

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Water Resource Management

CENTRAL DISTRICT • GROUP 2 BASIN • MARCH 2003

Basin Status Report



Middle St. Johns





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Middle St. Johns





Acknowledgments

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Preface

Content Features

- **Executive Summary:** Appears at the beginning of every report and provides an overarching view of the watershed management approach, its implementation, and how this approach will be used to identify impaired waters.
- **Chapter Summary:** Appears at the beginning of every chapter and provides an overview of the chapter.
- **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 at the side of pages 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 within the text.
- **Appendices:** Appear at the end of each report and provide additional information on 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

Middle St. Johns

The *Middle St. Johns Basin Status Report* is part of the first phase of implementation of the Florida Department of Environmental Protection's (Department) watershed approach for restoring and protecting water resources and addressing total maximum daily load (TMDL) program requirements. The watershed approach provides a framework for implementing the requirements of the 1999 Florida Watershed Restoration Act and Section 303(d) of the federal Clean Water Act.

The report provides a preliminary evaluation of the status of water quality and associated ecological health in the Middle St. Johns Basin. It identifies potential water quality impairments and water quality monitoring needs, and provides a summary of plans and projects that are under way or projected to improve water quality (see **Noteworthy** for a description of the contents of this report).

Through its watershed management activities, the Department works with regional and local interests to support programs that are improving water quality and restoring and protecting ecological resources. In the Middle St. Johns Basin, state, federal, regional, and local agencies and organizations are making significant progress towards identifying problems and improving water quality. These include the St. Johns River Water Management District, Seminole County, Volusia County, Orange County, Lake County, and the Lake County Water Authority.

Total Maximum Daily Loads

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. During the next few years, considerable data collection and analysis will be done to establish TMDLs for impaired waters in the Middle St. Johns Basin. A watershed management plan to reduce the amount of pollutants that cause impairments will also be produced.

These activities will depend heavily on the active participation of the water management district, local governments, businesses, and other watershed stakeholders. In particular, the Department will work with these groups and individuals to undertake or continue reductions in the discharge of pollutants and achieve the established TMDLs for impaired waterbodies.

This Status Report provides a preliminary identification of impaired waters in the Middle St. Johns Basin that may require the establishment of TMDLs. The report broadly characterizes the basin's setting and its surface water and ground water resources, permitted discharges, and land uses. In addition, it describes historical, current, and proposed watershed management activities.



The tables in the Status Report include the current planning list of potentially impaired waterbodies. Also included are a table of delisted waterbodies and parameters (potentially impaired waters from the 1998 planning list that were determined, based on new data, to be currently not impaired) and a list of waters for which there are not enough data to determine water quality status.

The information in this report will be used to identify waters and parameters for which additional data are needed to verify water quality impairments. Subsequent data gathering and monitoring will focus on these potentially impaired waters. The data will then be reevaluated and reassessed, and the Department will develop a list of waters for which impairments have been verified and for which TMDLs will be developed.

The verified list of impaired waters will be adopted by Secretarial Order in accordance with the Florida Watershed Restoration Act. Once adopted, the list will be submitted to the U.S. Environmental Protection Agency (EPA) for approval as the state's Section 303(d) list for the basin.

Summary of Findings

Table 4.1 in Chapter 4 summarizes the potentially impaired waters in the Middle St. Johns Basin, based on data from January 1991 to December 2000, retrieved from the **STOR**age and **RETR**ieval database and local government databases. **Tables 4.2a** and **4.2b** in Chapter 4 summarize the status of waterbody types in each planning unit for assessed and potentially impaired waters in the basin, based on STORET data from 1991 to 2001. The following summarizes water quality by waterbody type for waters with sufficient data for assessing impairment, according to the protocol described in the impaired surface waters rule, also known as IWR (Identification of Impaired Surface Waters Rule, Section 62-303, Florida Administrative Code).

