream	Chlordane	Insufficient Data	3b	-	-	PP - 0/433 VP - 0/136
3246	C-21	Stream	Conductance	Not Impaired	2	-	-	PP - 25/416VP - 5/276
3246	C-21	Stream	Copper	Not Impaired	2	-	-	PP - 0/105 VP - 0/45
3246	C-21	Stream	Dementon	Insufficient Data	3b	-	-	PP - 0/26 VP - 0/16
3246	C-21	Stream	Dieldrin	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Dissolved Oxygen	Planning List	3c	Low	2011	PP - 153/413 VP - 87/276. Impaired by the IWR threshold. However, a causative pollutant has not been identified. Placed on Planning List pursuant to Subsection 62.303.300(2), F.A.C.
3246	C-21	Stream	Endosulfan	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Endrin	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Guthion	Insufficient Data	3b	-	-	PP - 0/38 VP - 0/136
3246	C-21	Stream	Heptachlor	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Nutrients (Chlorophyll a)	Planning List	3c	Low	2011	No annual average chlorophyll data available. Placed on Planning List pursuant to Subsection 62.303.300(2), F.A.C.
3246	C-21	Stream	Iron	Impaired	5	Medium	2009	PP - 83/107 VP - 21/51
3246	C-21	Stream	Lead	Not Impaired	2	-	-	PP - 0/105 VP - 0/45
3246	C-21	Stream	Lindane	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Malathion	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Mercury	Not Impaired	2	-	-	PP - 9/100 VP - 0/48

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3246	C-21	Stream	Methoxychlor	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3246	C-21	Stream	Mirex	Insufficient Data	3b	-	-	PP - 0/23 VP - 0/13
3246	C-21	Stream	pH	Not Impaired	2	-	-	PP - 7/416 VP - 5/276
3246	C-21	Stream	Toxaphene	Insufficient Data	3b	-	-	PP - 0/38 VP - 0/13
3246	C-21	Stream	Turbidity	Not Impaired	2	-	-	PP - 4/430 VP - 4/287
3246	C-21	Stream	Unionized Ammonia	Not Impaired	2	-	-	PP - 3/288 VP - 0/45
3246	C-21	Stream	Zinc	Not Impaired	2	-	-	PP - 0/105 VP - 0/45
3237A	East Caloosahatchee	Stream	Alkalinity	Not Impaired	2	-	-	PP - 2/190 VP - 1/119
3237A	East Caloosahatchee	Stream	Antimony	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3237A	East Caloosahatchee	Stream	BOD 5-Day	Planning List	3c	Low	2009	Insufficient data (BOD = 1.4, 5 observations). Placed on Planning List pursuant to Subsection 62.303.300(2), F.A.C.
3237A	East Caloosahatchee	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3237A	East Caloosahatchee	Stream	Conductance	Not Impaired	2	-	-	PP - 0/202 VP - 0/119
3237A	East Caloosahatchee	Stream	Mercury	Not Impaired	2	-	-	PP - 8/46 VP - 2/21
3237A	East Caloosahatchee	Stream	Nickel	Insufficient Data	3b	-	-	PP - 0/10 VP - 0/1
3237A	East Caloosahatchee	Stream	pH	Not Impaired	2	-	-	PP - 10/201 VP - 4/119
3237A	East Caloosahatchee	Stream	Selenium	Insufficient Data	3b	-	-	PP - 0/10 VP - 0/1
3237A	East Caloosahatchee	Stream	Thallium	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3237A	East Caloosahatchee	Stream	Turbidity	Not Impaired	2	-	-	PP - 3/203 VP - 3/120
3237A	East Caloosahatchee	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3237A	East Caloosahatchee	Stream	Beryllium	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3237A	East Caloosahatchee	Stream	Dissolved Oxygen	Planning List	3c	Low	2009	PP - 158/195 VP - 92/118. Potentially Impaired by the IWR standards. TN is above the screening level at 1.68 mg/L; however, chlorophyll *a* data do not indicate nutrient impairment. Further testing is necessary to determine if low DO levels are naturally occurring.
3237A	East Caloosahatchee	Stream	Zinc	Not Impaired	2	-	-	PP - 0/54 VP - 0/24
3237A	East Caloosahatchee	Stream	Lead	Not Impaired	2	-	-	PP - 1/52 VP - 1/23
3237A	East Caloosahatchee	Stream	Iron	Impaired	5	Medium	2009	PP - 69/106 VP - 23/60
3237A	East Caloosahatchee	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 2/36 VP - 1/22
3237A	East Caloosahatchee	Stream	Copper	Not Impaired	2	-	-	PP - 1/55 VP - 1/24
3237A	East Caloosahatchee	Stream	Total Coliform	Not Impaired	2	-	-	PP - 0/27 VP - 0/22
3237A	East Caloosahatchee	Stream	Unionized Ammonia	Not Impaired	2	-	-	PP - 0/123 VP - 0/37
3237A	East Caloosahatchee	Stream	Nutrients (Chlorophyll a)	Planning List	3c	Low	2009	Annual average chlorophyll of 19.24 μg/L in 1999 is elevated but below the IWR threshold level of 20.0 μg/L. TN at 1.68 mg/L exceeds the screening criteria, and the system is co-limited for TN and TP. Further testing is necessary to determine if nutrients are causing impairment.
3237A	East Caloosahatchee	Stream	Cadmium	Not Impaired	2	-	-	PP - 2/52 VP - 1/23

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3237A	East Caloosahatchee	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/74 VP - 0/29
3237A	East Caloosahatchee	Stream	Multiple Pesticides			-	-	Atrazine, atrazine desethyl, bromacil, diazinon, ethoprop, noroflurazon, and simazine are being further evaluated by the Department for acute and chronic toxicity. The sources of data for this evaluation are the Pesticide Surface Water Reports by the South Florida Water Management District (SFWMD).
3237B	Long Hammock Creek	Stream	Alkalinity	Not Impaired	2	-	-	PP - 0/16 VP - 0/21
3237B	Long Hammock Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 0/17 VP - 0/24
3237B	Long Hammock Creek	Stream	Lead	Planning List	3c	-	-	PP - 4/8 VP -8/16
3237B	Long Hammock Creek	Stream	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll of 38.68 μg/L in 2000 and 40.08 μg/L in 2002 are above the IWR threshold level of 20.0 μg/L. Verified by the IWR standards. No data for TN or TP, and assumed to be co-limiting.
3237B	Long Hammock Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/16 VP - 0/23
3237B	Long Hammock Creek	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/18 VP - 0/21
3237B	Long Hammock Creek	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/8 VP - 0/16

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3237B	Long Hammock Creek	Stream	Iron	Insufficient Data	3b	-	-	PP - 1/6 VP - 1/6
3237B	Long Hammock Creek	Stream	Malathion	Insufficient Data	3b	-	-	PP - 4/4 VP - 6/6
3237B	Long Hammock Creek	Stream	Dissolved Oxygen	Impaired	5	Medium	2009	PP - 4/17 VP - 6/24, verified by the IWR thresholds. No data for TN, TP, or BOD, but nutrients were identified as a causative pollutant based on nutrient impairment (elevated chlorophyll values).
3237B	Long Hammock Creek	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 0/14 VP - 0/19
3237B	Long Hammock Creek	Stream	Total Coliform	Not Impaired	2	-	-	PP - 1/12 VP - 1/16
3237B	Long Hammock Creek	Stream	Arsenic	Insufficient Data	3b	-	-	PP - 0/4 VP - 0/12
3237B	Long Hammock Creek	Stream	Copper	Insufficient Data	3b	-	-	PP - 0/8 VP - 2/16
3237B	Long Hammock Creek	Stream	Zinc	Insufficient Data	3b	-	-	PP - 0/8 VP - 0/16
3237B	Long Hammock Creek	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/2 VP - No Data
3237B	Long Hammock Creek	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/2 VP - No Data
3237C	Lake Hicpochee	Lake	Alkalinity	Not Impaired	2	-	-	PP - 0/24 VP - 0/60
3237C	Lake Hicpochee	Lake	Conductance	Not Impaired	2	-	-	PP - 0/28 VP - 0/76
3237C	Lake Hicpochee	Lake	Chromium III	Not Impaired	2	-	-	PP - 0/24 VP - 0/56
3237C	Lake Hicpochee	Lake	Dissolved Oxygen	Planning List	3c	-	-	PP - 1/28 VP - 28/76. Impaired by the IWR thresholds; however, a causative pollutant has not been identified. No TN, TP, BOD, or TSI data available.

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3237C	Lake Hicpochee	Lake	Nutrients (Chlorophyll a)	No Data	3c	High	2004	PP - No Data VP - No Data. Placed on Planning List pursuant to Subsection 62.303.300(2), F.A.C.
3237C	Lake Hicpochee	Lake	Lead	Impaired	5	Medium	2009	PP - 20/24 VP - 40/56
3237C	Lake Hicpochee	Lake	Arsenic	Not Impaired	2	-	-	PP - 0/24 VP - 0/56
3237C	Lake Hicpochee	Lake	Copper	Not Impaired	2	-	-	PP - 0/24 VP - 6/56
3237C	Lake Hicpochee	Lake	Fecal Coliform	Not Impaired	2	-	-	PP - 0/28 VP - 3/58
3237C	Lake Hicpochee	Lake	Total Coliform	Impaired	5	Medium	2009	PP - 9/28 VP - 12/51
3237C	Lake Hicpochee	Lake	Malathion	Insufficient Data	3b	-	-	PP - No Data VP - 4/4
3237C	Lake Hicpochee	Lake	pH	Not Impaired	2	-	-	PP - 0/28 VP - 0/76
3237C	Lake Hicpochee	Lake	Turbidity	Not Impaired	2	-	-	PP - 0/24 VP - 0/56
3237C	Lake Hicpochee	Lake	Zinc	Not Impaired	2	-	-	PP - 0/24 VP - 0/56
3237D	Ninemile Canal	Stream	Alkalinity	Not Impaired	2	-	-	PP - 0/34 VP - 0/50
3237D	Ninemile Canal	Stream	Conductance	Not Impaired	2	-	-	PP - 0/31 VP - 2/53
3237D	Ninemile Canal	Stream	pH	Not Impaired	2	-	-	PP - 1/31 VP - 1/53
3237D	Ninemile Canal	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/32 VP - 0/28
3237D	Ninemile Canal	Stream	Iron	Not Impaired	2	-	-	PP - 0/22 VP - 0/22
3237D	Ninemile Canal	Stream	BOD 5-Day	No Data	3c	High	2004	No data available for the verified period. Placed on Planning List pursuant to Subsection 62.303.300(2), F.A.C.
3237D	Ninemile Canal	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/6 VP - 0/22
3237D	Ninemile Canal	Stream	Copper	Not Impaired	2	-	-	PP - 0/12 VP - 1/28
3237D	Ninemile Canal	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 10.05 µg/L in 1999 and 14.66 µg/L in 2002 is below the IWR threshold level of 20.0 µg/L. Placed on Delist List.
3237D	Ninemile Canal	Stream	Malathion	Insufficient Data	3b	-	-	PP - 4/4 VP - 7/7
3237D	Ninemile Canal	Stream	Fecal Coliform	Impaired	5	High	2004	PP - 4/34 VP - 9/49
3237D	Ninemile Canal	Stream	Lead	Impaired	5	Medium	2009	PP - 6/12 VP - 14/28

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3237D	Ninemile Canal	Stream	Zinc	Not Impaired	2	-	-	PP - 0/12 VP - 0/28
3237D	Ninemile Canal	Stream	Total Coliform	Not Impaired	2	-	-	PP - 5/32 VP - 5/41
3237D	Ninemile Canal	Stream	Dissolved Oxygen	Planning List	3c	High	2004	PP - 29/30 VP - 49/52. Impaired based on the IWR thresholds. However, nutrients are not the cause of impairment based on chlorophyll data, and a causative pollutant has not been identified. Further testing is necessary to determine if low DO levels are naturally occurring.
3237D	Ninemile Canal	Stream	Chromium III	Not Impaired	2	-	-	PP - 0/12 VP - 0/28
West Caloosahatchee Planning Unit								
3235A	West Caloosahatchee	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/79 VP - 0/81
3235A	West Caloosahatchee	Stream	24D	Insufficient Data	3b	-	-	PP - 0/43 VP - 0/18
3235A	West Caloosahatchee	Stream	Aldrin	Insufficient Data	3b	-	-	PP - 0/42VP - 0/17
3235A	West Caloosahatchee	Stream	Alkalinity	Not Impaired	2	-	-	PP - 0/131 VP - 0/80
3235A	West Caloosahatchee	Stream	Beryllium	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3235A	West Caloosahatchee	Stream	Beta BHC	Insufficient Data	3b	-	-	PP -0/42 VP - 0/17
3235A	West Caloosahatchee	Stream	Chlordane	Insufficient Data	3b	-	-	PP - 3/170 VP - 0/14
3235A	West Caloosahatchee	Stream	Conductance	Not Impaired	2	-	-	PP - 5/255 VP - 5/199
3235A	West Caloosahatchee	Stream	Dementon	Insufficient Data	3b	-	-	PP - 0/27 VP - 0/17
3235A	West Caloosahatchee	Stream	Dieldrin	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3235A	West Caloosahatchee	Stream	Dissolved Solids	Not Impaired	2	-	-	PP - 1/20 VP - 1/20
3235A	West Caloosahatchee	Stream	Endosulfan	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235A	West Caloosahatchee	Stream	Endrin	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235A	West Caloosahatchee	Stream	Guthion	Insufficient Data	3b	-	-	PP - 0/39 VP - 0/14
3235A	West Caloosahatchee	Stream	Heptachlor	Insufficient Data	3b	-	-	PP - 0/42VP - 0/17
3235A	West Caloosahatchee	Stream	Lindane	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235A	West Caloosahatchee	Stream	Mercury	Planning List	3c	-	-	PP - 4/18 ; VP - 2/11
3235A	West Caloosahatchee	Stream	Methoxychlor	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235A	West Caloosahatchee	Stream	Mirex	Insufficient Data	3b	-	-	PP - 0/24 VP - 0/14

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235A	West Caloosahatchee	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll *a* for 1999 (84.59 μg/L) was above listing threshold of 20 μg/L, but followed by 4 consecutive years below the threshold (annual means of 3.98 μg/L in 2000, 8.22 μg/L in 2001, 6.16 μg/L in 2002, and 1.42 μg/L in 2003).
3235A	West Caloosahatchee	Stream	Dissolved Oxygen	Impaired, but a TMDL is not required	4c	-	-	PP - 115/207 VP - 116/199. Impaired based on IWR thresholds. However nutrients are not causing impairment and TN, TP, and BOD do not exceed the 70th percentile screening level values (TN = 1.382 [268 observations], TP = 0.103 [204 observations], and BOD = 1.6 [87 observations]). Data indicate that low DO levels are a natural condition.
3235A	West Caloosahatchee	Stream	Iron	Impaired	5	Medium	2009	PP - 49/76; VP - 25/50
3235A	West Caloosahatchee	Stream	Chromium III	Not Impaired	2	-	-	PP - 0/2 VP - 0/20
3235A	West Caloosahatchee	Stream	Cadmium	Insufficient Data	3b	-	-	PP - 0/21 VP - 0/11
3235A	West Caloosahatchee	Stream	Chloride	Not Impaired	2	-	-	PP - 3/170 VP - 2/156
3235A	West Caloosahatchee	Stream	Copper	Not Impaired	2	-	-	PP - 0/95 VP - 6/105
3235A	West Caloosahatchee	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 4/119 VP - 2/124

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235A	West Caloosahatchee	Stream	Nitrate	Not Impaired	2	-	-	PP - 0/143 VP - 0/128
3235A	West Caloosahatchee	Stream	Lead	Impaired	5	Medium	2009	PP - 1/29 VP - 11/45
3235A	West Caloosahatchee	Stream	pH	Not Impaired	2	-	-	PP - 7/251 VP - 2/202
3235A	West Caloosahatchee	Stream	Silvex	Insufficient Data	3b	-	-	PP - 0/43 VP - 0/18
3235A	West Caloosahatchee	Stream	Total Coliform	Not Impaired	2	-	-	PP - 0/39 VP - 0/43
3235A	West Caloosahatchee	Stream	Toxaphene	Insufficient Data	3b	-	-	PP - 0/39 VP - 0/14
3235A	West Caloosahatchee	Stream	Turbidity	Not Impaired	2	-	-	PP - 1/246 VP - 1/189
3235A	West Caloosahatchee	Stream	Zinc	Not Impaired	2	-	-	PP - 0/90 VP - 0/100
3235A	West Caloosahatchee	Stream	Unionized Ammonia	Not Impaired	2	-	-	PP - 0/55 VP - 0/19
3235A	West Caloosahatchee	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/5 VP - 0/3
3235A	West Caloosahatchee	Stream	Malathion	Impaired	3b	Medium	2009	PP - 2/44 VP - 6/23
3235A	West Caloosahatchee	Stream	Multiple Pesticides			-	-	Atrazine, atrazine desethyl, diazinon, ethoprop, bromacil, noroflurazon, and smazine are being further evaluated by the Department for acute and chronic toxicity. The sources of data for this evaluation are the Pesticide Surface Water Reports by the SFWMD.
3235B	West Caloosahatchee	Stream	Alkalinity	Not Impaired	2	-	-	PP - 0/48 VP - 0/20
3235B	West Caloosahatchee	Stream	Conductance	Not Impaired	2	-	-	PP - 0/60 VP - 0/40
3235B	West Caloosahatchee	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 0/12 VP - 0/34
3235B	West Caloosahatchee	Stream	Copper	Insufficient Data	3b	-	-	PP - No Data VP - 5/18
3235B	West Caloosahatchee	Stream	Lead	Insufficient Data	3b	-	-	PP - No Data VP - 10/18

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235B	West Caloosahatchee	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average mean chlorophyll values of 13.05 μg/L for 2002 and 9.98 μg/L in 2003 are below the IWR threshold level of 20.0 μg/L.
3235B	West Caloosahatchee	Stream	Malathion	Insufficient Data	3b	-	-	PP - No Data VP - 4/4
3235B	West Caloosahatchee	Stream	pH	Not Impaired	2	-	-	PP - 3/60 VP - 0/42
3235B	West Caloosahatchee	Stream	Total Coliform	Not Impaired	2	-	-	PP - 0/10 VP - 0/25
3235B	West Caloosahatchee	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/54 VP - 1/32
3235B	West Caloosahatchee	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - 8/12 VP - 19/40. Impaired based on the IWR thresholds; however, a causative pollutant has not been identified. No data are available for BOD, TN, and TP, but available chlorophyll data indicate the WBID is not impaired for nutrients. Further testing is necessary to determine if low dissolved oxygen levels are naturally occurring.
3235B	West Caloosahatchee	Stream	Zinc	Insufficient Data	3b	-	-	PP - No Data VP - 0/18
3235B	West Caloosahatchee	Stream	Arsenic	Insufficient Data	3b	-	-	PP - No Data VP - 0/18
3235B	West Caloosahatchee	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/18