Lakes

The majority of waterbody segments in the Middle St. Johns Basin are lakes. All planning units have lake segments. There are 220.1 square miles of lake waterbody segments (including the lake's watershed) in the basin, with 589 monitoring stations with data for the impairment parameters. Of the total square miles, 132.7 square miles (60.3 percent) were assessed for metals impairments, 171.8 square miles (78 percent) were assessed for nutrients impairments, 148.9 square miles (67.6 percent) were assessed for conventional impairments, 126.7 square miles (57.6 percent) for biology and fish, and 73.7 square miles (33.5 percent) for pesticides. None of the planning units had adequate data to allow the assessment of all lakes within their area.

Of the total lake area in the basin, 112.2 square miles (51 percent) were potentially impaired for metals, 141.7 square miles (64.4 percent) were potentially impaired for nutrients, 103.6 square miles (47 percent) were potentially impaired for conventionals, and 90.8 square miles (41.3 percent) for biology and fish. The Alexander Springs Creek planning unit had no potential impairments for lake waterbody segments out of the square miles assessed. The metals found in lakes of the Middle St. Johns are iron,

cadmium, selenium, lead, and silver. The most common conventional stressor is DO.

Streams

Streams are found in every planning unit in the Middle St. Johns Basin. The Alexander Springs Creek planning unit, which has only 0.2 miles of total stream length, did not have monitoring stations with data for the impairment parameters. The total mileage of stream length for the basin is 374.3 miles, with 160 stations for monitoring impairment parameters. Of the total mileage, 278.6 miles (74.4 percent) were assessed for metals impairments, 306.3 miles (81.8 percent) were assessed for nutrients impairments, 329.3 miles (88 percent) were assessed for conventional impairments, and 334.8 miles (89.4 percent) were assessed for biology/fish.

The assessment concludes that 219.4 miles (58.6 percent) of the total stream miles in the basin were potentially impaired for metals, 226.8 miles (60.6 percent) were potentially impaired for nutrients, 289 miles (77.2 percent) were potentially impaired for conventionals, and 185.1 miles (49.5 percent) were potentially impaired for biology/fish. Among streams in the basin, lead and copper were the most common stressors for the metals parameters. DO was the most common stressor in streams for conventional parameters. Biology was also regularly reported.

Blackwater Streams

Streams classified as blackwater had a pH less than 6.0 and a color value greater than 275 platinum cobalt units (PCUs). Within this basin, only one planning unit had waterbody segments that met this definition of blackwater streams. The Deep Creek planning unit has 2 blackwater streams (**Appendix I**) with a total mileage of 8.7 miles. There are a total of 5 monitoring stations with data for the impairment parameters. Of the total blackwater stream mileage, 3.7 miles (42.5 percent) were assessed for metals impairments, 3.7 miles were assessed for nutrients, 3.7 miles were assessed for conventionals, and 3.7 miles were assessed for biology.

The evaluation concluded that 42.5 percent of the total blackwater streams in the basin were potentially impaired for metals and DO. Blackwater streams were not impaired for biology/fish or nutrients.

Springs

Total spring length is 30.7 miles, with 16 monitoring stations having enough data to assess potential impairments. All the planning units in the basin contain springs, except for Lake Jesup, Deep Creek, and the Econlockhatchee River. Three springs in the basin were placed on the 1998 303(d) list for potential impairments. Volusia Blue Spring, in the Lake Woodruff planning unit, is listed for potential impairment for nutrients; Wekiwa Springs, in the Wekiva River planning unit, is listed for potential impairments for nutrients and coliforms; and Rock Springs Run, in the Wekiva River planning unit, is listed for potential impairments for nutrients, coliforms, DO, and biochemical oxygen demand (BOD).

Of the total mileage of spring segments in the basin, 5.6 miles (18.2 percent) were assessed for metals impairments, 10.6 miles (34.5 percent) for



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nutrients impairments, 10.6 miles (34.5 percent) for conventionals, and 5.6 miles (18.2 percent) for biology. Total mileage of springs impaired for conventionals was 10.6 miles (34.5 percent) and 5.6 miles (18.2 percent) were impaired for metals; no springs were impaired for nutrients or biology.