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235B	West Caloosahatchee	Stream	Multiple Pesticides			-	-	Atrazine, atrazine desethyl, diazinon, ethoprop, bromacil, noroflurazon, and simazine are being further evaluated by the Department for acute and chronic toxicity. The sources of data for this evaluation are the Pesticide Surface Water Reports by the SFWMD.
3235C	Cypress Creek	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - 0/14 VP - 0/12
3235C	Cypress Creek	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/2
3235C	Cypress Creek	Stream	Conductance	Insufficient Data	3b	-	-	PP - 0/15 VP - 0/13
3235C	Cypress Creek	Stream	Copper	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/2
3235C	Cypress Creek	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/3 VP - 0/1
3235C	Cypress Creek	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - 14/15 VP - 12/13 Impaired based on the IWR thresholds; however, a causative pollutant has not been identified. No data available for BOD, TN, and TP. Further testing is necessary to determine if low DO levels are naturally occurring.
3235C	Cypress Creek	Stream	Total Coliform	Insufficient Data	3b	-	-	PP - 1/10 VP - 1/10
3235C	Cypress Creek	Stream	Fecal Coliform	Planning List	3c	-	-	PP - 5/13 VP - 5/12
3235C	Cypress Creek	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3235C	Cypress Creek	Stream	Iron	Insufficient Data	3b	-	-	PP - 0/13 VP - 0/13
3235C	Cypress Creek	Stream	Lead	Insufficient Data	3b	-	-	PP - 2/2 VP - 0/2
3235C	Cypress Creek	Stream	Malathion	Insufficient Data	3b	-	-	PP - 2/2 VP - 2/2

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235C	Cypress Creek	Stream	Mercury	Insufficient Data	3b	-	-	PP - 2/2 VP - 2/2 Need to verify if samples were collected with clean techniques.
3235C	Cypress Creek	Stream	pH	Insufficient Data	3b	-	-	PP - 1/15 VP - 1/13
3235C	Cypress Creek	Stream	Turbidity	Insufficient Data	3b	-	-	PP - 0/15 VP - 0/13
3235C	Cypress Creek	Stream	Zinc	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/2
3235D	Jacks Branch	Stream	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll values exceeded thresholds in 1999 (28.63 μg/L) and 2000 (29.87 μg/L). No data available for TN and TP, so the limiting nutrient has not been identified, and the water is assumed to be co-limited.
3235D	Jacks Branch	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - 7/19 VP - 7/29. Impaired based on the IWR thresholds; however, a causative pollutant has not been identified. No data available for BOD, TN, and TP.
3235D	Jacks Branch	Stream	Alkalinity	Not Impaired	2	-	-	PP - 0/17 VP - 0/24
3235D	Jacks Branch	Stream	Arsenic	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/10
3235D	Jacks Branch	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/7 VP - 0/15
3235D	Jacks Branch	Stream	Conductance	Not Impaired	2	-	-	PP - 1/20 VP - 1/30
3235D	Jacks Branch	Stream	Copper	Insufficient Data	3b	-	-	PP - 0/7 VP - 4/15
3235D	Jacks Branch	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/2
3235D	Jacks Branch	Stream	Iron	Insufficient Data	3b	-	-	PP - 0/13 VP - 0/13
3235D	Jacks Branch	Stream	Zinc	Insufficient Data	3b	-	-	PP - 0/7 VP - 0/15
3235D	Jacks Branch	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 2/18 VP - 4/24
3235D	Jacks Branch	Stream	Lead	Planning List	3c	-	-	PP - 4/7 VP - 8/15
3235D	Jacks Branch	Stream	Malathion	Insufficient Data	3b	-	-	PP - 4/4 VP - 6/6

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235D	Jacks Branch	Stream	Mercury	Insufficient Data	3b	-	-	PP - 2/2 VP - 2/2 Need to verify if samples were collected with clean techniques.
3235D	Jacks Branch	Stream	pH	Not Impaired	2	-	-	PP - 0/20 VP - 0/30
3235D	Jacks Branch	Stream	Total Coliform	Not Impaired	2	-	-	PP - 2/17 VP - 4/21
3235D	Jacks Branch	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/19 VP - 0/24
3235D	Jacks Branch	Stream	Un-ionized Ammonia	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3235E	Bee Branch	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - No Data VP - 4/17
3235E	Bee Branch	Stream	Arsenic	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235E	Bee Branch	Stream	Chromium III	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235E	Bee Branch	Stream	Conductance	Not Impaired	2	-	-	PP - No Data VP - 0/20
3235E	Bee Branch	Stream	Copper	Planning List	3c	-	-	PP - No Data VP - 14/17
3235E	Bee Branch	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - No Data VP - 14/20. Impaired based on the IWR thresholds; however, a causative pollutant has not been identified. No data available for BOD, TN, and TP.
3235E	Bee Branch	Stream	Fecal Coliform	Planning List	3c	-	-	PP - No Data VP - 6/15
3235E	Bee Branch	Stream	Lead	Planning List	3c	-	-	PP - No Data VP - 12/17
3235E	Bee Branch	Stream	pH	Not Impaired	2	-	-	PP - No Data VP - 3/20
3235E	Bee Branch	Stream	Malathion	Insufficient Data	3b	-	-	PP - No Data VP - 4/4
3235E	Bee Branch	Stream	Turbidity	Not Impaired	2	-	-	PP - No Data VP - 1/20

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235E	Bee Branch	Stream	Zinc	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235F	Pollywog Creek	Stream	Lead	Planning List	3c	-	-	PP - 3/3 VP - 3/3 Placed on Planning List because there were 3 exceedances with fewer than 10 samples.
3235F	Pollywog Creek	Stream	Alkalinity	Planning List	3c	-	-	PP - 4/15 VP - 2/13
3235F	Pollywog Creek	Stream	Conductance	Insufficient Data	3b	-	-	PP - 0/14 VP - 0/12
3235F	Pollywog Creek	Stream	pH	Insufficient Data	3b	-	-	PP - 1/14 VP - 0/12
3235F	Pollywog Creek	Stream	Turbidity	Insufficient Data	3b	-	-	PP - 0/12 VP - 0/10
3235F	Pollywog Creek	Stream	Total Coliform	Planning List	3c	-	-	PP - 4/11 VP - 4/11
3235F	Pollywog Creek	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 3.44 μg/L for 1999 is below the IWR threshold level of 20.0 μg/L.
3235F	Pollywog Creek	Stream	Zinc	Insufficient Data	3b	-	-	PP - 0/3 VP - 0/3
3235F	Pollywog Creek	Stream	Copper	Insufficient Data	3b	-	-	PP - 0/3 VP - 0/3
3235F	Pollywog Creek	Stream	Malathion	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1
3235F	Pollywog Creek	Stream	Arsenic	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/2
3235F	Pollywog Creek	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/3 VP - 0/3
3235F	Pollywog Creek	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - 7/14 VP - 7/12. Impaired based on the IWR thresholds; however, a causative pollutant has not been identified. No data available for BOD, TN, and TP.
3235F	Pollywog Creek	Stream	Fecal Coliform	Planning List	3c	-	-	PP - 10/14 VP - 9/13
3235F	Pollywog Creek	Stream	Iron	Planning List	3c	-	-	PP - 8/10 VP - 8/10
3235F	Pollywog Creek	Stream	Mercury	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1 Need to verify if samples were collected with clean techniques.
3235G	Cypress Branch	Stream	Fecal Coliform	Insufficient Data	3b	-	-	PP - 4/9 VP - 4/9

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235G	Cypress Branch	Stream	Biology	Not Impaired	2	-	-	BioRecon assessment ratings of "healthy" in 1997 and 1999. SCI assessment ratings of "excellent" in 1997 and 1999.
3235G	Cypress Branch	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - 4/11 VP - 4/11
3235G	Cypress Branch	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - 4/8 VP - 4/8
3235G	Cypress Branch	Stream	Conductance	Insufficient Data	3b	-	-	PP - 0/11 VP - 0/11
3235G	Cypress Branch	Stream	pH	Insufficient Data	3b	-	-	PP - 0/11 VP - 0/11
3235G	Cypress Branch	Stream	Turbidity	Insufficient Data	3b	-	-	PP - 0/9 VP - 0/1
3235G	Cypress Branch	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/2
3235G	Cypress Branch	Stream	Total Coliform	Insufficient Data	3b	-	-	PP - 2/7 VP - 2/7
3235G	Cypress Branch	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3235G	Cypress Branch	Stream	Iron	Planning List	3c	-	-	PP - 6/10 VP - 6/10
3235H	Hickey Creek	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 4.59 µg/L in 2000, 5.09 µg/L in 2001, and 2.75 µg/L in 2002 are below the IWR threshold level of 20.0 µg/L.
3235H	Hickey Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 0/117 VP - 0/70
3235H	Hickey Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/117 VP - 0/70
3235H	Hickey Creek	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/117 VP - 0/70
3235H	Hickey Creek	Stream	Copper	Not Impaired	2	-	-	PP - 0/94 VP - 0/70
3235H	Hickey Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/117 VP - 0/70
3235H	Hickey Creek	Stream	Lead	Not Impaired	2	-	-	PP - 0/14 VP - 0/11
3235H	Hickey Creek	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/1 VP - No Data
3235H	Hickey Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/37 VP - 0/46
3235H	Hickey Creek	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 1/70 VP - 2/70

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235H	Hickey Creek	Stream	Dissolved Oxygen	Impaired, but a TMDL is not required	4c	-	-	PP - 84/117 VP - 51/70 Impaired based on the IWR thresholds. However, nutrients are not causing impairment and TN, TP, and BOD do not exceed the 70th percentile screening level values (TN = 0.42 [70 observations], TP = 0.05 [70 observations], and BOD = 1.5 [70 observations]). Data indicate that low DO levels are a natural condition.
3235I	Bedman Creek	Stream	Lead	Not Impaired	2	-	-	PP - 0/10 VP - 1/10
3235I	Bedman Creek	Stream	Biology	Not Impaired	2	-	-	BioRecon assessment rating of "healthy" in 2002. SCI assessment ratings of "good" in 1996 and "excellent" in 1999.
3235I	Bedman Creek	Stream	Dissolved Oxygen	Not Impaired	2	-	-	PP - 83/120 VP - 55/71. While DO does not meet the applicable DO criterion, available bioassessment data indicate the WBID meets aquatic life use support. Data indicate that low DO levels are a natural condition.
3235I	Bedman Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/37 VP - 0/47
3235I	Bedman Creek	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 8/71 VP - 5/70

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235I	Bedman Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 0/120 VP - 0/71
3235I	Bedman Creek	Stream	Fluoride	Insufficient Data	3b	-	-	PP - No Data VP - 0/1
3235I	Bedman Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/120 VP - 0/71
3235I	Bedman Creek	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/120 VP - 0/71
3235I	Bedman Creek	Stream	Copper	Not Impaired	2	-	-	PP - 0/93 VP - 0/71
3235I	Bedman Creek	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3235I	Bedman Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/117 VP - 0/71
3235I	Bedman Creek	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 1.77 µg/L in 2000, 2.14 µg/L in 2001, and 1.65 µg/L in 2002 is below the IWR threshold level of 20 µg/L.
3235J	Dog Canal	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235J	Dog Canal	Stream	Arsenic	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235J	Dog Canal	Stream	Chromium III	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235J	Dog Canal	Stream	Conductance	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235J	Dog Canal	Stream	Copper	Planning List	3c	-	-	PP - No Data VP - 7/17
3235J	Dog Canal	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - No Data VP - 4/17
3235J	Dog Canal	Stream	Fecal Coliform	Insufficient Data	3b	-	-	PP - No Data VP - 0/14
3235J	Dog Canal	Stream	Lead	Planning List	3c	-	-	PP - No Data VP - 14/17
3235J	Dog Canal	Stream	Malathion	Insufficient Data	3b	-	-	PP - No Data VP - 4/4
3235J	Dog Canal	Stream	pH	Insufficient Data	3b	-	-	PP - No Data VP - 0/17
3235J	Dog Canal	Stream	Total Coliform	Insufficient Data	3b	-	-	PP - No Data VP - 0/4
3235J	Dog Canal	Stream	Turbidity	Insufficient Data	3b	-	-	PP - No Data VP - 1/17
3235J	Dog Canal	Stream	Zinc	Insufficient Data	3b	-	-	PP - No Data VP - 1/17
3235K	Townsend Canal	Stream	Aldrin	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235K	Townsend Canal	Stream	Alkalinity	Not Impaired	2	-	-	PP - 0/18 VP - 0/32
3235K	Townsend Canal	Stream	Antimony	Insufficient Data	3b	-	-	PP - No Data VP - 0/5
3235K	Townsend Canal	Stream	Beryllium	Insufficient Data	3b	-	-	PP - No Data VP - 3/5
3235K	Townsend Canal	Stream	Beta BHC	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235K	Townsend Canal	Stream	Cadmium	Insufficient Data	3b	-	-	PP - No Data VP - 0/5
3235K	Townsend Canal	Stream	Chlordane	Insufficient Data	3b	-	-	PP - 0/39 VP - 0/14
3235K	Townsend Canal	Stream	Conductance	Not Impaired	2	-	-	PP - 0/26 VP - 0/48
3235K	Townsend Canal	Stream	Demeton	Insufficient Data	3b	-	-	PP - 0/27 VP - 0/17
3235K	Townsend Canal	Stream	Dieldrin	Insufficient Data	3b	-	-	PP - 0/41 VP - 0/16
3235K	Townsend Canal	Stream	Endosulfan	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235K	Townsend Canal	Stream	Endrin	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235K	Townsend Canal	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 3/25 VP - 5/44
3235K	Townsend Canal	Stream	Guthion	Insufficient Data	3b	-	-	PP - 0/39 VP - 0/14
3235K	Townsend Canal	Stream	Heptachlor	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235K	Townsend Canal	Stream	Total Coliform	Not Impaired	2	-	-	PP - 1/22 VP - 1/36
3235K	Townsend Canal	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 2.65 μg/L in 1999, 3.03 μg/L in 2000, 3.19 μg/L in 2001, 7.12 μg/L in 2002, and 4.45 μg/L in 2003 is below the IWR threshold level of 20.0 μg/L.
3235K	Townsend Canal	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/1 VP - No Data
3235K	Townsend Canal	Stream	Iron	Not Impaired	2	-	-	PP - 0/12 VP - 0/17
3235K	Townsend Canal	Stream	Chromium III	Not Impaired	2	-	-	PP - 0/6 VP - 0/28
3235K	Townsend Canal	Stream	Lindane	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235K	Townsend Canal	Stream	Malathion	Impaired	3b	Medium	2009	PP - 2/44 VP - 7/24
3235K	Townsend Canal	Stream	Methoxychlor	Insufficient Data	3b	-	-	PP - 0/42 VP - 0/17
3235K	Townsend Canal	Stream	Mirex	Insufficient Data	3b	-	-	PP - 0/24 VP - 0/14
3235K	Townsend Canal	Stream	Nickel	Insufficient Data	3b	-	-	PP - No Data VP - 0/5
3235K	Townsend Canal	Stream	pH	Not Impaired	2	-	-	PP - 0/26 VP - 0/49
3235K	Townsend Canal	Stream	Selenium	Insufficient Data	3b	-	-	PP - No Data VP - 3/5
3235K	Townsend Canal	Stream	Silver	Insufficient Data	3b	-	-	PP - No Data VP - 0/5
3235K	Townsend Canal	Stream	Thallium	Insufficient Data	3b	-	-	PP - No Data VP - 0/5
3235K	Townsend Canal	Stream	Toxaphene	Insufficient Data	3b	-	-	PP - 0/39 VP - 0/14
3235K	Townsend Canal	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/26 VP - 0/38

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235K	Townsend Canal	Stream	Zinc	Not Impaired	2	-	-	PP - 0/6 VP - 0/28
3235K	Townsend Canal	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/2 VP - No Data
3235K	Townsend Canal	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/3 VP - 0/25
3235K	Townsend Canal	Stream	Copper	Impaired	5	Medium	2009	PP - 0/6 VP - 6/27
3235K	Townsend Canal	Stream	Mercury	Insufficient Data	3b	-	-	PP - 1/1 VP - 4/6
3235K	Townsend Canal	Stream	Lead	Impaired	5	Medium	2009	PP - 4/6 VP - 13/28
3235K	Townsend Canal	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - 7/25 VP - 15/47, Potentially impaired based on the IWR standards. No data for TN, TP, or BOD. Further testing is necessary to determine if low DO levels are naturally occurring.
3235K	Townsend Canal	Stream	Multiple Pesticides			-	-	Atrazine, atrazine desethyl, bromacil, diazinon, ethoprop, noroflurazon, and simazine are being further evaluated by the Department for acute and chronic toxicity. The sources of data for this evaluation are the Pesticide Surface Water Reports by the SFWMD.
3235L	Townsend Canal	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - No Data VP - 0/18
3235L	Townsend Canal	Stream	Arsenic	Insufficient Data	3b	-	-	PP - No Data VP - 0/18
3235L	Townsend Canal	Stream	Conductance	Insufficient Data	3b	-	-	PP - No Data VP - 1/18
3235L	Townsend Canal	Stream	Nutrients (Chlorophyll a)	No Data	3a	-	-	PP - No Data VP - No Data

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235L	Townsend Canal	Stream	Chromium III	Insufficient Data	3b	-	-	PP - No Data VP - 0/18
3235L	Townsend Canal	Stream	Copper	Planning List	3c	-	-	PP - No Data VP - 13/18
3235L	Townsend Canal	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - No Data VP - 15/18 No data for TN, TP, or BOD.
3235L	Townsend Canal	Stream	Fecal Coliform	Insufficient Data	3b	-	-	PP - No Data VP - 0/11
3235L	Townsend Canal	Stream	Lead	Planning List	3c	-	-	PP - No Data VP - 14/18
3235L	Townsend Canal	Stream	Malathion	Insufficient Data	3b	-	-	PP - No Data VP - 3/3
3235L	Townsend Canal	Stream	pH	Insufficient Data	3b	-	-	PP - No Data VP - 0/18
3235L	Townsend Canal	Stream	Turbidity	Insufficient Data	3b	-	-	PP - No Data VP - 0/18
3235L	Townsend Canal	Stream	Zinc	Insufficient Data	3b	-	-	PP - No Data VP - 1/17
3235M	Goodno Canal	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - 0/12 VP - 0/11
3235M	Goodno Canal	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/1VP - 0/1
3235M	Goodno Canal	Stream	Conductance	Insufficient Data	3b	-	-	PP - 0/16 VP - 0/12
3235M	Goodno Canal	Stream	Copper	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3235M	Goodno Canal	Stream	pH	Insufficient Data	3b	-	-	PP - 0/15 VP - 0/11
3235M	Goodno Canal	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 3.00 μg/L in 1999 is below the IWR threshold level of 20 μg/L.
3235M	Goodno Canal	Stream	Fecal Coliform	Planning List	3c	-	-	PP - 3/12 VP - 2/10
3235M	Goodno Canal	Stream	Iron	Planning List	3c	-	-	PP - 7/12 VP - 7/12
3235M	Goodno Canal	Stream	Lead	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1
3235M	Goodno Canal	Stream	Malathion	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1
3235M	Goodno Canal	Stream	Mercury	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1
3235M	Goodno Canal	Stream	Dissolved Oxygen	Planning List	3c	-	-	PP - 9/16 VP - 9/12 No data for TN, TP, or BOD.
3235M	Goodno Canal	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/3 VP - 0/1
3235M	Goodno Canal	Stream	Total Coliform	Insufficient Data	3b	-	-	PP - 0/9 VP - 0/9
3235M	Goodno Canal	Stream	Turbidity	Insufficient Data	3b	-	-	PP - 1/16 VP - 1/12

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3235M	Goodno Canal	Stream	Zinc	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3235M	Goodno Canal	Stream	Biology	Not Impaired	2	-	-	BioRecon assessment rating of "suspect" in 1999, but SCI assessment rating of "good" in 1999.
3235N	Roberts Canal	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - 0/12 VP - 0/12
3235N	Roberts Canal	Stream	Conductance	Insufficient Data	3b	-	-	PP - 0/10 VP - 0/10
3235N	Roberts Canal	Stream	pH	Insufficient Data	3b	-	-	PP - 1/9 VP - 1/9
3235N	Roberts Canal	Stream	Turbidity	Insufficient Data	3b	-	-	PP - 0/11 VP - 0/11
3235N	Roberts Canal	Stream	Iron	Not Impaired	2	-	-	PP - 1/11 VP - 1/11
3235N	Roberts Canal	Stream	Malathion	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1
3235N	Roberts Canal	Stream	Mercury	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1
3235N	Roberts Canal	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 2/12 VP - 2/12
3235N	Roberts Canal	Stream	Dissolved Oxygen	Insufficient Data	3b	-	-	PP - 2/9 VP - 2/9
3235N	Roberts Canal	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 3.08 μg/L in 1999 is below the IWR threshold level of 20.0 μg/L.
3235N	Roberts Canal	Stream	Total Coliform	Not Impaired	2	-	-	PP - 0/12 VP - 0/12
Telegraph Swamp Planning Unit								
3236	Telegraph Swamp	Stream	N/A	No Data	3a	-	-	PP - No Data VP - No Data

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3236A	Telegraph Creek	Stream	Dissolved Oxygen	Not Impaired	2	-	-	PP - 95/134 VP - 60/77. DO values do not meet applicable DO criterion, but bioassessment data indicate the WBID meets aquatic life use support. Nutrients are not a cause of impairment, and TN, TP, and BOD do not exceed the 70th percentile screening level values. Data indicate that low DO levels are a natural condition.
3236A	Telegraph Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 30/134 VP - 24/76 This segment is tidally influenced, and the periodic low conductivity values are believed to be due to natural conditions.
3236A	Telegraph Creek	Stream	Iron	Insufficient Data	3b	-	-	PP - No Data VP - 0/1
3236A	Telegraph Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/133 VP - 0/77
3236A	Telegraph Creek	Stream	Turbidity	Insufficient Data	3b	-	-	PP - 0/135 VP - 0/77
3236A	Telegraph Creek	Stream	Unionized Ammonia	Not Impaired	2	-	-	PP - 0/15 VP - 0/5
3236A	Telegraph Creek	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll means of 6.33 μg/L in 2000, 1.59 μg/L in 2001, and 1.75 μg/L in 2002 are below the IWR threshold level of 20.0 μg/L.

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3236A	Telegraph Creek	Stream	Biology	Not Impaired	2	-	-	BioRecon assessment rating of "healthy" in 1999, and SCI assessment ratings of "excellent" in 2002.
3236A	Telegraph Creek	Stream	Copper	Not Impaired	2	-	-	PP - 0/95 VP - 1/71
3236A	Telegraph Creek	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 8/81 VP - 8/73
3236A	Telegraph Creek	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/4 VP - 0/4
3236A	Telegraph Creek	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3236A	Telegraph Creek	Stream	Cadmium	Insufficient Data	3b	-	-	PP - 1/1 VP - No Data
3236A	Telegraph Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/37 VP- 0/47
3236A	Telegraph Creek	Stream	Lead	Not Impaired	2	-	-	PP - 0/14 VP - 1/12
3236A	Telegraph Creek	Stream	Total Coliform	Insufficient Data	3b	-	-	PP - 0/7 VP - 0/1
3236A	Telegraph Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/117 VP - 0/71
Orange River Planning Unit								
3240J	Billy Creek	Estuary	Fluoride	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/2
3240J	Billy Creek	Estuary	Iron	Insufficient Data	3b	-	-	PP - 1/1 VP - 1/1
3240J	Billy Creek	Estuary	Zinc	Not Impaired	2	-	-	PP - 0/246 VP - 0/146
3240J	Billy Creek	Estuary	Biology	Not Impaired	2	-	-	BioRecon assessment rating of "suspect" in 2002. SCI assessment ratings of "good" in 1996, 1997, 1999, and 2002.
3240J	Billy Creek	Estuary	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 4.15 µg/L in 2000, 2.93 µg/L in 2001, and 6.71 µg/L in 2002 is below the IWR threshold level of 11.0 µg/L. Placed on Delist List.
3240J	Billy Creek	Estuary	Lead	Not Impaired	2	-	-	PP - 2/246 VP - 0/146
3240J	Billy Creek	Estuary	Arsenic	Not Impaired	2	-	-	PP - 0/78 VP - 0/98
3240J	Billy Creek	Estuary	Fecal Coliform	Impaired	5	Medium	2009	PP - 49/149 VP - 46/145
3240J	Billy Creek	Estuary	Copper	Not Impaired	2	-	-	PP - 10/197 VP - 5/146

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240J	Billy Creek	Estuary	pH	Not Impaired	2	-	-	PP - 2/252 VP - 1/143
3240J	Billy Creek	Estuary	Turbidity	Not Impaired	2	-	-	PP - 1/252 VP - 1/148
3240J	Billy Creek	Estuary	Dissolved Oxygen	Impaired, but a TMDL Is Not Required	4c	-	-	PP - 128/252 VP - 76/143. DO values do not meet applicable DO criterion. However, nutrients are not causing impairment based on chlorophyll data, and TN, TP, and BOD do not exceed the 70th percentile screening level values (TN = 0.92 [148 observations], TP = 0.15 [146 observations], and BOD = 1.8 [145 observations]). Data indicate that low DO levels are a natural condition. Placed on Delist List.
3240K	Orange River	Stream	Chromium III	Insufficient Data	3b	-	-	PP - No Data VP - 0/1
3240K	Orange River	Stream	Conductance	Not Impaired	2	-	-	PP - 0/254 VP - 0/150
3240K	Orange River	Stream	pH	Not Impaired	2	-	-	PP - 1/254 VP - 0/150
3240K	Orange River	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/253 VP - 0/149
3240K	Orange River	Stream	Lead	Not Impaired	2	-	-	PP - 0/31 VP - 0/31
3240K	Orange River	Stream	Biology	Not Impaired	2	-	-	BioRecon assessment ratings of "healthy" in 1997 and 2000. SCI assessment ratings of "excellent" in 1993, 1994, 1995, 1997, and 2000.

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240K	Orange River	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 8.74 μg/L in 2000, 3.97 μg/L in 2001, and 4.22 μg/L in 2002 is below the IWR threshold level of 20.0 μg/L.
3240K	Orange River	Stream	Fecal Coliform	Not Impaired	2	-	-	PP - 6/154 VP - 9/146
3240K	Orange River	Stream	Copper	Not Impaired	2	-	-	PP - 2/197 VP - 3/147
3240K	Orange River	Stream	Unionized Ammonia	Not Impaired	2	-	-	PP - 0/10 VP - 0/1
3240K	Orange River	Stream	Iron	Insufficient Data	3b	-	-	PP - 0/3 VP - 0/3
3240K	Orange River	Stream	Dissolved Oxygen	Not Impaired	2	-	-	PP - 155/254 VP - 88/150. Impaired based on the IWR thresholds, but the WBID meets aquatic life use support based on bioassessment data. Nutrients are not a cause of impairment based on chlorophyll data, and TN, TP, and BOD do not exceed the 70th percentile screening level values. Data indicate that low DO levels are a natural condition.
3240K	Orange River	Stream	Zinc	Not Impaired	2	-	-	PP - 0/240 VP - 0/147
3240K	Orange River	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/5 VP - 0/4
3240K	Orange River	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/78 VP - 0/99
3240K	Orange River	Stream	Total Coliform	Insufficient Data	3b	-	-	PP - 0/2 VP - No Data
Caloosahatchee Estuary Planning Unit								
3240A	Tidal Caloosahatchee	Estuary	Arsenic	Not Impaired	2	-	-	PP - 0/119 VP - 0/157

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240A	Tidal Caloosahatchee	Estuary	Fecal Coliform	Impaired	5	Medium	2009	PP - 147/516 VP - 134/521
3240A	Tidal Caloosahatchee	Estuary	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll of 12.21 μg/L in 1999, 17.21 μg/L in 2000, 17.51 μg/L in 2001, and 19.22 μg/L in 2002 is above the IWR threshold level of 11.0 μg/L. Data indicate that the WBID is TN limited (TN/TP ratio mean = 7.77 with a standard deviation of 17.81, range 150 - 249.75, 556 observations).
3240A	Tidal Caloosahatchee	Estuary	Copper	Impaired	5	Medium	2009	PP - 66/317 VP - 34/228
3240A	Tidal Caloosahatchee	Estuary	Dissolved Oxygen	Impaired	5	Medium	2009	PP - 282/851 VP - 203/583. BOD, at 2.4 mg/L, and nutrients are identified as the causative pollutants.
3240A	Tidal Caloosahatchee	Estuary	Total Coliform	Insufficient Data	3b	-	-	PP - 0/2 VP - No Data
3240A	Tidal Caloosahatchee	Estuary	Zinc	Not Impaired	2	-	-	PP - 4/370 VP - 0/228
3240A	Tidal Caloosahatchee	Estuary	Lead	Not Impaired	2	-	-	PP - 5/370 VP - 0/228
3240A	Tidal Caloosahatchee	Estuary	pH	Not Impaired	2	-	-	PP - 33/836 VP - 20/580
3240A	Tidal Caloosahatchee	Estuary	Turbidity	Not Impaired	2	-	-	PP - 6/845 VP - 6/559
3240B	Tidal Caloosahatchee	Estuary	Fecal Coliform	Impaired	5	Medium	2009	PP - 36/115 VP - 32/111
3240B	Tidal Caloosahatchee	Estuary	Dissolved Oxygen	Impaired	5	Medium	2009	PP - 82/300 VP - 57/150. Impaired based on the IWR threshold. Nutrients are identified as the causative pollutant.

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240B	Tidal Caloosahatchee	Estuary	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll of 21.42 μg/L in 2000, followed by an annual mean of 8.92 μg/L in 2002. Data indicate that the WBID is TN limited (TN/TP ratio mean = 8.94 with a standard deviation of 14.52, range -39.2 - 141, 201 observations).
3240B	Tidal Caloosahatchee	Estuary	Arsenic	Not Impaired	2	-	-	PP - 0/44 VP - 0/65
3240B	Tidal Caloosahatchee	Estuary	Zinc	Not Impaired	2	-	-	PP - 0/200 VP - 0/109
3240B	Tidal Caloosahatchee	Estuary	Lead	Not Impaired	2	-	-	PP - 2/200 VP - 2/109
3240B	Tidal Caloosahatchee	Estuary	Copper	Not Impaired	2	-	-	PP - 7/158 VP - 4/109
3240B	Tidal Caloosahatchee	Estuary	pH	Not Impaired	2	-	-	PP - 3/342 VP - 7/150
3240B	Tidal Caloosahatchee	Estuary	Turbidity	Not Impaired	2	-	-	PP - 8/311 VP - 1/159
3240C	Tidal Caloosahatchee	Stream	Conductance	Impaired, but a TMDL is not required	4c	-	-	PP - 118/350 VP - 106/282 Land use data indicate that conductance is due to a natural condition (tidally influenced).
3240C	Tidal Caloosahatchee	Stream	Copper	Not Impaired	2	-	-	PP - 0/211 VP - 0/190
3240C	Tidal Caloosahatchee	Stream	Dissolved Oxygen	Impaired	5	Medium	2009	PP - 259/331 VP - 216/282. DO values do not meet the applicable DO criterion, and nutrients are the causative pollutant based on chlorophyll data.
3240C	Tidal Caloosahatchee	Stream	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Average annual chlorophyll mean of 24.77 μg/L in 2000, 11.87 μg/L in 2001, and 19.97 μg/L in 2002.

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240C	Tidal Caloosahatchee	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/5 VP - No Data
3240C	Tidal Caloosahatchee	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/1 VP - No Data
3240C	Tidal Caloosahatchee	Stream	Cadmium	Insufficient Data	3b	-	-	PP - 1/1 VP - No Data
3240C	Tidal Caloosahatchee	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/100 VP - 0/128
3240C	Tidal Caloosahatchee	Stream	Zinc	Not Impaired	2	-	-	PP - 1/234 VP - 1/190
3240C	Tidal Caloosahatchee	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 83/198 VP - 84/194
3240C	Tidal Caloosahatchee	Stream	Lead	Not Impaired	2	-	-	PP - 0/31 VP - 1/44
3240C	Tidal Caloosahatchee	Stream	pH	Not Impaired	2	-	-	PP - 3/342 VP - 3/291
3240C	Tidal Caloosahatchee	Stream	Turbidity	Not Impaired	2	-	-	PP - 8/311 VP - 9/268
3240E	Yellow Fever Creek	Estuary	Arsenic	Not Impaired	2	-	-	PP - 0/36 VP - 0/51
3240E	Yellow Fever Creek	Estuary	Lead	Not Impaired	2	-	-	PP - 1/56 VP - 3/71
3240E	Yellow Fever Creek	Estuary	Fecal Coliform	Impaired	5	Medium	2009	PP - 13/56 VP - 20/66
3240E	Yellow Fever Creek	Estuary	Copper	Not Impaired	2	-	-	PP - 2/56 VP - 3/71
3240E	Yellow Fever Creek	Estuary	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 3.33 μg/L in 2000, 3.67 μg/L in 2001, and 3.08 μg/L in 2002 is below the IWR threshold level of 11.0 μg/L.
3240E	Yellow Fever Creek	Estuary	Zinc	Not Impaired	2	-	-	PP - 0/56 VP - 0/71
3240E	Yellow Fever Creek	Estuary	Fluoride	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/1
3240E	Yellow Fever Creek	Estuary	Malathion	Insufficient Data	3b	-	-	PP - No Data VP - 4/4
3240E	Yellow Fever Creek	Estuary	pH	Not Impaired	2	-	-	PP - 0/1 VP - 0/73
3240E	Yellow Fever Creek	Estuary	Turbidity	Not Impaired	2	-	-	PP - 0/57 VP - 0/68
3240E	Yellow Fever Creek	Estuary	Biology	Not Impaired	2	-	-	SCI assessment rating of "excellent" in 1998.

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240E	Yellow Fever Creek	Estuary	Dissolved Oxygen	Impaired, but a TMDL is not required	4c	-	-	PP - 36/58 VP - 46/73. DO values do not meet applicable DO criterion. However, nutrients are not causing impairment, and there was an SCI assessment rating of "excellent" in 1998, indicating the WBID meets aquatic life use support. Data indicate that low DO levels are a natural condition.
3240E 1	Hancock Creek	Estuary	Arsenic	Not Impaired	2	-	-	PP - 0/60 VP - 0/82
3240E 1	Hancock Creek	Estuary	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll of 11.73 μg/L in 2000, followed by an annual mean of 7.67 μg/L in 2002. Data indicate that the WBID is TN limited (TN/TP ratio mean = 8.44 with a standard deviation of 10.79, range 0.13 - 95, 144 observations).
3240E 1	Hancock Creek	Estuary	Copper	Not Impaired	2	-	-	PP - 34/197 VP - 7/130
3240E 1	Hancock Creek	Estuary	Dissolved Oxygen	Impaired	5	Medium	2009	PP - 111/225 VP - 64/119 BOD, at 2.5 mg/L, and nutrients are identified as the causative pollutants.
3240E 1	Hancock Creek	Estuary	Fecal Coliform	Impaired	5	Medium	2009	PP - 30/130 VP - 27/130
3240E 1	Hancock Creek	Estuary	Lead	Not Impaired	2	-	-	PP - 0/222 VP - 0/130
3240E 1	Hancock Creek	Estuary	pH	Not Impaired	2	-	-	PP - 1/225 VP - 0/119

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240E 1	Hancock Creek	Estuary	Turbidity	Not Impaired	2	-	-	PP - 0/225 VP - 0/130
3240E 1	Hancock Creek	Estuary	Zinc	Not Impaired	2	-	-	PP - 0/222 VP - 0/130
3240F	Daughtrey Creek	Stream	Biology	Not Impaired	2	-	-	BioRecon assessment rating of "healthy" in 1996, and SCI assessment ratings of "excellent" in 1996 and 1998.
3240F	Daughtrey Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 23/507 VP - 30/261
3240F	Daughtrey Creek	Stream	Dissolved Oxygen	Impaired, but a TMDL is not required	4c	-	-	PP - 418/506 VP - 216/261. DO values do not meet applicable DO criterion; however, based on bioassessment data, the WBID meets aquatic life use support. Nutrients are not causing impairment based on chlorophyll data, and TN, TP, and BOD do not exceed the 70th percentile screening level values. Data indicate that low DO levels are a natural condition.
3240F	Daughtrey Creek	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240F	Daughtrey Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/507 VP - 0/261
3240F	Daughtrey Creek	Stream	Turbidity	Not Impaired	2	-	-	PP - 1/507 VP - 2/275