Contents of This Report

- **Chapter 1: Introduction** briefly characterizes the purposes and content of the Status Report, describes how the watershed management cycle will be implemented in the Department's Central District, and describes the planning units used as the geographic basis for the assessment and documentation of conditions in the Middle St. Johns Basin.
- **Chapter 2: Basin Overview** characterizes the basin's general setting, water resources, and historical, current, and proposed watershed management activities and processes.
- **Chapter 3: Water Quality Evaluation by Planning Unit** provides, by basin planning unit, an evaluation of water quality, permitted discharges and land uses, an ecological summary, and a summary of planning and management activities.
- **Chapter 4: Planning List of Potentially Impaired Waters** contains the planning list of impaired waters and a summary of the methodology used in developing the list. It describes the relationship between the planning list and subsequent verified and 303(d) lists, and also provides summaries of waters that are not impaired, waters proposed for delisting, and waters without enough data to be assessed for impairments.
- **Chapter 5: Data Needs and Strategic Monitoring Priorities** includes a summary of strategic monitoring requirements, needs, and priorities for the next phase of the watershed management cycle. It also includes a general inventory of monitoring and data-gathering activities by other groups and programs that could be incorporated into the assessment, and outlines the steps to be taken in preparing a strategic monitoring plan.



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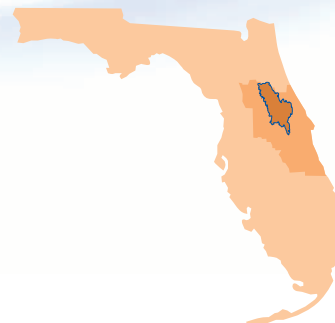
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Chapter 1: Introduction

Chapter Summary

This introductory chapter describes the purposes and content of the Status Report and explains the schedule for implementing the watershed management approach in the Central District of the Florida Department of Environmental Protection (Department). It also briefly describes the smaller assessment units, called planning units, used to prepare the report.



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 beneficial uses are met.

Purposes and Content of the Status Report

The Department is implementing a statewide watershed management approach for restoring and protecting water quality and addressing **total maximum daily load** (TMDL) program requirements for waters that are impaired (see the sidebar for a definition of a TMDL). The watershed management approach is a cyclical management process in which the diverse stakeholders in each of the state's basins are involved in identifying and solving water resource problems and addressing TMDL requirements (see **Noteworthy** for a description of the five phases of the watershed management cycle). **Appendix A** provides a detailed description of the watershed approach.

This report documents the findings of a preliminary assessment of water quality in the Middle St. Johns Basin, presents a planning list of potentially impaired waterbodies, identifies general water quality monitoring needs, and provides an overview of water quality restoration plans and projects. It is intended for distribution to an audience of potential stakeholders, including decision makers from federal, state, regional, tribal, and local governments; public and private interests; and individual citizens.

The Status Report will be followed by a period of monitoring and data gathering and, in approximately 18 months, by an assessment report that documents the results of a detailed assessment of water quality. The assessment report will include additional data, a more complete evaluation of water quality and biological resources, and a list of waterbodies that will be included on the verified list of impaired waters required by Section 303(d) of the federal Clean Water Act. The verified list is to be adopted by the Department in accordance with the 1999 Florida Watershed Restoration Act (Chapter 99-223, Laws of Florida).

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

Figure 1.1 shows the order in which the watershed management cycle will be implemented in the Department's Central District basin groups. These groups were identified on the basis of the U.S. Geological Survey's (USGS) hydrologic unit codes (HUCs) for these basins.