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240F	Daughtrey Creek	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 9.28 µg/L in 2000, 5.59 µg/L in 2001, and 10.21 µg/L in 2002 is below the IWR threshold level of 20.0 µg/L. Placed on Delist List.
3240F	Daughtrey Creek	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240F	Daughtrey Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/128 VP - 01/175
3240F	Daughtrey Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/506 VP - 0/261
3240F	Daughtrey Creek	Stream	Lead	Not Impaired	2	-	-	PP - 1/65 VP - 1/37
3240F	Daughtrey Creek	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 41/275 VP - 43/274
3240F	Daughtrey Creek	Stream	Copper	Not Impaired	2	-	-	PP - 1/397 VP - 1/274
3240F	Daughtrey Creek	Stream	Iron	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240G	Trout Creek	Stream	Conductance	Impaired	5	Medium	2009	PP - 16/124 VP - 14/72 Impairment for conductance is due to agricultural land use.
3240G	Trout Creek	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 9.60 µg/L in 2000, 1.76 µg/L in 2001, and 1.57 µg/L in 2002 is below the IWR threshold level of 20.0 µg/L.
3240G	Trout Creek	Stream	Chromium III	Insufficient Data	3b	-	-	PP - 0/1 VP - No Data
3240G	Trout Creek	Stream	Biology	Not Impaired	2	-	-	SCI assessment rating of "excellent" in 1998.
3240G	Trout Creek	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/3 VP - 0/1

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240G	Trout Creek	Stream	BOD 5-Day	Not Impaired	2	-	-	BOD mean for the verified period is 1.5 mg/L (72 observations), which is below the screening level for state streams. Placed on Delist List.
3240G	Trout Creek	Stream	Copper	Not Impaired	2	-	-	PP - 0/94 VP - 0/70
3240G	Trout Creek	Stream	Lead	Not Impaired	2	-	-	PP - 0/10 VP - 0/10
3240G	Trout Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/120 VP - 0/71
3240G	Trout Creek	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/120 VP - 0/71
3240G	Trout Creek	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 20/70 VP - 22/70
3240G	Trout Creek	Stream	Iron	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240G	Trout Creek	Stream	Dissolved Oxygen	Impaired, but a TMDL Is Not Required	4c	-	-	PP - 81/120 VP - 55/71. Impaired based on the IWR thresholds. However, nutrients are not impaired based on chlorophyll data, and TN, TP, and BOD do not exceed the 70th percentile screening level values (TN = 0.84 [73 observations], TP = 0.05 [73 observations], and BOD = 1.5 [72 observations]), and the WBID supports a healthy biological community. Data indicate that low DO levels are a natural condition. Placed on Delist List.
3240G	Trout Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/37 VP - 0/46
3240G	Trout Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/117 VP - 0/70

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240H	Whisky Creek (Wyoua Creek)	Stream	Alkalinity	Insufficient Data	3b	-	-	PP - No Data VP - 0/4
3240H	Whisky Creek (Wyoua Creek)	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/78 VP - 0/102
3240H	Whisky Creek (Wyoua Creek)	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 4.09 μg/L in 2000, 4.32 μg/L in 2001, and 6.69 μg/L in 2002 is below the IWR threshold level of 20.0 μg/L.
3240H	Whisky Creek (Wyoua Creek)	Stream	Chromium III	Insufficient Data	3b	-	-	PP - No Data VP - 0/4
3240H	Whisky Creek (Wyoua Creek)	Stream	Conductance	Impaired, but a TMDL Is Not Required	4c	-	-	PP - 41/243 VP - 31/159 Land use data indicate that conductance is due to a natural condition (tidally influenced).
3240H	Whisky Creek (Wyoua Creek)	Stream	Copper	Not Impaired	2	-	-	PP - 3/202 VP - 3/148

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240H	Whisky Creek (Wyoua Creek)	Stream	Dissolved Oxygen	Impaired, but a TMDL Is Not Required	4c	-	-	PP - 136/243 VP - 94/159. Impaired based on the IWR thresholds. However, nutrients are not the cause of impairment based on chlorophyll data, and TN, TP, and BOD do not exceed the 70th percentile screening level values (TN = 0.51 [167 observations], TP = 0.05 [163 observations], and BOD = 1.5 [167 observations]). Data indicate that low DO levels are a natural condition.
3240H	Whisky Creek (Wyoua Creek)	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 25/142 VP - 28/148
3240H	Whisky Creek (Wyoua Creek)	Stream	Lead	Not Impaired	2	-	-	PP - 0/29 VP - 5/35
3240H	Whisky Creek (Wyoua Creek)	Stream	Malathion	Insufficient Data	3b	-	-	PP - No Data VP - 3/3
3240H	Whisky Creek (Wyoua Creek)	Stream	pH	Not Impaired	2	-	-	PP - 1/243 VP - 0/159
3240H	Whisky Creek (Wyoua Creek)	Stream	Total Coliform	Insufficient Data	3b	-	-	PP - No Data VP - 0/4
3240H	Whisky Creek (Wyoua Creek)	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/240 VP - 0/148
3240H	Whisky Creek (Wyoua Creek)	Stream	Zinc	Not Impaired	2	-	-	PP - 0/240 VP - 0/148
3240I	Manuel Branch	Estuary	Zinc	Not Impaired	2	-	-	PP - 0/127 VP - 0/104
3240I	Manuel Branch	Estuary	Iron	Planning List	3c	-	-	PP - 13/13 VP - 13/13
3240I	Manuel Branch	Estuary	Lead	Impaired	5	Medium	2009	PP - 9/127 VP - 21/104
3240I	Manuel Branch	Estuary	Total Coliform	Impaired	5	Medium	2009	PP - 10/16 VP - 13/24

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240I	Manuel Branch	Estuary	Fecal Coliform	Impaired	5	Medium	2009	PP - 28/91 VP - 44/113
3240I	Manuel Branch	Estuary	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll means of 3.89 µg/L in 1999, 4.75 µg/L in 2000, 6.26 µg/L in 2001, 10.31 µg/L in 2002, and 3.08 µg/L in 2003. Placed on Delist List.
3240I	Manuel Branch	Estuary	Aluminum	Insufficient Data	3b	-	-	PP- 0/12 VP - 0/12
3240I	Manuel Branch	Estuary	Cadmium	Insufficient Data	3b	-	-	PP- No Data VP - 0/1
3240I	Manuel Branch	Estuary	Fluoride	Insufficient Data	3b	-	-	PP- 0/2 VP - 0/2
3240I	Manuel Branch	Estuary	pH	Not Impaired	2	-	-	PP- 1/144 VP - 2/121
3240I	Manuel Branch	Estuary	Turbidity	Not Impaired	2	-	-	PP- 0/145 VP - 4/113
3240I	Manuel Branch	Estuary	Copper	Impaired	5	Medium	2009	PP - 8/102 VP - 22/104
3240I	Manuel Branch	Estuary	Arsenic	Not Impaired	2	-	-	PP - 0/38 VP - 0/75
3240I	Manuel Branch	Estuary	Mercury	Insufficient Data	3b	-	-	PP - 2/2 VP - 2/2
3240I	Manuel Branch	Estuary	Malathion	Planning List	3c	-	-	PP - 3/3 VP - 11/11

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240I	Manuel Branch	Estuary	Dissolved Oxygen	Impaired, but a TMDL Is Not Required	4c	-	-	PP - 53/144 VP - 47/120. DO values do not meet applicable DO criterion; however, nutrients are not impaired based on chlorophyll data, and TN, TP, and BOD do not exceed the 70th percentile screening level values (TN = 0.82 [122 observations], TP = 0.05 [70 observations], and BOD = 2.0 [87 observations]). Data indicate that low DO levels are a natural condition. Placed on Delist List.
3240L	Gilchrest Drain-Powel	Stream	Conductance	Not Impaired	2	-	-	PP - 1/232 VP - 1/40
3240L	Gilchrest Drain-Powel	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240L	Gilchrest Drain-Powel	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 31/136 VP - 32/139
3240L	Gilchrest Drain-Powel	Stream	Zinc	Not Impaired	2	-	-	PP - 0/231 VP - 0/139
3240L	Gilchrest Drain-Powel	Stream	Lead	Not Impaired	2	-	-	PP - 0/26 VP - 0/23
3240L	Gilchrest Drain-Powel	Stream	Copper	Not Impaired	2	-	-	PP - 0/185 VP - 0/139
3240L	Gilchrest Drain-Powel	Stream	Iron	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240L	Gilchrest Drain-Powel	Stream	pH	Not Impaired	2	-	-	PP - 0/232 VP - 0/140
3240L	Gilchrest Drain-Powel	Stream	Turbidity	Not Impaired	2	-	-	PP - 2/232 VP - 1/140
3240L	Gilchrest Drain-Powel	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240L	Gilchrest Drain-Powel	Stream	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll of 20.02 μg/L in 2002 is above the IWR threshold level of 20.0 μg/L. Data indicate that the WBID is co-limited for TN and TP (TN/TP ratio mean = 10.07 with a standard deviation of 15.41, range 0.14 - 123, 143 observations).
3240L	Gilchrest Drain-Powel	Stream	Dissolved Oxygen	Impaired	5	Medium	2009	PP - 172/232 VP - 113/140. Impaired based on the IWR thresholds. Nutrients are identified as the causative pollutant.
3240L	Gilchrest Drain-Powel	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/69 VP - 0/91
3240M	Stroud Creek	Stream	Lead	Not Impaired	2	-	-	PP - 0/26 VP - 0/17
3240M	Stroud Creek	Stream	Biology	Not Impaired	2	-	-	BioRecon assessment rating of "suspect" in 1996. SCI assessment ratings of "excellent" in 1995 and 1996.
3240M	Stroud Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 11/231 VP - 10/136
3240M	Stroud Creek	Stream	Copper	Not Impaired	2	-	-	PP - 1/188 VP - 1/135
3240M	Stroud Creek	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 23/134 VP - 25/135
3240M	Stroud Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/66 VP - 0/87
3240M	Stroud Creek	Stream	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll of 33.64 μg/L in 2000, 5.51 μg/L in 2001, and 11.88 μg/L in 2002.

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240M	Stroud Creek	Stream	Dissolved Oxygen	Not Impaired	2	-	-	PP - 181/231 VP - 110/136. Impaired based on the IWR thresholds. However, bioassessment data indicate the WBID meets aquatic life use support.
3240M	Stroud Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/229 VP - 0/135
3240M	Stroud Creek	Stream	pH	Not Impaired	2	-	-	PP - 1/231 VP - 0/136
3240M	Stroud Creek	Stream	Turbidity	Not Impaired	2	-	-	PP - 4/231 VP - 3/136
3240M	Stroud Creek	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/2 VP - 0/1
3240N	Owl Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 1/69 VP - 1/70
3240N	Owl Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/69 VP - 0/70
3240N	Owl Creek	Stream	Turbidity	Not Impaired	2	-	-	PP - 0/69 VP - 0/70
3240N	Owl Creek	Stream	Copper	Not Impaired	2	-	-	PP - 0/69 VP - 1/70
3240N	Owl Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/36 VP - 0/46
3240N	Owl Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/69 VP - 0/70
3240N	Owl Creek	Stream	Lead	Insufficient Data	3b	-	-	PP - 0/5 VP - 0/11
3240N	Owl Creek	Stream	Nutrients (Chlorophyll a)	Not Impaired	2	-	-	Annual average chlorophyll of 9.37 μg/L in 2000, 12.32 μg/L in 2001, and 5.65 μg/L in 2002 is below the IWR threshold level of 20.0 μg/L.
3240N	Owl Creek	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 25/68 VP - 29/70

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240N	Owl Creek	Stream	Dissolved Oxygen	Impaired, but a TMDL is Not Required	4c	-	-	PP - 57/69 VP - 58/70. Impaired based on the IWR thresholds. However, nutrients are not causing impairment based on chlorophyll data, and TN, TP, and BOD do not exceed the 70th percentile screening level values (TN = 0.52 [76 observations], TP = 0.05 [76 observations], and BOD = 1.5 [76 observations]). Data indicate that low DO levels are a natural condition.
3240Q	Popash Creek	Stream	Conductance	Not Impaired	2	-	-	PP - 1/312 VP - 1/163
3240Q	Popash Creek	Stream	Fluoride	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240Q	Popash Creek	Stream	Fecal Coliform	Impaired	5	Medium	2009	PP - 29/175 VP - 38/174
3240Q	Popash Creek	Stream	Biology	Not Impaired	2	-	-	SCI assessment ratings of "excellent" in 1996 and "good" in 1998.
3240Q	Popash Creek	Stream	Unionized Ammonia	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240Q	Popash Creek	Stream	Zinc	Not Impaired	2	-	-	PP - 0/311 VP - 0/174
3240Q	Popash Creek	Stream	Lead	Not Impaired	2	-	-	PP - 0/35 VP - 0/24
3240Q	Popash Creek	Stream	Iron	Insufficient Data	3b	-	-	PP - 0/1 VP - 0/1
3240Q	Popash Creek	Stream	pH	Not Impaired	2	-	-	PP - 0/312 VP - 0/163
3240Q	Popash Creek	Stream	Turbidity	Not Impaired	2		-	PP - 4/312 VP - 4/175

WBID	Waterbody Segment	Waterbody Type[1]	Parameters Assessed	1998 303(d) List	EPA's Integrated Report Category[2]	Priority for TMDL Develop-ment	Projected Year for TMDL Develop-ment	Comments[3]
3240Q	Popash Creek	Stream	Dissolved Oxygen	Impaired	5	Medium	2009	PP - 246/312 VP - 130/163. Impaired based on the IWR threshold. Nutrients are identified as the causative pollutant.
3240Q	Popash Creek	Stream	Copper	Not Impaired	2	-	-	PP - 0/248 VP - 1/174
3240Q	Popash Creek	Stream	Arsenic	Not Impaired	2	-	-	PP - 0/76 VP - 0/105
3240Q	Popash Creek	Stream	Nutrients (Chlorophyll a)	Impaired	5	Medium	2009	Annual average chlorophyll of 88.13 μg/L in 2000, and 32.90 μg/L in 2002, is above the IWR threshold level of 20.0 μg/L. Data indicate that the WBID is co-limited for TN and TP (TN/TP ratio mean = 18.50 with a standard deviation of 23.78, range 0.17 - 263, 181 observations).

[1]The designation "stream" includes canals, rivers, and sloughs. The designation "lake" includes some marshes.
[2]The EPA's 305(b)/303(d) Integrated Report categories are as follows:

1 – Attains all designated uses;
2 – Attains some designated uses;
3a – No data and information are available to determine if any designated use is attained;
3b – Some data and information are available, but they are insufficient for determining if any designated use is attained;
3c – Meets Planning List criteria and is potentially impaired for one or more designated uses;
3d – Meets Verified List criteria and is potentially impaired for one or more designated uses;
4a – Impaired for one or more designated uses and the TMDL is complete;
4b – Impaired for one or more designated uses, but no TMDL is required because an existing or proposed pollutant control mechanism provides reasonable assurance that the water will attain standards in the future;
4c – Impaired for one or more designated uses but no TMDL is required because the impairment is not caused by a pollutant; and
5 – Water quality standards are not attained and a TMDL is required.

[3] The Planning Period is shown as PP and the Verified Period is shown as VP.
- – Not applicable.

Table E.2: Water Quality Monitoring Stations Used in the Assessment for the Caloosahatchee Basin, by Planning Unit

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
East Caloosahatchee Planning Unit							
3237A	East Caloosahatchee	Stream	21FLSFWMCULV5	Culvert 5	1997	2003	1750
3237A	East Caloosahatchee	Stream	21FLFTM 28020021	Caloosahatchee R Us 27 Br Moor H	1999	1999	270
3237A	East Caloosahatchee	Stream	21FLFTM 28020020	Caloosahatchee R Ortona Lock Mid	1999	2000	265
3237A	East Caloosahatchee	Stream	21FLFTM 28020022	Caloosahatchee R Moore Haven Loc	2000	2000	27
3237A	East Caloosahatchee	Stream	21FLA 28020022	Caloosahatchee R Moore Haven Loc	1997	1998	74
3237A	East Caloosahatchee	Stream	112WRD 02292480	Caloosahatchee Canal At Ortona Lock Nr La Belle	1999	1999	33
3237A	East Caloosahatchee	Stream	21FLSFWMCR-00.2T	C-43 At S235p Near S-77 In Moorehaven	1997	2003	1151
3237B	Long Hammock Creek	Stream	21FLFTM 28020256FTM	Bwcd C-3(Aka Long Hammock Canal)	2000	2003	452
3237B	Long Hammock Creek	Stream	21FLFTM 28020199	Long Hammock Creek At State Road 80	1999	2000	165
3237C	Lake Hicpochee	Lake	21FLFTM 28020246FTM	Lake Hicpochee (Lh2)	2001	2003	435
3237C	Lake Hicpochee	Lake	21FLFTM 28020245FTM	Lake Hicpochee (Lh1)	2001	2003	433
3237C	Lake Hicpochee	Lake	21FLFTM 28020248FTM	C19 Canal At Lake Hicpochee	2001	2003	434

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3237C	Lake Hicpochee	Lake	21FLFTM 28020247FTM	Lake Hicpochee (Lh3)	2001	2003	435
3237D	Ninemile Canal	Stream	21FLFTM 28020254FTM	Us 27 Canal(1.3 Mile North Of Nine Mile Canal)	1999	2003	695
3237D	Ninemile Canal	Stream	21FLFTM 28020139	9 Mi Canal 4.5 Mi S Moorehaven	1999	2003	705
3237D	Ninemile Canal	Stream	21FLFTM 28020138		2003	2003	26
3246	C-21	Stream	21FLSFWMS4	At Pump Station 4 On The Herbert Hover Dike N A	1997	2003	3206
3246	C-21	Stream	21FLSFWMINDUSCAN	Industrial Canal At County Rd 832 Clewiston	1997	2003	2504
3246	C-21	Stream	21FLSFWMS169	Wayside Park In Clewiston By Boat Ramp Near S-31	1997	2003	2299
West Caloosahatchee Planning Unit							
3235A	West Caloosahatchee	Stream	21FLSFWMS79N	North Side Of Structure S79 On Caloosahatchee Rive	2000	2000	392
3235A	West Caloosahatchee	Stream	21FLFTM 28020019	Caloosahatchee R Franklin Lock L	1999	2000	326
3235A	West Caloosahatchee	Stream	21FLSFWMS79	S-79 Spillway & Lock On Caloosahatchee River Nr	1997	2003	1814
3235A	West Caloosahatchee	Stream	21FLFTM 28020006	Caloos R Sr 78b Br	1999	2000	317
3235A	West Caloosahatchee	Stream	21FLEECO39-GR20	Olga Creek- Sr 80	1997	2002	1655

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3235A	West Caloosahatchee	Stream	21FLSFWMCES01	Caloosahatchee Water Quality Monitoring Station	1999	2002	867
3235A	West Caloosahatchee	Stream	21FLA 28020006	Caloos R Sr 78b Br	1997	1998	145
3235A	West Caloosahatchee	Stream	21FLFTM 28020277FTM	Caloosahatchee River East Of Olga Wtp	2001	2003	372
3235A	West Caloosahatchee	Stream	21FLFTM 28020276FTM	Caloosahatchee River .25 Mi West Of Alva	2001	2003	377
3235B	West Caloosahatchee	Stream	21FLFTM 28020273FTM	Caloosahatchee River At Marker 2	2001	2003	392
3235B	West Caloosahatchee	Stream	21FLFTM 28020274FTM	Caloosahatchee River West Of Sr29 Bridge	2001	2003	390
3235C	Cypress Creek	Stream	21FLFTM 28020042	Cypress Cr Sr 78 Br W Alva	1999	2000	338
3235C	Cypress Creek	Stream	21FLA 28020237	Cypress Creek 2 Mi. Above Sr78	1997	1997	23
3235D	Jacks Branch	Stream	21FLFTM 28020044	Jacks Bran Sr 78 Br Nw Ft Denaud	1999	2002	557
3235D	Jacks Branch	Stream	21FLFTM 28020238	Jack's Branch Above Kirby-Thompson Rd	1999	2003	209
3235D	Jacks Branch	Stream	21FLA 28020238	Jack's Branch Above Kirby-Thompson Rd	1997	1997	21
3235E	Bee Branch	Stream	21FLFTM 28020301FTM	Bee Branch Site 4	2003	2003	82
3235E	Bee Branch	Stream	21FLFTM 28020300FTM	Bee Branch Site 3	2003	2003	114

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3235E	Bee Branch	Stream	21FLFTM 28020299FTM	Bee Branch Site 2	2003	2003	139
3235E	Bee Branch	Stream	21FLFTM 28020298FTM	Bee Branch Site 1	2003	2003	140
3235F	Pollywog Creek	Stream	21FLFTM 28020268FTM	Pollywog Creek At Sr 78 Near Labelle	1999	2001	347
3235G	Cypress Branch	Stream	21FLA 28020239	Cypress Branch Above State Road 78	1997	1997	22
3235G	Cypress Branch	Stream	21FLFTM 28020239	Cypress Branch Above State Road 78	1999	2000	294
3235H	Hickey Creek	Stream	21FLEECO38-3GR	Hickey Creek- Sr 80	1997	2002	1550
3235I	Bedman Creek	Stream	21FLFTM 28020235	Bedman Cr @ Tuckahoe Rd, Alva	2002	2002	21
3235I	Bedman Creek	Stream	21FLEECO37-4GR	Bedman Creek- Sr 80	1997	2002	1550
3235J	Dog Canal	Stream	21FLFTM 28020290FTM	Dog Canal Site 1	2003	2003	131
3235J	Dog Canal	Stream	21FLFTM 28020292FTM	Dog Canal Site 3	2003	2003	134
3235J	Dog Canal	Stream	21FLFTM 28020293FTM	Dog Canal Site 4	2003	2003	59
3235J	Dog Canal	Stream	21FLFTM 28020291FTM	Dog Canal Site 2	2003	2003	135
3235K	Townsend Canal	Stream	21FLSFWMCR33.5T	Townsend Canal On The North Side Of The State Road	1997	2001	577

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3235K	Townsend Canal	Stream	21FLFTM 28020275FTM	Caloosahatchee River Off Townsend Canal	2001	2003	392
3235K	Townsend Canal	Stream	21FLSFWMCALRIVSW		2002	2003	110
3235K	Townsend Canal	Stream	21FLFTM 28020030	Townsend C Sr 80 Br E Lee-Hendry	1999	2000	291
3235K	Townsend Canal	Stream	21FLFTM 28020250FTM	Townsend Canal	2000	2003	446
3235L	Townsend Canal	Stream	21FLFTM 28020302FTM	Townsend A Site 1	2003	2003	107
3235L	Townsend Canal	Stream	21FLFTM 28020303FTM	Townsend A Site 2	2003	2003	132
3235L	Townsend Canal	Stream	21FLFTM 28020304FTM	Townsend A Site 3	2003	2003	126
3235L	Townsend Canal	Stream	21FLFTM 28020305FTM	Townsend A Site 4	2003	2003	100
3235M	Goodno Canal	Stream	21FLFTM 28020218	Goodno Canal At State Road 80	1999	2000	318
3235N	Roberts Canal	Stream	21FLFTM 28020032	Roberts C Sr 80 Br S Ft Denaud H	1999	2000	337
Telegraph Swamp Planning Unit							
3236A	Telegraph Creek	Stream	21FLEECO29-8GR	Telegraph Creek- Bridge @ T. Cr. Eststes	1997	2002	1791
3236A	Telegraph Creek	Stream	21FLA 28020041	Telegraph Cr Sr 78 Br E Sr 31 In	1997	1998	121

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3236A	Telegraph Creek	Stream	21FLFTM 28020221	Telegraph Creek At Babcocck Ranch	2002	2002	41
Orange River Planning Unit							
3240J	Billy Creek	Estuary	21FLFTM 28020233	Billy's Cr @ Marsh Ave, Ft Myers	1999	2002	39
3240J	Billy Creek	Estuary	21FLEECOBILLGR60	Billy Creek- Ortiz	1997	2002	1596
3240J	Billy Creek	Estuary	21FLEECOBILLGR20	Billy Creek- Palmetto	1997	2002	1618
3240J	Billy Creek	Estuary	21FLA 28020233	Billy's Cr @ Marsh Ave, Ft Myers	1997	1997	16
3240K	Orange River	Stream	21FLEECO40-18GR	Orange River- Buckingham Rd.	1997	2002	1626
3240K	Orange River	Stream	21FLEECO40-32GR	Orange River- N. Of Harnes Marsh	1997	2002	1823
3240K	Orange River	Stream	21FLA 28020148	Orange River Hendry Property	1997	1997	23
3240K	Orange River	Stream	21FLFTM 28020011	Orange River At Fp&L Dischg Cana	2002	2002	19
3240K	Orange River	Stream	21FLFTM 28020148	Orange River Hendry Property	1999	2000	36
Caloosahatchee Estuary Planning Unit							
3240A	Tidal Caloosahatchee	Estuary	21FLA 28020185	Caloosahatchee River At Redfish Pt	1997	1998	82

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3240A	Tidal Caloosahatchee	Estuary	21FLFMRICHA200222	Charlotte Harbor - Caloosahatchee River	2002	2002	23
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMCAL 07	Caloosahatchee River Mile 18	1999	1999	30
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMCAL 05	Caloosahatchee River Mile 14	1999	1999	30
3240A	Tidal Caloosahatchee	Estuary	21FLSCCFMARKER 94	Marker 94	2001	2002	271
3240A	Tidal Caloosahatchee	Estuary	21FLFMRISTR200217	Statenontrend - Caloosahatchee River	2002	2002	28
3240A	Tidal Caloosahatchee	Estuary	21FLFMRISTR200116	Statenontrend - Caloosahatchee River	2001	2001	17
3240A	Tidal Caloosahatchee	Estuary	21FLFMRICHA200225	Charlotte Harbor - Caloosahatchee River	2002	2002	33
3240A	Tidal Caloosahatchee	Estuary	21FLFMRICHA200218	Charlotte Harbor - Caloosahatchee River	2002	2002	23
3240A	Tidal Caloosahatchee	Estuary	21FLEECODEEPGR90	Deep Lagoon- Summerlin W. Of Bass Rd.	1997	2002	1664
3240A	Tidal Caloosahatchee	Estuary	21FLEECODEEPGR50	Deep Lagoon- Gladiolus, W. Of A&W Bulb Rd.	1997	2002	1727
3240A	Tidal Caloosahatchee	Estuary	21FLEECODEEPGR10	Deep Lagoon- Mcgregor Blvd.	1997	2002	1760
3240A	Tidal Caloosahatchee	Estuary	21FLDOH LEE138	Boca Grande Sea Grape #2	2000	2003	128
3240A	Tidal Caloosahatchee	Estuary	21FLFMRICHA200230	Charlotte Harbor - Iona Point	2002	2002	25

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3240A	Tidal Caloosahatchee	Estuary	CAPECRD 242	Caloosahatchee River, Northwest Of Caloosahatchee Bridge	1997	2004	3691
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMCES06	Caloosahatchee Water Quality Monitoring Station	1999	2002	1467
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMCES07	Caloosahatchee Water Quality Monitoring Station	1999	2002	1498
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMCES08	Caloosahatchee Water Quality Monitoring Station	1999	2002	1436
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMHB04	Upstream Negro Head Point Caloosahatchee Estuar	1997	1997	108
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMHB05	Iona Cove Shore Caloosahatchee Estuary	1997	1997	206
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMCAL 09	Caloosahatchee River Mile 24	1999	1999	29
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMCES05	Caloosahatchee Water Quality Monitoring Station	1999	2002	1504
3240A	Tidal Caloosahatchee	Estuary	21FLSFWMHB03	Western Shore ~3 Mi. Dwnstrm. Sr41 Bridge Callo	1997	1997	123
3240A	Tidal Caloosahatchee	Estuary	CAPECRD 350	Caloosahatchee River, East Of Chantry Canal	1997	2004	4353
3240B	Tidal Caloosahatchee	Estuary	21FLSFWMCES04	Caloosahatchee Water Quality Monitoring Station	1999	2002	1495
3240B	Tidal Caloosahatchee	Estuary	21FLSFWMHB01	Sw. Side Beautiful Island Caloosahatchee Estuar	1997	1997	126
3240B	Tidal Caloosahatchee	Estuary	21FLEECO18-6GR	Marsh Point- Sr 78	1997	2002	1486

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3240B	Tidal Caloosahatchee	Estuary	21FLSFWMCAL 03	Caloosahatchee River Mile 12	1999	1999	30
3240B	Tidal Caloosahatchee	Estuary	21FLSFWMHB02	Western Shore ~1 Mile Upstrm. Sr41 Bridge Caloo	1997	1997	123
3240B	Tidal Caloosahatchee	Estuary	21FLSFWMCAL 01	Caloosahatchee River Mile 4	1999	1999	30
3240B	Tidal Caloosahatchee	Estuary	21FLFMRICHA200216	Charlotte Harbor - Caloosahatchee River	2002	2002	23
3240B	Tidal Caloosahatchee	Estuary	21FLEECO21-7GR	Chapel Branch- Sr 78	1997	2002	1013
3240C	Tidal Caloosahatchee	Stream	21FLEECO26-GR20	Kickapoo Creek- Sr 78	1997	2002	1876
3240C	Tidal Caloosahatchee	Stream	112WRD 02292795	Caloosahatchee River At Alva Fla	1997	1998	419
3240C	Tidal Caloosahatchee	Stream	21FLEECO28-5GR	Otter Creek- Duke Hwy.	1997	2002	1358
3240C	Tidal Caloosahatchee	Stream	21FLSFWMCES02	Caloosahatchee Water Quality Monitoring Station	1999	2002	1494
3240C	Tidal Caloosahatchee	Stream	21FLSFWMCES03	Caloosahatchee Water Quality Monitoring Station	1999	2002	1645
3240C	Tidal Caloosahatchee	Stream	21FLEECO25-GR20	Palm Creek- Sr 78	1997	2002	1416
3240E	Yellow Fever Creek	Estuary	21FLEECOYFC-CI	Yellow Fever Creek- Sr 78 Herron Rd	1997	2002	1667
3240E	Yellow Fever Creek	Estuary	21FLA 28020035	Yellow Fever Cr Sr 78 Br W Ft My	1998	1998	22

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3240E	Yellow Fever Creek	Estuary	21FLFTM 28020035	Yellow Fever Cr Sr 78 Br W Ft My	2001	2002	128
32400	Hancock Creek	Estuary	21FLEECO16-3GR	Hancock Creek- Hb Pkwy	1997	2002	1545
32400	Hancock Creek	Estuary	21FLEECO16-18GR	Hancock Creek- Under 78	1997	2002	1593
3240F	Daughtrey Creek	Stream	21FLEECOGATRGR91	Gator Slough- I-75	1997	2002	1304
3240F	Daughtrey Creek	Stream	21FLEECO20A-19GR	Daughtrey Creek- E. Branch I-75	1997	2002	1092
3240F	Daughtrey Creek	Stream	21FLEECO20A-11GR	Daughtrey Creek- E. Branch Sr 78	1997	2002	908
3240F	Daughtrey Creek	Stream	21FLEECO20-9GR	Daughtrey Creek- Sr 78	1997	2002	1394
3240F	Daughtrey Creek	Stream	21FLEECO20-29GR	Daughtrey Creek- Nalle Grade Bridge	1997	2002	1410
3240F	Daughtrey Creek	Stream	21FLA 28020231	Daughtrey Cr @ Bright Rd, N Ft Myers	1998	1998	22
3240G	Trout Creek	Stream	21FLEECO27-6GR	Trout/ Oak Creek- N. River Rd.	1997	2002	1597
3240G	Trout Creek	Stream	112WRD 264608081454103	43s25e01 L-2328 Tuckers Corner	2000	2000	1
3240G	Trout Creek	Stream	21FLA 28020040	Trout Cr Sr 78 Br E Sr 31 Inters	1998	1998	22
3240H	Whisky Creek (Wyoua Creek)	Stream	21FLFTM 28020297FTM	Whiskey Creek Site 4	2003	2003	33

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3240H	Whisky Creek (Wyoua Creek)	Stream	21FLFTM 28020296FTM	Whiskey Creek Site 3	2003	2003	33
3240H	Whisky Creek (Wyoua Creek)	Stream	21FLFTM 28020295FTM	Whiskey Creek Site 2	2003	2003	33
3240H	Whisky Creek (Wyoua Creek)	Stream	21FLEECOWHISGR10	Whiskey Creek- Whiskey Creek Rd.	1997	2002	2073
3240H	Whisky Creek (Wyoua Creek)	Stream	21FLFTM 28020294FTM	Whiskey Creek Site 1	2003	2003	28
3240H	Whisky Creek (Wyoua Creek)	Stream	21FLEECOWHISGR50	Whiskey Creek- Summerlin And Brantly	1997	2002	1673
3240I	Manuel Branch	Estuary	21FLA 28020225	Manual Branch At Mcgregor Blvd(Sr867)	1998	1998	16
3240I	Manuel Branch	Estuary	21FLEECOPOWLGR81	Powell Creek- Evelena @ Weir	1997	2002	1526
3240I	Manuel Branch	Estuary	21FLFTM 28020288FTM	Manuels Branch Site3	2003	2003	136
3240I	Manuel Branch	Estuary	21FLFTM 28020289FTM	Manuels Branch Site 4	2003	2003	163
3240I	Manuel Branch	Estuary	21FLFTM 28020287FTM	Manuels Branch Site 2	2003	2003	136
3240I	Manuel Branch	Estuary	21FLFTM 28020286FTM	Manuels Branch Site 1	2003	2003	137
3240I	Manuel Branch	Estuary	21FLFTM 28020225	Manual Branch At Mcgregor Blvd(Sr867)	1999	2000	234
3240I	Manuel Branch	Estuary	21FLFTM 28020249FTM	Manuel's Branch Upstream Of The Weir Near The Scho	1999	2002	552

WBID	Waterbody Segment	Waterbody Type	STORET Station ID	Station Description	BD	ED	# of Observations
3240L	Gilchrest Drain--Powel	Stream	21FLA 28020036	Powell Cr Sr 78 Br N Ft Myers Le	1998	1998	23
3240L	Gilchrest Drain--Powel	Stream	21FLEECOPOWLGR51	Powell Creek- Evelena & Bayshore	1997	2002	1667
3240L	Gilchrest Drain--Powel	Stream	21FLEECOPOWLGR20	Powell Creek- Bayshore	1997	2002	1480
3240M	Stroud Creek	Stream	21FLEECO24-19GR	Stroud Creek- Merle Dr.	1997	2002	1576
3240M	Stroud Creek	Stream	21FLEECO24-7GR	Stroud Creek- Sr 78	1997	2002	1481
3240M	Stroud Creek	Stream	21FLA 28020039	Stroud Cr Sr 78 Br Ne Of North F	1997	1997	16
3240N	Owl Creek	Stream	21FLEECO27O-GR20	Trout/ Oak Creek- Owl Creek @ Sr 78	1997	2002	1692
3240Q	Popash Creek	Stream	21FLEECO22-18GR	Bayshore Creek- Henderson Grade	1997	2002	1309
3240Q	Popash Creek	Stream	21FLEECO23-27GR	Popash Creek- Nalle Grade	1997	2002	1404
3240Q	Popash Creek	Stream	21FLA 28020232	Popash Cr @ Triplette Rd, N Ft Myers	1998	1998	23
3240Q	Popash Creek	Stream	21FLEECO22-7GR	Bayshore Creek- Sr78	1997	2002	1168

Appendix F: Permitted Discharge Facilities, Hazardous Waste Sites, Landfills, and Brownfields in the Caloosahatchee Basin, by Planning Unit

Table F.1: Permitted Facilities with Nonsurface Water Discharges, by Planning Unit

NAME	FACILITY TYPE[1]	STATUS	PLANNING UNIT
AIRGLADES INDUSTRIAL PARK WWTP	DW	A	East Caloosahatchee
BENBOW WWTP	DW	A	East Caloosahatchee
GLADES COUNTY WWTP (AKA: CORRECTIONAL)	DW	A	East Caloosahatchee
GOLFER'S HEAVEN @ HENDRY ISLES	DW	A	East Caloosahatchee
HENDRY ISLES RESORT	DW	A	East Caloosahatchee
HOLIDAY TRAV-L-PARK FORMERLY CLEWISTON KOA	DW	A	East Caloosahatchee
KREHLING INDUSTRIES MOORE HAVEN PLANT #15	CBP	A	East Caloosahatchee
MAGNOLIA PACKING FKA DOLE CITRUS	IW	A	East Caloosahatchee
MEADOWLARK CAMPGROUND	DW	A	East Caloosahatchee
PALMDALE SAND MINE (RINKER)	IW	A	East Caloosahatchee
RIVER GARDENS AKA LOCKVIEW AKA MOOREHAVEN RIVER GARDENS	DW	A	East Caloosahatchee
RIVER OAKS SUBDIVISION	DW	A	East Caloosahatchee
ROBIN'S NEST RV RESORT AKA:ROYAL PALM, RAINBOW RV PARK	DW	A	East Caloosahatchee
SOUTHERN GARDENS CITRUS PROCESSING	IW	A	East Caloosahatchee
SPORTSMANS VILLAGE RV CONDO WWTP	DW	A	East Caloosahatchee
US SUGAR CORP - CLEWISTON MILL	IW	A	East Caloosahatchee
WITHERSPOON SAND MINE FL ROCK IND INC	IW	A	East Caloosahatchee
ALVA SCHOOLS AKA: ALVA ELEM /MIDDLE	DW	A	West Caloosahatchee
CHARLESTON PARK STP	DW	A	West Caloosahatchee
CITRUS BELLE PACKING PLANT	IW	A	West Caloosahatchee
GRANDMA'S GROVE RV PARK STP	DW	A	West Caloosahatchee
GREENTREE SOUTH SEWAGE TREATMENT PLANT	DW	A	West Caloosahatchee
JACK M BERRY INC PROCESSING PLANT	IW	A	West Caloosahatchee
KREHLING PLANT 9 LABELLE	CBP	A	West Caloosahatchee
LABELLE LABOR VILLAGE STP	DW	A	West Caloosahatchee
LABELLE WWTP #1	DW	A	West Caloosahatchee
MAPLE CORNER WWTP	DW	A	West Caloosahatchee
MERIT PURE STATION (MERIT SHELL)	PET	A	West Caloosahatchee
MUSE SCHOOL	DW	A	West Caloosahatchee
OAK PARK MOBILE HOME VILLAGE	DW	A	West Caloosahatchee
PALM & PINES MHP	DW	A	West Caloosahatchee
PORT LABELLE WWTP	DW	A	West Caloosahatchee
RIVER BEND MOTORCOACH RESORT (FKA: PLANTATION RV PARK)	DW	A	West Caloosahatchee
RIVERBEND ESTATES WWTP	DW	A	West Caloosahatchee
SAIA MOTOR FREIGHT	NEX	A	West Caloosahatchee
SOUTH FLORIDA UNITED METHODIST CAMP	DW	A	West Caloosahatchee
WHISPER CREEK RV RESORT	DW	A	West Caloosahatchee