The Ocklawaha, a Group 1 basin, was the first to be assessed in 2000. The Group 2 basin, the subject of this Status Report, is the Middle St. Johns River. The Group 3 basin, the Upper St. Johns, will be assessed in 2002. The Group 4 basin, the Kissimmee River, will be assessed in 2003, and Group 5, the Northeast Coast and Indian River Lagoon, in 2004. In 2005, the cycle will begin again for the Group 1 basin, Ocklawaha.





Planning Units

The Middle St. Johns Basin encompasses many square miles. To provide a smaller-scale geographic basis for assessment, reporting, and planning activities under the watershed management approach, the Department subdivided the Group 2 area into smaller areas called planning units. These planning units were adopted from delineations made by the St. Johns River Water Management District (SJRWMD). The Middle St. Johns Basin contains nine planning units: Alexander Springs Creek, Deep Creek, Econlockhatchee River, Lake George, Lake Jesup, Lake Kerr, Lake Monroe, Lake Woodruff, and Wekiva River. **Figure 1.2** shows these planning units, and Chapter 3 contains more detailed descriptions.

Water quality assessments were conducted on individual waterbody segments within planning units. Each waterbody segment is assigned a unique waterbody identification (WBID) number.

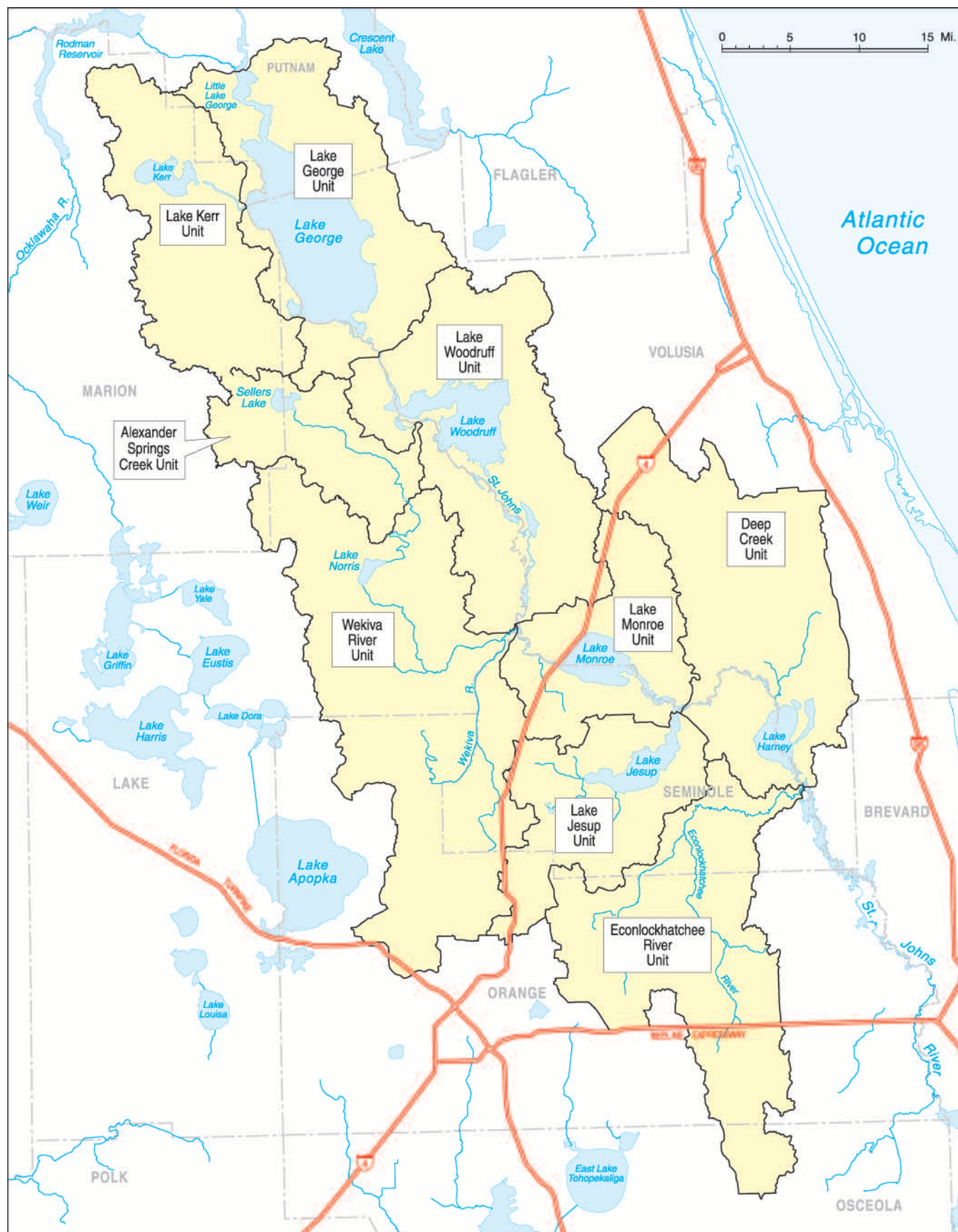


Figure 1.2: Planning Units in the Middle St. Johns Basin

The Five Phases of the Watershed Management Cycle

TMDLs will be developed, and the corresponding load reductions allocated, as part of the Department's watershed management approach, which rotates through the state's 52 river basins over a 5-year cycle. Extensive public participation will be crucial throughout the cycle's 5 phases, as follows:

Phase 1: Watershed Evaluation. For each basin group, the Department will conduct a preliminary evaluation of the status of the quality of surface water and ground water. This information will be used to generate a planning list of potentially impaired waters for which TMDLs may be needed. The planning list is presented as part of the Basin Status Report. At the end of Phase 1, a strategic monitoring plan will be developed.

Phase 2: Strategic Monitoring. Monitoring will be conducted and additional data gathered to help verify whether waters are, in fact, impaired and to collect the data needed to calibrate and verify models for TMDL development. At the end of Phase 2, an assessment report will be produced. This report will contain

an updated and more thorough assessment of water quality, associated biological resources, and current restoration plans and projects. Waters that are verified as being impaired will be placed on a basin-specific list of impaired waters that will be adopted by the Department through a Secretarial Order. This verified list will be submitted to the U.S. Environmental Protection Agency (EPA) as the state's Section 303(d) list of impaired waters for the basin.

Phase 3: Developing and Adopting TMDLs. TMDLs for priority impaired waters in the watershed 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, water bodies will be prioritized using the criteria in the Identification of Impaired Surface Waters Rule, Section 62-303, Florida Administrative Code.

Phase 4: Developing a Watershed Management Plan. A watershed management plan will be developed specifying how pollutant loadings from point and

nonpoint sources of pollution will be allocated and reduced, in order to meet TMDL requirements. The plan will include regulatory and nonregulatory (i.e., voluntary), structural and nonstructural improvements. The involvement and support of affected stakeholders in this phase will be especially critical.

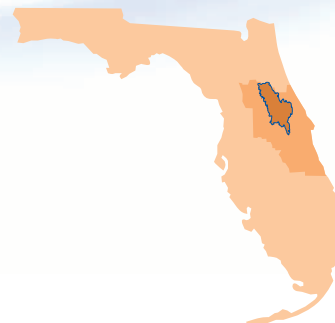
Phase 5: Implementing the Watershed Management Plan. Implementation of the activities specified in the watershed management plan will begin.

The watershed management approach is an iterative process. One of its key components is the measurement of the effectiveness of management activities (TMDL implementation) in successive cycles. Monitoring conducted in Phase 2 of subsequent cycles will include evaluation of 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.

Chapter 2: Basin Overview

Chapter Summary

This chapter briefly describes the basin's setting and characterizes major surface water and ground water resources. It also summarizes historical, current, and proposed watershed management issues and activities.