NAME	FACILITY TYPE[1]	STATUS	PLANNING UNIT
YODER BROTHERS INC - ALVA FARM RO	IW	A	West Caloosahatchee
ABF FREIGHT SYSTEM, INC.	NEX	A	Orange River
AVERITT EXPRESS FORT MYERS SERVICE CENTER	NEX	A	Orange River
AVERITT EXPRESS, INC.	NEX	A	Orange River
HUT RESTAURANT	DW	A	Orange River
LEHIGH ACRES UTILITIES INC	DW	A	Orange River
MARINER PRODUCTS, INC.	NEX	A	Orange River
THE NEWS-PRESS	NEX	A	Orange River
YELLOW TRANSPORTATION	NEX	A	Orange River
ACE PRESS, INC.	NEX	A	Caloosahatchee Estuary
BAY POINTE CONDOMINIUM	DW	A	Caloosahatchee Estuary
BAYSIDE LAUNDROMAT	IW	A	Caloosahatchee Estuary
CHARLOTTE CO ROCK PLANT EARTHSOUR	IW	A	Caloosahatchee Estuary
CREWS SANITATION CO - REGIONAL RESIDUAL MGMT FACILITY	DW	A	Caloosahatchee Estuary
FONG'S CHINESE RESTAURANT	DW	A	Caloosahatchee Estuary
FORT MYERS BEACH S T P	DW	A	Caloosahatchee Estuary
GARDEN RV PARK WWTP	DW	A	Caloosahatchee Estuary
HIGH POINT SD WWTP	DW	A	Caloosahatchee Estuary
J.C. CRUISES INC	NEX	A	Caloosahatchee Estuary
JULIA PARK	DW	A	Caloosahatchee Estuary
NORTH FORT MYERS UTILITY, DOMESTIC	DW	A	Caloosahatchee Estuary
OLDCASTLE PRECAST INC	CBP	A	Caloosahatchee Estuary
PIONEER VILLAGE WWTP	DW	A	Caloosahatchee Estuary
PRINTER'S INK INTERNATIONAL	NEX	A	Caloosahatchee Estuary
PURRSEAVERANCE M/V	NEX	A	Caloosahatchee Estuary
RIVER TRAILS MOBILE HOME PARK	DW	A	Caloosahatchee Estuary
ROYAL CREST PRINTING HOUSE, INC.	NEX	A	Caloosahatchee Estuary
SCHWAB READY MIX INC	CBP	A	Caloosahatchee Estuary
SEMINOLE CAMPGROUND	DW	A	Caloosahatchee Estuary
SPRING WOODS HOME OWNERS ASSN	DW	A	Caloosahatchee Estuary
SUMMIT READY MIX	CBP	A	Caloosahatchee Estuary
SUPTER TRANSPORT, INC.	NEX	A	Caloosahatchee Estuary
SWAN LAKE MOBILE HOME PARK	DW	A	Caloosahatchee Estuary
THREE LAKES MINE, CORAL ROCK, INC.	IW	A	Caloosahatchee Estuary
TRI CIRCLE PAVERS INC.	NEX	A	Caloosahatchee Estuary
UPRIVER CAMPGROUNDS	DW	A	Caloosahatchee Estuary
WHISPERING PINES CONDO ASSOCIATION	DW	A	Caloosahatchee Estuary

[1]DW = Domestic Waste Water Treatment Plant, IW = Industrial Wastewater Treatment Plant, AFO = Animal Feeding Operation, CBP = Concrete Batch Plant, NEX = Stormwater with no exposure certification.

Table F.2: Permitted Facilities with Surface Water Discharges, by Planning Unit

NAME	CITY	FACILITY TYPE[1]	STATUS	NPDES	DESIGN CAPACITY	PLANNING UNIT
CITY OF CLEWISTON WWTP	CLEWISTON	DW	A	Y	1.5000	East Caloosahatchee
E R JAHNA IND ORTONA MINE	ORTONA	IW	A	Y	4.0000	East Caloosahatchee
FORT MYERS CENTRAL AWWTF	FORT MYERS	DW	A	Y	11.0000	Orange River
FPL FORT MYERS PLANT	FORT MYERS	IW	A	Y	590.6000	Orange River
CITY OF CAPE CORAL	CAPE CORAL	DW	A	Y	15.1000	Caloosahatchee Estuary
FIESTA VILLAGE WWTP	FORT MYERS	DW	A	Y	5.0000	Caloosahatchee Estuary
FORT MYERS SOUTH AWWTP	FT MYERS	DW	A	Y	12.0000	Caloosahatchee Estuary
WATERWAY ESTATES ADVANCED WWTP	N FT MYERS	DW	A	Y	1.5000	Caloosahatchee Estuary

[1]DW = Domestic Wastewater Treatment Plant, IW = Industrial Wastewater Treatment Plant, CBP = Concrete Batch Plant

Table F.3: Hazardous Waste Sites, by Planning Unit

Name	City	County	Status	Operation
West Caloosahatchee Planning Unit				
McCluskey Dump	La Belle	Hendry	Delisted	Landfill/Dump

Table F.4: Permitted Landfill Facilities, by Planning Unit

FACILITY NAME	CITY	STATUS[1]	FACILITY TYPE	PLANNING UNIT
AIRGLADES LF	CLEWISTON	I	SOLID WASTE	East Caloosahatchee
GLADES CO. SAN. LANDFILL #2	MOOREHAVEN	A	SOLID WASTE	East Caloosahatchee
GLADES COUNTY SLF	MOORE HAVEN	I	SOLID WASTE	East Caloosahatchee
HENDRY COUNTY SLF	LABELLE	A	SOLID WASTE	East Caloosahatchee
LABELLE LF	LABELLE	I	SOLID WASTE	West Caloosahatchee
LASSETT EXCAVATING AND FILL	LABELLE	I	SOLID WASTE	West Caloosahatchee
ALLIGATOR TOWING & RECOVERY, INC.	FORT MYERS	I	SOLID WASTE	Orange River
BUCKINGHAM LF	FT MYERS	J	SOLID WASTE	Orange River
CARTER CONTRACTING, INC. (C & D)	ALVA	I	SOLID WASTE	Orange River
RAMCO RECYCLING SYSTEMS	FORT MYERS	K	SOLID WASTE	Caloosahatchee Estuary

[1]A= active, I= inactive, J= closed no monitoring, K= closed with monitoring.

Table F.5: Brownfields, by Planning Unit

Area ID	Area Name	City	County	Acreage	Planning Unit
BF369901000	Ft Myers Coal Gasification Area	Fort Myers	Lee	7	Caloosahatchee Estuary
BF360301000	Ft. Myers Wellfield Area	Ft. Myers	Lee	870	Caloosahatchee Estuary and Orange River

Appendix G: Level 1 Land Use in the Caloosahatchee Basin, by Planning Unit

Table G.1: Level I Land Use in the East Caloosahatchee Planning Unit

Level 1	Type	Percentage of Planning Unit
1000	Urban and Built-Up	3.3
2000	Agriculture (includes improved pasture)	63.2
3000	Rangeland	3.8
4000	Upland Forest	11.0
5000	Water (includes open bay)	1.3
6000	Wetlands	15.6
7000	Barren Land	0.9
8000	Transportation, Communications, and Utilities	0.9
Total		**100**

Table G.2: Level 1 Land Use in the West Caloosahatchee Planning Unit

Level 1	Type	Percentage of Planning Unit
1000	Urban and Built-Up	7.4
2000	Agriculture (includes improved pasture)	45.8
3000	Rangeland	7.8
4000	Upland Forest	20.6
5000	Water (includes open bay)	0.5
6000	Wetlands	16.4
7000	Barren Land	0.8
8000	Transportation, Communications, and Utilities	0.7
Total		**100**

Table G.3: Level 1 Land Use in the Telegraph Swamp Planning Unit

Level 1	Type	Percentage of Planning Unit
1000	Urban and Built-up	0.3
2000	Agriculture (includes improved pasture)	22.2
3000	Rangeland	5.6
4000	Upland Forest	47.3
5000	Water (includes open bay)	0.1
6000	Wetlands	24.3
7000	Barren Land	0.1
8000	Transportation, Communications, and Utilities	0.1
Total		**100**

Table G.4: Level 1 Land Use in the Orange River Planning Unit

Level 1	Type	Percentage of Planning Unit
1000	Urban and Built-up	60.1
2000	Agriculture (includes improved pasture)	10.8
3000	Rangeland	4.1
4000	Upland Forest	9.6
5000	Water (includes open bay)	1.7
6000	Wetlands	8.9
7000	Barren Land	2.8
8000	Transportation, Communications, and Utilities	2.0
Total		**100**

Table G.5: Level 1 Land Use in the Caloosahatchee Estuary Planning Unit

Level 1	Type	Percentage of Planning Unit
1000	Urban and Built-Up	39.5
2000	Agriculture (includes improved pasture)	10.5
3000	Rangeland	5.2
4000	Upland Forest	16.6
5000	Water (includes open bay)	10.3
6000	Wetlands	13.1
7000	Barren Land	0.9
8000	Transportation, Communications, and Utilities	3.9
Total		**100**

Appendix H: Documentation Provided during Public Comment Period

Response to U.S. Environmental Protection Agency (EPA) Comments made August 12 and September 14, 2004, Caloosahatchee River

An electronic file of these comments was not received.

1) RE: WBIDs 3235B, 3235C, 3235D, 3235E, 3235F, 3235K, and 3235C.

Florida Department of Environmental Protection (FDEP) Response: According to the Impaired Surface Waters Rule (IWR), the state does not place waters on the Verified List for which a causative pollutant cannot be identified.

2) RE: WBIDs 3235B, 3235C, 3235D, 3235E, 3235F, 3235G, 3235J, 3235L, 3235M, 3237B, 3237D, and 3240I.

FDEP Response: The state will collect additional data in order to satisfy the IWR data sufficiency requirements. Given the required number of samples, and the short amount of time to collect them, the data will be collected over the next five years and the waters will be re-evaluated during the next phase of the Basin Rotation Schedule.

3) RE: WBIDs 3235B, 3235C, 3235D, 3235E, 3235F, 3235J, 3235L, 3237C, 3240E, and 3240H.

FDEP Response: The state will collect additional data in order to satisfy the IWR data sufficiency requirements over the next five years, and the waters will be re-evaluated during the next phase of the Basin Rotation Schedule.

4) RE: WBID 3235K.

FDEP Response: The listing for malathion has been changed to EPA Assessment Category 5, and the WBID is on the Verified List.*

5) RE: WBIDs ?

FDEP Response: The state will collect additional data in order to satisfy the 1998 303(d) listing and IWR data sufficiency requirements. Given the required number of samples, and the short amount of time to collect them, the data will be collected over the next five years and the waters will be re-evaluated during the next phase of the Basin Rotation Schedule.

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*As of June 2005 it has been determined that the malathion violations were actually non-detections posted as minimum detection limits and erroneously analyzed by the IWR database. Therefore we have removed malathion from the draft Verified List.

6) RE: WBIDs 3235A, 3235H, 3236A, 3240E, 3240F, 3240G, 3240H, 3240I, 3240J, 3240K, 3240M, and 3240N.

FDEP Response: The state will conduct an analysis similar to Subsections 62-302.800(1)(a)1.-3, Florida Administrative Code (F.A.C.), and will submit those justifications for categorizing the above WBIDs as Category 4c for EPA review.

7) RE: WBIDs 3235A, 3235H, 3236A, 3240E, 3240F, 3240G, 3240H, 3240I, 3240J, 3240K, 3240M, and 3240N.

FDEP Response: WBIDs 3240G, 3240I, and 3240J have been added to the Delist List.

* * * * * * * *

From: Michael Gookin (home) [mailto:gookin@earthlink.net]
Sent: Saturday, July 03, 2004 6:45 AM
To: Joyner, Daryll
Subject: fecal coliform in the Caloosahatchee River

It's quite obvious that the manatee population considerably contributes to the high levels of fecal coliform in the Caloosahatchee River. They also eat all the grass so the juvenile fish and crabs have no nursery. The loss of plant life also effects the oxygen levels. Force FP&L to cool the water they illegally discharge and you will have most of your problem solved.

Michael Gookin
3366 E Riverside Drive
Fort Myers, FL 33916
(239) 332- 4626

FDEP Response: FDEP acknowledges that the manatee population has several significant impacts in the ecosystem of the Caloosahatchee River. However, these impacts are considered to be naturally occurring, and intervention by FDEP is not required. The discharge water from the FP&L facility is regulated by a state permit that has considered the environmental impacts to the environment.

* * * * * * * *

Another public comment for the files.
Daryll

-----Original Message-----
From: Rikoshaprl@aol.com [mailto:Rikoshaprl@aol.com]
Sent: Thursday, July 08, 2004 8:00 PM
To: Joyner, Daryll
Subject: caloosahatchee river pollution

Dear Mr. Joyner,
It seems that the antiquated use of septic tanks in the area of the river and feeding waters, should be replaced with sewers so the waste can be treated.
Thanks,
Rick Cannon

* * * * * * * *

-----Original Message-----
From: Tony Pellicer [mailto:PELLICLA@leegov.com]
Sent: Friday, July 16, 2004 5:31 PM
To: Joyner, Daryll
Cc: Mandrup-Poulsen, Jan; Bickford, Karen; Roland Ottolini
Subject: Caloosahatchee IWL Comments

Daryll,

I am attaching the Lee County NPDES Annual Report Monitoring Summary submitted this past March. It alludes to the connection between releases from Lake Okeechobee and algal bloom in the Caloosahatchee and their associated tributaries. Although I did not plot other tributaries or WBIDs, there seems to be a strong correlation between the releases and algal blooms in the tribs and have been well documented in the lower Caloosahatchee.

The data plot is during a period of January 2001 thru September 2003. If this information may be of interest to the Department in the evaluation of suspected impairments, please let me know and I will forward the Excel spreadsheet for the specific sample site. I have not made a plot for other sample stations, but in looking over the data, there seems to be a similar correlation or cyclical pattern in the elevated concentrations of chl-a.

It would be unfortunate to list WBIDs as impaired if they are influenced by non-watershed activities which are out of local control.

Thanks for your time and with appreciation for all of your efforts,

Tony

FDEP Response: FDEP has reviewed the data provided by Lee County and agrees that a correlation exists between water releases from Lake Okeechobee and chlorophyll blooms in some waters within the Caloosahatchee Basin. However, at this time the FDEP has decided to include the impacted waters on the impaired list so that this problem can be acknowledged and addressed in the future.

* * * * * * * *

July 21, 2004

Comments from the Conservancy of Southwest Florida

No electronic file of the comments was provided.

FDEP Response: See below

* * * * * * * *

August 3, 2004

Comments from the Sierra Club

No electronic file of the comments was provided.

FDEP Response:

November 5, 2004

Karen Mulcahy, Conservation Organizer
Coastal Protection, Sierra Club
475 Central Avenue
Suite M-1
St. Petersburg, FL 33701

Dear Ms. Mulcahy:

Thank you for your August 3, 2004 letter providing comments on the draft list of impaired waters for the Caloosahatchee River Basin. We apologize for the delay in responding, but your letter raised several interesting and complex issues, and it has taken us considerable time to review and investigate them. Our goal was to ensure that we accessed as much information as possible on the issues that you raised. We appreciate you having taken the time to include the copies of selected materials with your letter. This certainly helped to increase our understanding of your concerns. Our responses to your comments are as follows:

1) Pesticides

We share your concerns about the potential direct or indirect impacts that pesticides may have on aquatic organisms and humans in the Caloosahatchee River and elsewhere in Florida. Much of the information you provided was tied to studies showing contamination of sediments. As you are aware, we largely base our assessment of the health of surface waterbodies using the water quality criteria contained in Chapter 62-302, Florida Administrative Code. Because we do not have any chemical-specific sediment criteria in our rules, we cannot use this information to directly list waters as impaired based solely on high sediment concentrations. However, we can use this type of information to place waters on our planning list to direct future studies designed to explore the impairment concerns.

As noted in your letter, malathion* is included as a pollutant on our current verified list of impaired waters (WBID 3235A). Your letter pointed us to an article published by the U. S. Geological Survey reporting on the findings of a survey conducted in the Caloosahatchee River and Estuary in 1998, which specifically identified high levels of chlordane in the bottom sediments. While we do not have a chlordane criterion in

*As of June 2005 it has been determined that the malathion violations were actually non-detections posted as minimum detection limits and erroneously analyzed by the IWR database. Therefore we have removed malathion from the draft Verified List.

sediments to assess against, we do have one for ambient waters. The criterion (< 0.00059 µg/L as an annual average and 0.0043 µg/L as a maximum value) is based on human health effects and is identically applied to all Class I, II, and III waterbodies. In response to your comments, we re-examined all available chlordane data in WBID 3235A. It is somewhat unusual that we have so many reported results for this substance. The monitoring was conducted by the South Florida Water Management District bi-monthly beginning in 1992 and running through March 2001, at a location identified as "S-79 Spillway & Lock." (It may be that the sampling has continued beyond that data, but no newer data have been provided.) Regardless, every sample tested was reported as "non-detect."

Your letter then requested that we investigate the recently compiled data from the Conservancy of Southwest Florida for "many other pesticides present in the portion of the Caloosahatchee River used for drinking water." As none of the chemicals you listed have numeric criteria in Chapter 62-302, F.A.C., we contacted our Biology Section and asked that they conduct a thorough review of the literature and databases known to them that might help us to assess the risk associated with these chemicals. We also reviewed the data that were known to us (in our database), with the primary data provider being the South Florida Water Management District. While we certainly agree that the chemicals you cited have the potential to have severe environmental impacts, most of the concentrations that were reported are either below the method detection limit (MDL) or below the practical quantitation limit (PQL) for the laboratory methods used. With the exception of some limited diazinon data, we were not able to find any data that exceeded the values provided by our Biology staff as indicating potential toxicity.