Basin Setting

The St. Johns River lies in a low-gradient river valley inland from and parallel to Florida's east coast. Including its tributaries, it drains about 9,168 square miles (Foose, 1981) and flows north for about 300 miles from marshes in St. Lucie County to the Atlantic Ocean in Jacksonville. The Middle St. Johns Basin portion encompasses about 2,037 square miles of central Florida, including the St. Johns River and the land that drains to it from the confluence of the Ocklawaha River near Welaka south and through Lake Harney.

Moving from south to north, the basin includes all or portions of the following counties: Seminole, Osceola, Orange, Lake, Marion, Volusia, and Putnam. Major cities are metropolitan Orlando, DeLand, Altamonte Springs, Maitland, Sanford, Casselberry, Oviedo, and Winter Park. Of these, Orlando is the largest city. **Figure 2.1** shows the major geopolitical features of the Middle St. Johns Basin.

Orlando and the Interstate 4 corridor in the southern half of the basin are largely developed land uses. In contrast, large areas of the northern basin around Lake George are forested (the Ocala National Forest) and rural. Multiple entities are involved in the management of water resources and planning efforts in the basin (**Figure 2.1**). Water resource management is the primary responsibility of the St. Johns River Water Management District (SJRWMD) and the Department's Central District. Comprehensive planning activities involve the Florida Department of Community Affairs, the East Central Florida Regional Planning Council, and the Withlacoochee Regional Planning Council for Marion County, along with local governments.

Population and Land Use

Table 2.1 lists historical, current, and projected population figures for the basin's counties and major cities. Orange County is the most densely populated county in the basin. Relatively small portions of Putnam and Marion Counties are included in the basin, and those portions are largely rural or contained within the Ocala National Forest.

Table 2.2 shows breakouts for basinwide land uses. Prominent types of land use in the basin are upland forests, wetlands, urban and built-up, and water. **Silviculture** is also an important land use. Pine plantation and forest regeneration land uses occupy about 15.3 percent of the basin. Most upland forest is located in the northern part of the basin, approximately from Lake Woodruff north and including the eastern corner of the basin east of Lakes Jesup and Monroe. A large part of this forest type is in the Ocala National Forest. Large wetland systems can be found around Lakes Woodruff, Jesup, and Monroe and the stretches of the St. Johns River between lakes.

The intensity and type of anthropogenic land uses vary by area of the basin. Urban land use is concentrated around Orlando and along the northeastern Interstate 4 corridor. Primary agricultural activities

Silviculture

The care and cultivation of forest trees.



Table 2.1: Population Statistics for the Counties and Major Cities in the Middle St. Johns Basin

County or City	1950 Census Population	1990 Census Population ^{2,3}	2000 Census Population ^{2,3}	2020 Projected Population ^{2,3}
Marion County	38,187	194,833	258,916	379,642
Lake County	36,340	152,104	210,528	321,900
Putnam County	23,615	65,070	70,423	80,614
Volusia County	74,229	370,712	443,343	583,837
Orange County	114,950	677,491	896,344	1,338,3000
Seminole County	26,883	287,529	365,196	514,800
Casselberry		18,849	22,629	
Oviedo		11,114	26,316	
Orlando		164,674	185,951	
Maitland		8,932	12,019	
DeLand		16,622	20,904	
Altamonte Springs		35,167	41,200	
Sanford		32,387	38,291	
Winter Park		22,623	24,090	
Winter Springs		22,151	31,666	

¹Forstall, R. March 27, 1995.

²Smith and Nogle. October 2001.

³East Central Florida Regional Planning Council, 2002.