2) Carcinogens

You cited reports from the SFWMD indicating the presence of potential carcinogens (like DDT and PCBs) in the Caloosahatchee River basin. Page 3 of the report by Pfeuffer and Matson (May 2003) notes that "one DDD and four DDE compound sediment concentrations were of a magnitude considered to represent detrimental effects to sediment-dwelling organisms in freshwater sediments." However, the report goes on to say, "The above findings must be considered with the caveat that pesticide concentrations in surface water and sediment may vary significantly in relation to the timing and magnitude of pesticide application, rainfall events, pumping and other factors, and this was only one sampling event." In examining the rate of occurrence as reported by Pfeuffer and Matson, the exceedance rate at any one station is sporadic, and the compound of concern (i.e., those with levels above the threshold effects concentration or the probable effect concentration on sediment dwelling organisms) shifts from one compound to another, depending on the sampling event.

Please note that even if we were to assume that the sporadic detections constitute an impairment of aquatic life use support (and we acknowledge persistence of DDT and its breakdown products), we would still not list these waters as impaired by either DDT or

PCBs because these chemicals are no longer legally allowed to be used or discharged[3] [see Rule 62-304.470(2)]. This rule provision does not in any way mean to imply that these pollutants are not of concern, and instead simply recognizes that any TMDL would be zero for the pollutant and therefore does not need to be calculated.

3) Mercury

The pervasive presence of mercury in fish tissue is well documented, and there is no question that mercury can have serious health impacts on humans. In recognition of the situation, the Department continues to work closely with the Department of Health and the Florida Fish and Wildlife Conservation Commission to gather and assess the health of Florida's waterbodies with respect to mercury in the environment. The Department of Health is the lead agency for issuing fish consumption advisories and has done an excellent job of keeping the public informed on safe levels for fish consumption in Florida. However, the cycling of mercury in Florida's aquatic environment is still not well understood. Based on the expert testimony provided to the Department on that issue and with the concurrence of the EPA, the Department scheduled all the TMDLs for mercury in Florida's waters to be completed in 2011. The setting of a low priority was done in recognition of the complexity of mercury acting in the aquatic environment and the uncertainty surrounding the identification of sources (e.g., local, national, or global?), rather than a lack of concern on the part of the Department.

4) Nutrients

Finally, your letter expresses concern about possible limitations under the Impaired Waters Rule related to identifying nutrient impairment. While you are likely aware that the current proposed Verified List of waterbodies includes two estuarine segments (WBIDs 3240B and 3240C) of the Caloosahatchee that are impaired for nutrients and dissolved oxygen, we would like to note that the TMDL for those segments will require the Department to examine all upstream segments of the river to identify and limit the sources causing those impairments. That is, just because a particular segment is not listed, does not mean a TMDL will not require load reductions of contributing sources in those other areas. Furthermore, we can and do consider added data (like those you mentioned regarding toxic algae) and can use this "other information" as a basis for listing additional waters [see 62-303.350(1) and 62-303.450(2), F.A.W.].

We greatly appreciate the time and resources you've devoted to reviewing the Department's draft verified list of impaired waters for the Group 3 Caloosahatchee Basin. Comments and supporting materials were very informative and helpful to the decision-making process. We look forward to continuing to work with you and your membership in implementing the clean-up efforts needed, part of which will occur under the Total Maximum Daily Load Program. Please feel free to call me at 850/245-8431 if you have any further questions or comments regarding this response.

---

[3]The use of DDT has been banned in the United States since 1973, and EPA restricted most uses of PCBs beginning in 1978.

Sincerely,

Daryll Joyner, Program Administrator

* * * * * * * *

August 9, 2004

Daryll Joyner, Program Administrator
Total Maximum Daily Load Program
Florida Department of Environmental Protection
Mail Station 3510
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Karen Bickford
Florida Department of Environmental Protection
P.O. Box 2549
Ft. Myers, Florida 33902

Via e-mail and U.S. Mail

Re: Caloosahatchee River Draft Master List of Impaired Waters

Dear Mr. Joyner and Ms. Bickford:

The Conservancy of Southwest Florida (Conservancy) appreciates the opportunity to comment on the 2004 draft verified list of impaired waters for the Caloosahatchee Basin. These comments supplement those that we submitted concerning pesticide contamination by letter of July 21, 2004.

1. The State Must List All Impaired or Threatened Waters.

The Federal Clean Water Act (CWA) Section 303, 33 U.S.C. § 1313, requires each state to "identify those waters within its boundaries for which the [technology-based or other existing] effluent limitations are not stringent enough to implement any water quality standard [WQS] applicable to such waters." 33 U.S.C. § 1313(d)(1)(A). United States Environmental Protection Agency ("EPA") regulations and guidance clarify that states must identify all segments of water bodies which do not or may not within the next two years meet numeric water quality criteria, narrative criteria, waterbody designated or

existing uses or anti-degradation requirements. 40 C.F.R. § 130.7(b)(3), (5); *See also* Guidance for 2004 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d) and 305(b) of the Clean Water Act. Diane Regas, Director, Office of Wetlands, Oceans, and Watersheds, U.S. EPA (July 21, 2003) ("Guidance for 2004").

Thus, it is unacceptable for the state not to list, for example, threatened waters or waters that have been identified as impaired by data other than chemical water quality samples indicating exceedences of numerical standards. Similarly, the state must list those water bodies which can reasonably be expected to fail to meet WQS in the future due to, for example, a planned housing or industrial development. This was emphasized in EPA's Guidance for 2004 at pages 11 and 23:

> Yes, States should include threatened waters in Category 5. Threatened waters are waters that are currently attaining WQSs, but which are expected to exceed WQSs by the next listing cycle (every two years). Waters should be listed if the analysis demonstrates a declining trend in a specific water quality criterion (WQC), and the projected trend will result in a failure to meet a criterion by the date of the next list (i.e., 2006 for purposes of the 2004 assessment cycle). The State assessment and listing methodology should describe how the State identifies threatened waters.
>
> * * *
>
> EPA believes that a valid assessment of a water's condition should involve drawing broader conclusions than those that can be drawn from direct observations (monitoring data, visual surveys, etc.) only. Simple dilution calculations, for example, can be used to estimate what concentration of a pollutant might be present under conditions (e.g., streamflow, pollutant loads) different from those extant at the time sampling was performed.

The Clean Water Act and EPA regulations do not provide for a bifurcated 303(d) list, as is contained in the draft for the Caloosahatchee Basin, with a "verified list" of waters for which TMDL's will be developed and a "planning list" of waters that do not meet water quality standards or support uses but that will not be the subject of TMDL development because the water quality data do not meet strict data requirements. Section 303(d) of the Clean Water Act, 33 U.S.C. § 1313(d), and 40 C.F.R. § 130.7, clearly anticipate that each state should submit one list of waters for which TMDL's are still needed based upon "all existing and readily available water quality-related data and information." While EPA has provided for an "Integrated Report" with five categories in which to place waters based on the water quality evaluation, the DEP Planning List waters would fit into Category 5 with Verified List waters.

2. The State Must Use All Existing Data and Actively Solicit Additional Data.

In developing its list of all threatened or impaired waters, the State must use "all existing and readily available water quality-related data and information." 40 C.F.R. §130.7(b)(5). These data include, at a minimum, waters identified in the most recent state section 305(b) report as "partially meeting" or "not meeting" designated uses or as "threatened;" waters calculated by models not to meet water quality standards; or waters "for which water quality problems [including fishing, shellfishing, or recreational restrictions] have been reported" by local, federal or state agencies, members of the public or academic institutions. 40 C.F.R. § 130.10(d)(6). EPA's Guidance for 2004 at page 20 emphasizes the inclusiveness of the data to be considered:

> States should consider data and information from the sources listed below for the 2004 Integrated Report:
>
> - reports prepared in 2002 to satisfy CWA Sections 305(b), 303(d) and 314 and any updates
> - the most recent Section 319(a) nonpoint source assessment
> - reports of ambient water quality data including State ambient water quality monitoring programs, complaint investigations, etc., from the public and other readily available data sources (e.g., STORET, USGS, research reports, etc.), and data and information provided in public comments
> - reports of dilution calculations or predictive models
> - water quality management plans
> - Superfund Records of Decision
> - SDWA source water assessments
>
> In addition to these conventional sources of data and information EPA strongly encourages States to solicit compile and consider data and information from volunteer monitoring networks.
>
> The State should also make reasonable efforts to obtain and consult sources of data and information referenced in public comments, but not provided by commenters.

This inclusive list of sources of information means that the State may not exclude information because of arbitrary limitations on what it considers acceptable data. For example, the EPA recently reviewed the DEP Group 1 Basin submission and concluded that "FDEP should work towards amending its process to include a method for identifying water quality limited segments when provided with clear evidence of impairment within small data sets." Decision Document Regarding Department Of Environmental Protection's §303(D) List Amendment Submitted On October 1, 2002 And Subsequently Amended On May 12, 2003 (EPA Region IV, Water Management Division, June 11, 2003). EPA's Guidance for 2004 at pages 25 to 26 amplifies this point:

> EPA does not recommend the use of rigid, across the board, minimum sample size requirements in the assessment process. Target sample sizes should not be applied in an assessment methodology as absolute exclusionary rules. . . Still, the methodology should provide decision rules for concluding nonattainment even in cases where the target data quantity expectations are not met, but the available data and information indicate a reasonable likelihood of a WQC exceedance (e.g., available samples with major digressions from the criterion concentration, corroborating evidence from independent lines of evidence such as biosurveys). . . Even a very small set of samples may be sufficient to indicate impairment, particularly when the duration/averaging periods of relevant WQC are quite short (an hour or less).

The EPA Guidance for 2004 also emphasizes that data should not be arbitrarily excluded based on age, as DEP does using the Impaired Waters Rule. Nor should the source of the data should be restricted to DEP's version of STORET.

Moreover, the state must actively solicit such information from other agencies, the public, and all possible sources. 40 C.F.R. § 130.7(b)(5)(iii). The U.S. Army Corps of Engineers, Jacksonville District, recently completed a comprehensive evaluation of water quality in Southwest Florida, including the Caloosahatchee Basin, as part of the Southwest Florida Feasibility Study. *See* Compilation, Evaluation, and Archiving of Existing Water Quality Data for Southwest Florida (in support of the Southwest Florida Feasibility Study) Final Report Prepared by Tetra Tech, Inc Janicki Environmental, Inc. (May 5, 2004). DEP should utilize this evaluation in its review of the Caloosahatchee Basin.

3. It is Improper to Exclude Waterbodies That Do Not Meet Water Quality Standards From the Verified List Because the Causative Pollutant Has Not Been Determined.

EPA's Guidance for 2004 at page 11 questions the approach used by DEP to only place waters on the Planning List where there is impairment, but the causative pollutant has not been identified.

> States are required to identify the pollutant causing the impairment or threat for each water/pollutant combination in Category 5 (40 CFR 130.7(d)). States should include impaired and threatened waters in Category 5 when a water is shown to be impaired or threatened in relation to biological assessments used to evaluate aquatic life uses or narrative or numeric criteria adopted to protect those uses even if the specific pollutant is not known. These waters should be listed unless the State can demonstrate that nonpollutant stressors cause the impairment, or that no

pollutant(s) causes or contribute to the impairment. Prior to establishing a TMDL for such waters, the pollutant causing the impairment would need to be identified.

EPA's review of the Group 1 Basins also questioned the DEP practice.

4. The Agency Should Post Its Data On The Internet For Access By All Interested Parties.

The Conservancy requested and received data used by DEP to establish its current draft verified list a short time before the public meeting. Had this information been posted on-line, review of the data, and DEP's analysis thereof would have been accelerated and enabled the Conservancy to better participate in the public meeting held shortly after the release of the report. We believe that we are not the only reviewers that would have benefited from more accessibility to the data.

With the increase in use of the internet and the State of Florida's initiative to make information readily available to citizens, the Conservancy urges DEP to establish a website or FTP site to house the data used in developing the draft verified lists for the impaired waters rule. The URL can then be published so that interested parties have early and unlimited access to the data.

5. There is No Indication That the Statutorily Required Protections for Outstanding Florida Waters Were Considered in Developing the Impaired Waters List.

Section 62-302.700 FAC provides special protections for Outstanding Florida Waters and Outstanding National Resource Waters. The Section states that: "No degradation of water quality, other than that allowed in Rule 62-4.242(2) and (3), F.A.C., is to be permitted in Outstanding Florida Waters and Outstanding National Resource Waters, respectively, notwithstanding any other Department rules that allow water quality lowering."

The Caloosahatchee Basin contains OFW, including the Caloosahatchee National Wildlife Refuge. The Conservancy believes that the designation of waters as Outstanding Florida Waters, together with the "no degradation" criteria, provides a water quality standard that should be included in the evaluation of waters for the DEP 303(d) list. It would consistent with the data framework of Chapter 62-303, F.A.C., to assess Outstanding Florida Waters using this "no degradation" criteria. Such an assessment would require data on the water quality at the time the waters were designated as Outstanding Florida Waters, and monitoring results would be compared to these "baseline" data to determine whether there has been degradation. Even if the assessment of Outstanding Florida Waters for degradation does not fit within the framework of Chapter 62-303, as discussed above, DEP would be required to include these waters on the 303(d) list if they exhibit degradation, pursuant to 40 C.F.R. § 130.7(b)(3).

6. DEP Should Evaluate the Caloosahatchee River for Flow-Related Pollution

The Caloosahatchee River and Estuary are significantly impacted by the lack of freshwater flows from Lake Okeechobee during the dry season and too much freshwater during the wet season. For example, the South Florida Water Management District has set a Minimum Flow for the Caloosahatchee, but this standard has been violated in two out of the three years since its adoption. EPA's Guidance for 2004 at page 8 states that "[l]ow flow can be a man-induced condition of a water (i.e., a reduced volume of water) which fits the definition of pollution." Therefore, the flow-related impacts for the Caloosahatchee should be included in the impaired waters evaluation. EPA also points out that "[l]ack of flow sometimes leads to the increase of the concentration of a pollutant (e.g., sediment) in a water." The flow regime should be taken into account in the development of TMDLs for the Caloosahatchee for those parameters with exceedences primarily during the dry season.

Please call me at 239-403-4222 or e-mail me (garyd@conservancy.org) if you have any questions about these comments. We look forward to receiving the revised list for the Caloosahatchee Basin.

Sincerely,

Gary A. Davis, Director,
Environmental Policy

* * * * * * * *

CONSERVANCY
Of Southwest Florida
1450 Merrihue Drive•Naples, FL 34102
239.403.4213•Fax 239.262.0672
www.conservancy.org

October 29, 2004

Daryll Joyner, Program Administrator
Total Maximum Daily Load Program
Florida Department of Environmental Protection
Mail Station 3510
2600 Blairstone Road
Tallahassee, Florida 32399-2400

Karen Bickford
Florida Department of Environmental Protection
P.O. Box 2549
Ft. Myers, Florida 33902

Re: Verified Impaired Waters List for the Caloosahatchee River For The Group 3 Draft Master List of Impaired Waters

Dear Mr. Joyner and Ms. Bickford:

The Conservancy of Southwest Florida (Conservancy) appreciates the opportunity to comment on the revised 2004 draft verified list of impaired waters for the Caloosahatchee Basin. We have previously submitted two letters concerning the draft list, and we request that these be considered in the final adoption. We want to reemphasize with this letter the pesticide contamination problem in the River. In addition, we would like to understand why the C-21 basin (WBID 3246) was removed from the draft Verified List for low dissolved oxygen and whether this water body been adequately evaluated for nutrient loadings to the Caloosahatchee.

Pesticide Contamination and Exceedences of Toxicity Standards

We are very concerned that the revised draft Impaired Waters List for the Caloosahatchee Basin does not address the serious pesticide contamination in the River, particularly in the portion of the River used for drinking water supply by Lee County Utilities. The data that we provided from the South Florida Water Management District ("SFWMD"), in addition to data that DEP already had in its database, clearly show that there are exceedances of the toxicity standard, yet DEP did not include these impairments on the revised Verified List.

Our previous comments provided data on pesticide contamination that were not in the DEP database. These data are from samples collected by SFWMD and analyzed in DEP's own laboratory. Since our letter, there has been an additional set of data posted on the SFWMD website for October 2003 samples [www.sfwmd.gov/curre/pest/pestindex.htm]. These data show continued pesticide contamination in the water column.

As we pointed out, there are several pesticides in addition to malathion* found in significant levels in the Caloosahatchee including the water body used for drinking water (WBID 3235A). These include the possible human carcinogens atrazine, bromacil, metolachlor, norflurazon and simazine, as well as pesticides highly toxic to fish, diazinon and ethoprop. Many of the pesticides detected do not have compound-specific numeric water quality criteria, but as discussed below, some of them are present at levels that are considered chronically toxic under Florida Water Quality Standards.

The Florida Surface Water Quality Standards define acute toxicity as "the presence of one or more substances . . .which are greater than one-third (1/3) of the amount lethal to 50% of the test organisms in 96 hours (96 hr LC_{50}) where the 96 hr LC_{50} is the lowest value which has been determined for a species significant to the indigenous aquatic community." § 62-302.200(1) F.A.C. Chronic Toxicity is defined as "the presence of one or more substances . . . in amounts which are greater that one-twentieth (1/20) of the amount lethal to 50% of the test organisms in 96 hrs (96 hr LC_{50}) where the 96 hr LC_{50} is the lowest value which has been determined for a species significant to the indigenous aquatic community." § 62-302.200(4) F.A.C. We may have mislabeled these standards as "narrative" in our previous letter, because they do not contain concentration criteria for specific chemicals. In fact, they represent numeric standards, because the 96 hr LC_{50} values can be determined from reported toxicological testing, and the water quality data can be compared to these values. There is no interpretation involved.

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*As of June 2005 it has been determined that the malathion violations were actually non-detections posted as minimum detection limits and erroneously analyzed by the IWR database. Therefore we have removed malathion from the draft Verified List.

We reiterate that available pesticide monitoring data for the Caloosahatchee indicate that two pesticides have been present in levels that exceed water quality standards for chronic toxicity to aquatic organisms: Ethoprop and Diazinon. As we are sure you appreciate, it is rare and alarming to find levels of any toxic chemical in a water body that approach 96 hr LC_{50} values. Aquatic toxicity testing is usually performed on effluent to ensure that receiving waters will not be impacted by toxic chemical discharges.

Reported 96 hr LC_{50} values for Ethoprop in the Hazardous Substances Data Bank ("HSDB") include the following:

mysid	20	micrograms per liter (µg/L)
spot	33	(µg/L
pinfish	6.3	(µg/L
bluegill	300	(µg/L

Using the value for pinfish, which is the lowest value determined for a species significant to the indigenous aquatic community in the Caloosahatchee, 1/3 of the LC_{50} is 2.1 (µg/L, and 1/20 of the LC_{50} is 0.315 (µg/L. A sample collected on 12/14/98 for WBID 3235A indicates the presence of Ethoprop at 0.32 (µg/L, which would exceed the chronic toxicity standard. Ethoprop is a pesticide used only on sugar cane, and is also the most hazardous of all sugarcane pesticides.

Reported 96-hour LC_{50} values for Diazinon in the Hazardous Substances Data Bank ("HSDB") include:

daphnia	0.90	micrograms per liter (µg/L)
water flea	1.4	µg/L

Using the daphnia value, 1/3 of the 96-hour LC_{50} is 0.30 µg/L, and 1/20 is 0.046 µg/L. Samples collected for WBIDs 3235A and 3235B indicate the presence of Diazinon at levels that are chronically toxic for daphnia. Five samples collected in these WBIDs on 6/27/2000, 1/7/2003, and 3/10/2003 are at levels that are chronically toxic for daphnia (above 0.046 µg/L).

We have noted in reviewing toxicological data for pesticides found in the Caloosahatchee that one pesticide, norflurazon, has no LC_{50} values reported in the literature. DEP should consider requesting LC_{50} values from the manufacturer or commissioning a 96-hour LC_{50} test for this compound.

In addition to these compounds that are toxic to aquatic organisms, we are concerned that there should be an evaluation of the five possible human carcinogens under the narrative standard in 62-302.530(62) F.A.C., which states "substances in concentrations which injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, plants or animals" should not be present. If DEP did not evaluate the

pesticides under narrative standards, how were they or how will they be evaluated? In addition, did DEP evaluate the pesticides for Toxicity Data? If so, how?

C-21 (S-4) Basin
We are puzzled that the C-21 Basin (sometimes called the S-4 Basin) designated as WBID 3246 was removed from the draft Verified List for dissolved oxygen (with nutrients as the causative pollutant). We would like to know the rationale for this.

We are also puzzled that the WBID is not considered impaired for nutrients. This is of concern because the S-4 Basin has very intensive agricultural land use. Much of the runoff from this Basin is diverted into the C-43 or Caloosahatchee River.

A review of phosphorus loading from the S-4 Basin indicates that it is a significant contributor of this pollutant. Compared to the East Caloosahatchee Basin (200,993 acres), the S-4 Basin is significantly smaller in area (39,673 acres) but has 687 times more phosphorus runoff (Lake Okeechobee Protection Plan, August 2003, SFWMD, FDEP, FDACS). The S-4 Basin reputedly does not contribute runoff to the Caloosahatchee River when the Lake Stage is below the Lake Regulation Schedule. However, the Lake frequently exceeds the 15.5 foot stage level (or above regulation schedule) where discharge to the Caloosahatchee River can and does occur.

Any meaningful attempts to remedy nutrient pollution in the Caloosahatchee River and associated estuary through TMDL development cannot realistically occur if runoff from the S-4 Basin is not considered. We strongly urge you and your staff to consider working with the SFWMD to further review water quality data in the S-4 Basin for potential inclusion of these data and conditions (e.g. imbalance of flora and fauna, exotic weed proliferation and control etc.) that may lead to verified impairments within the Basin and ultimately to the Caloosahatchee River and Estuary.

Should you have any questions regarding this information, please feel free to call me at (239) 403-4222.

Sincerely,

Gary A. Davis, Director
Environmental Policy

FDEP Response to the Conservancy of Southwest Florida's July 21st, August 9th, and October 29th, 2004 comments:

November 9, 2004

Gary A. Davis, Director
Conservancy of Southwest Florida
1450 Merrihue Drive
Naples, FL 34102

Dear Mr. Davis:

Thank you for your July 21st, August 9th, and October 29th, 2004 letters providing comments on the draft list of impaired waters for the Caloosahatchee River Basin. We apologize for the delay in responding, but your letter raised several interesting and complex issues, and it has taken us considerable time to review and investigate them. Our goal was to ensure that we accessed as much information as possible on the issues that you raised. Our responses to your comments are as follows:

1) Pesticides

We share your concerns about the potential direct or indirect impacts that pesticides may have on aquatic organisms and humans in the Caloosahatchee River and elsewhere in Florida.

As noted in your letter, malathion* is included as a pollutant on our current Verified List of impaired waters (WBID 3235A). The Department appreciates the Conservancy's comments regarding pesticides in the Caloosahatchee Basin, and the additional data that the Conservancy provided. The Department has contacted the South Florida Water Management District regarding why their data from May 2001 through March 2003 was not inputted into the STORET database. Additionally the Department has evaluated the Pesticide Surface Water Reports dated May 2001, August 2001, December 2001, February 2002, June 2002, September 2002, November 2002, and March 2002, which the Conservancy provided. Your letter then requested that we investigate other pesticides (atrizine, bromacil, metolachlor, norflurazon, simazine, diazinon, and ethoprop) present in the portion of the Caloosahatchee River used for drinking water. As none of the

*As of June 2005 it has been determined that the malathion violations were actually non-detections posted as minimum detection limits and erroneously analyzed by the IWR database. Therefore we have removed malathion from the draft Verified List.

chemicals you listed have numeric criteria in Chapter 62-302, F.A.C., we contacted our Biology Section and asked that they conduct a thorough review of the literature and databases known to them that might help us to assess the risk associated with these chemicals. We also reviewed the data that were known to us (in our database), with the primary data provider being the South Florida Water Management District. While we certainly agree that the chemicals you cited have the potential to have severe environmental impacts, most of the concentrations that were reported are either below the method detection limit (MDL) or below the practical quantitation limit (PQL) for the laboratory methods used. With the exception of some limited diazinon data, we were not able to find any data that exceeded the values provided by our Biology staff as indicating potential toxicity. However, we have used this information to place these waters on our planning list to direct future studies designed to explore the impairment concerns.

2) C-21 (S-4) Basin

Your letter expresses concern about possible limitations under the Impaired Waters Rule related to identifying nutrient impairment. While you are likely aware that the current proposed Verified List of waterbodies includes two estuarine segments (WBIDs 3240B and 3240C) of the Caloosahatchee that are impaired for nutrients and dissolved oxygen, we would like to note that the TMDL for those segments will require the Department to examine all upstream segments of the river to identify and limit the sources causing those impairments. That is, just because a particular segment is not listed, does not mean a TMDL will not require load reductions of contributing sources in those other areas. Furthermore, we can and do consider additional data and can use this "other information" as a basis for listing waters [see 62-303.350(1) and 62-303.450(2), F.A.W.].

3) The State Must List All Impaired or Threatened Waters.

The FDEP strives to incorporate all of the available data for inclusion in the STORET database for analysis under the Impaired Waters Rule (IWR). The FDEP does list all of the waters that are impaired or threatened on the Master List.

4) The State Must Use All Existing Data and Actively Solicit Additional Data.

The FDEP uses all data that is made available to the department and can demonstrate that it is from a reliable source and adequate QA/QC collection methods were used.

5) It is Improper to Exclude Waterbodies That Do Not Meet Water Quality Standards From the Verified List Because the Causative Pollutant Has Not Been Determined.

According to Florida Statute 62-303.710 (The verified list shall specify the pollutant or pollutants causing the impairment and the concentration of the pollutant(s) causing the impairment.).

6) The Agency Should Post Its Data On The Internet For Access By All Interested Parties

The FDEP does post the Master, Verified, and Delisted lists on the internet as soon as they become available. The posting of the IWR Run used to generate these lists is currently beyond the technical ability of the department due to the size of the database and program. The department does send out CD's with the data and program upon request.

7) There is No Indication That the Statutorily Required Protections for Outstanding Florida Waters Were Considered in Developing the Impaired Waters List.

The FDEP does take into consideration Section 62-302.700 FAC, Outstanding Florida Waters, Outstanding National Resource Waters when compiling the Master list. Where applicable the department utilizes historical data to assist in determining background levels for pollutants.

8) DEP Should Evaluate the Caloosahatchee River for Flow-Related Pollution

The FDEP acknowledges that there is a relationship between flow and pollution levels. The FDEP will evaluate the relationship between flow and pollution levels during development and implementation of the TMDL.

We greatly appreciate the time and resources you've devoted to reviewing the Department's draft verified list of impaired waters for the Group 3 Caloosahatchee Basin. Comments and supporting materials were very informative and helpful to the decision-making process. We look forward to continuing to work with you and your membership in implementing the clean-up efforts needed, part of which will occur under the Total Maximum Daily Load Program. Please feel free to call me at 850/245-8431 if you have any further questions or comments regarding this response.

Sincerely,
Daryll Joyner, Program Administrator

* * * * * * * *

DEAR MR. DARYLL JOINER:

POLUTTING THE CALOOSAHATCHEE RIVER:

THE CATTLE, SUGAR CANE AND ORANGE GROVE FARMERS SOUTH OF MOORE HAVEN, FL. ARE REALLY THE BIG POLLUTERS OF LAKE HICPOCHEE. THEY'RE PUMPING SO MUCH FERTILIZERS AND POLLUTANTS INTO THE LAKE, THE DUCKS, COOTS, AND FISH HAVE LEFT.

THE STATE HAS DREDGED LAKE TRAFFORD, WHENEVER THE FISHERMEN COMPLAIN. WHY HAVEN'T THEY DREDGED THE POLLUTENTS OUT OF HICPOCHEE? I THOUGHT THE STATE DECIDED TO RESTORE LAKE HICPOCHEE, WHERE THE WATER LEVELS WILL BE MANAGED TO REFLECT A MORE NATURAL SHEET FLOW. ALSO, HICPOCHEE WILL NOT BE A SOURCE OF WATER FOR AGRICULTURAL USERS OR WATER STORAGE.

THE FARMERS MUST MAKE THEIR OWN AREAS FOR WATER STORAGE AND DUMPING WATER, AFTER A HEAVY RAIN. IF THE STATE HAS DECIDED TO RESTORE LAKE HICPOCHEE WHY AREN"T THEY DOING IT?

ALL THE DRAINAGE PIPES THAT FLOW INTO THE CALOOSAHATCHEE FROM THE MOORE HAVEN LOCKS, TO FT. MYERS, HAVE NUMBERS ON THEM. ALL THOSE PIPES SHOULD BE CHEKED FOR POLLUTENTS. I HAVE NEVER SEEN ANYONE DOING THIS.

MR. J.B. NOAH
4200 GLASGOW CT.
N. FT. MYERS, FL. 33903

PHONE:
1-863-946-0739
1-239-995-1357

J.B. Noah III

-----Original Message-----
From: Lasharonna@aol.com [mailto:Lasharonna@aol.com]
Sent: Wednesday, October 20, 2004 8:19 PM

To: Joyner, Daryll
Subject: Impaired waters list-yellow fever creek-north fort myers

Dear Mr. Joyner:
We bought a home in May on this creek, and I was alarmed to see that it might come off the list. If the reason is a lack of data, I could help you gather it. My neighbors are also interested in helping. I know that there are people in county government who are trying to get it cleaned up from the hurricane debris. Right now it is almost stillwater because of all the tree branches, trunks, etc in it. Please let me know if there is anything I can do.
Cordially,

Sharon Zahav

Dear Ms. Zahav;

I apologize for the delay in the Department's reply to your letter of October 20, 2004. However the Department was in the midst of adding additional data to the IWR database and I had wanted to wait until that process was complete in order to give a more accurate response to your letter.

Based on the most current data available to the Department (IWR Run 18.1) Yellow Fever Creek (WBID 3240E) appears to meet the water quality standards of its use requirements for all of the parameters tested except dissolved oxygen. Currently there is insufficient data to assess malathion and fluoride; however, the Department has plans to collect the necessary samples to adequately evaluate these parameters. Based on the current nutrient and biological data for Yellow Fever Creek the Department believes that the low level of dissolved oxygen is due to naturally occurring conditions.

Thank you for your offer to assist in collecting data; however, at this time the Department has plans to continue sampling and assessing Yellow Fever Creek over the next five years. Your comments are very much appreciated as input from the people actually living in the basins the Department is assessing are always useful.

If you have any further questions or comments please feel free to contact me at (850) 245-8458 or by e-mail at robert.perlowski@dep.state.fl.us.

Sincerely

Robert Perlowski
Environmental Specialist II
Watershed Assessment Section

* * * * * * * *

Watershed Council
Southwest Florida Watershed Council, Inc.
P.O. Box 61063, Fort Myers, FL 33906-1063
www.swfwc.org

October 21, 2004

Mr. Daryll Joyner, Program Administrator
Total Maximum Daily Load Program
Florida Department of Environmental Protection
Mail Station 3510
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Joyner:

I am writing to provide public comment on behalf of the Southwest Florida Watershed Council regarding the Group 3 Basin, Caloosahatchee River Draft Verified list of Impaired Waters.

As of this date there appear to be no verified impairments for the S-4 Basin. This is of concern because the S-4 Basin has very intensive agricultural land use. Apparently, previous attempts to divert water from the S-4 Basin to Lake Okeechobee have resulted in litigation due to the polluted condition of runoff from this basin. Much of this runoff now is diverted into the C-43 or Caloosahatchee River from the C-21 Canal and S-235.

A review of phosphorus loading from the S-4 Basin indicates that it is a significant contributor of this pollutant. Compared to the East Caloosahatchee Basin (200,993 acres), the S-4 Basin is significantly smaller in area (39,673 acres) but has 687 times more phosphorus runoff (Lake Okeechobee Protection Plan, August 2003, SFWMD, FDEP, FDACS). The S-4 Basin reputedly does not contribute runoff to the Caloosahatchee River when the Lake Stage is below the Lake Regulation Schedule. However, the Lake frequently exceeds the 15.5 foot stage level (or above regulation schedule) where discharge to the Caloosahatchee River can and does occur.

Any meaningful attempts to remedy nutrient pollution in the Caloosahatchee River and associated estuary through TMDL development cannot realistically occur if runoff from the S-4 Basin is not considered. We strongly urge you and your staff to consider working with the SFWMD to further review water quality data in the S-4 Basin for potential inclusion of these data and conditions (e.g. imbalance of flora and fauna, exotic weed

proliferation and control etc.) that may lead to verified impairments within the Basin and ultimately to the Caloosahatchee River and Estuary.

We are also concerned about issues related to pesticides in the Caloosahatchee River, including pesticides that are impacting water quality in Class I waters used for drinking water. We understand that The Conservancy of Southwest Florida reviewed the data pertaining to pesticides used to create the draft verified list. Like The Conservancy, we have questions about how the pesticide data were evaluated under the Impaired Waters Rule and the Florida Water Quality Standards and we are concerned that the data set did not include all the available data regarding pesticides in the Caloosahatchee. Although the draft verified list for the Caloosahatchee lists the segment of the river used for drinking water as impaired for malathion*, the data relied on by DEP and the additional data identified by the Conservancy indicate that several other pesticides are present in the Caloosahatchee, including the portion of the river used for drinking water (Water Body Identification Number (WBID) 3235A). These include the possible human carcinogens atrazine, bromacil, metolachlor, norflurazon and simazine, as well as pesticides highly toxic to fish, diazinon and ethoprop. Many of the pesticides detected do not have numeric water quality criteria, but as discussed below, some of them are present at levels that are considered chronically toxic under Florida Water Quality Standards. For all of those that do not have numeric water quality criteria, their presence in significant levels in waters used for drinking water should be evaluated under the narrative standard of 62-302.530(62) F.A.C.

Available pesticide monitoring data for the Caloosahatchee indicate that two pesticides were present in levels that exceed the narrative water quality standards for acute or chronic toxicity to aquatic organisms: Ethoprop and Diazinon. In addition to these compounds that are toxic to aquatic organisms, we believe there should be an evaluation of the five possible human carcinogens under the narrative standard in 62-302.530(62) F.A.C., which states “substances in concentrations which injure, are chronically toxic to, or produce adverse physiological or behavioral response in humans, plants or animals” should not be present. If DEP did not evaluate the pesticides under narrative standards, how were they or how will they be evaluated? In addition, did DEP evaluate the pesticides for Toxicity Data? If so, how?

To summarize our concerns and questions, we ask that you work with the South Florida Water Management District to further review water quality data and runoff issues in the

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*As of June 2005 it has been determined that the malathion violations were actually non-detections posted as minimum detection limits and erroneously analyzed by the IWR database. Therefore we have removed malathion from the draft Verified List.

S-4 Basin and that you share with us information about how pesticide data was evaluated under the Impaired Waters Rule, Florida Water Quality Standards and the Florida Administrative Code. Thank you for your attention to the concerns we are raising. We look forward to hearing from you.

Sincerely,

Susan Brookman
Susan Brookman
Chairman

Copies: Ms. Karen Bickford, Florida Department of Environmental Protection
Mr. Pat Fricano, Florida Department of Environmental Protection
Mr. John Albion, Lee Board of County Commissioners
Mr. Robert Giesler, Glades Board of County Commissioners
Mr. W.T. 'Bill' Maddox, Jr., Hendry Board of County Commissioners
Mr. Bob Howard, South Florida Water Management District
Mr. Gary Davis, Conservancy of Southwest Florida

FDEP Response:

- All waters of the state are evaluated using the IWR to determine if they are impaired. The waters in the S-4 basin were evaluated using this criterion, and there is not sufficient data to support their addition to the Verified List at this time. The waters will continue to be tested and re-evaluated during the next scheduled basin rotation.
- Agricultural operations can be significant sources of nutrients in aquatic systems. It is expected that agricultural best management practices (BMPs) will significantly reduce the amount of nutrients entering into the Caloosahatchee Basin. FDEP will continue to evaluate the waters in the S-4 basin.
- FDEP considers all possible sources of nutrient impairment within a waterbody when developing a TMDL. FDEP makes every attempt to work with all organizations to gather and review water quality data. FDEP relies on the judgment of the District offices and Water Management Districts to review data with regards to imbalances in the natural flora and fauna.
- Currently there are no numerical Florida Water Quality Standards for evaluating most of the pesticides that were found in the Caloosahatchee Basin. Those pesticides for which numerical water standard criteria do exist were added individually to the Master List. Those pesticides for which no numerical water standard criteria exist were added as a group to the Master List. It is hoped that by recognizing these pesticides and adding them to the Master List, more data will be collected for adequate evaluation. Unless a numerical criterion for each of these pesticides is developed, they will be evaluated using the narrative standard in Subsection 62-302.530(62), F.A.C.

Florida Department of Environmental Protection
Division of Water Resource Management
Bureau of Watershed Management
2600 Blair Stone Road, Mail Station 3565
Tallahassee, Florida 32399-2400
(850) 245-8561
www.dep.state.fl.us/water