Table 2.2: Basinwide Land Use Breakouts

Category	Square Miles of Basin	Percentage of Basin Area
Urban and Built-up	388.1	19.05
Agriculture	180.2	8.84
Rangeland	93.8	4.61
Upland Forest (includes Pine Plantation)	655.86	32.19
Water	200.69	9.85
Wetlands	489.1	24.01
Transportation, Communication, Barren Land, Other	29.5	1.44

are improved pasture and field crops, with some citrus. Ferneries are an important horticultural activity in the basin. Leatherleaf fern is the most common commercial fern grown for use in the floral industry. Reports from the early 1990s indicated that there were 4,282 acres of commercially grown leatherleaf fern in Volusia County, 832 acres in Putnam County, and 438 acres in Lake County (Singleton, 1996). About half the acreage for Lake and Putnam Counties is in other river basins.

Future growth is expected in and around DeLand, and continued development pressure from the growth of Orlando may affect lands along the Wekiva and Econlockhatchee Rivers and around Lake Jesup (SJRWMD, 2000a). An increase in commercial and industrial development is anticipated along the Interstate 4 corridor (SJRWMD, 2000a).

Publicly owned lands in the basin include state parks, preserves/reserves, wildlife management areas, and state and national forests (**Figure 2.2**). The larger and better known public lands include the Ocala National Forest, Wekiwa Springs State Park, Rock Springs Run State Reserve, Seminole State Forest, Blue Spring State Park, and Lake George State Forest and Conservation Area.



The land cover used to identify natural communities was mapped by the Florida Fish and Wildlife Conservation Commission from Landsat imagery taken from 1985 to 1989. In contrast, the land use data in this report were mapped by the St. Johns River Water Management District from color infrared photography taken between late 1993 and 1995. The total acreage and percentage of different land covers obtained from Landsat imagery differs from the values obtained for land use interpreted from aerial photography for a number of reasons. Besides the difference in dates of mapping, different land cover classification schemes were used and the Landsat imagery had less resolution than the aerial photography.

Xeric

Adapted to extremely dry conditions.

Ecological Resources

Natural Communities

The Florida Fish and Wildlife Conservation Commission (FWC) used land cover maps to identify major natural communities in the basin. The maps identified 22 different land cover classifications: 17 classes of natural vegetation, 1 aquatic class, and 4 classes of disturbed land. The mapping is not intended to accurately portray current land use. Rather, it provides a relative picture of the type and spatial importance of natural communities in the Middle St. Johns Basin, and overall appears to have an accuracy of 80 to 90 percent (Cox et al., 1994).

Table 2.3 lists the estimated acreage and percentage of basin area occupied by each natural community type. **Table B-1** in **Appendix B** contains more complete descriptions of each type. **Table B-2** contains a summary for each planning unit. Disturbed community types occupy the greatest acreage, covering about 414,842 acres, or almost 32 percent, of the basin. Of these, shrub and brushland (about 181,869 acres) occupy the greatest acreage of disturbed land. This category includes lands that are disturbed as part of the harvesting of commercial pine plantations. Pinelands occupy 13 percent of the basin. Commercial pine plantations (silviculture) are included in pinelands acreage.

A number of different natural communities occupy the remaining acres of the basin. Predominant upland types are sand pine scrub, dry prairie, and hardwood hammock. Three **xeric** community types—sand pine scrub, sandhill, and xeric oak scrub—combined occupy a little more than 14 percent of the basin. All three of these communities occur on sandy soils and are generally associated with areas of high to moderate aquifer recharge. They are most prominent in the Alexander Springs and Lake Kerr planning units and are largely part of the Ocala National Forest.

Table 2.3: Acreage and Percentage of Basin Area of Natural Communities

Community Type	Acreage	Percentage of Basin Area
Upland Community Types		
Dry Prairie	54,089	4.15
Pinelands	170,351	13.08
Sand Pine Scrub	103,371	7.94
Sandhill	40,360	3.10
Xeric Oak Scrub	41,526	3.19
Mixed Pine Hardwood Forest	23,944	1.84
Hardwood Hammock and Forest	81,815	6.28
Wetland and Aquatic Community Types		
Freshwater Marsh and Wet Prairie	42,924	3.3
Cypress Swamp	51,169	3.93
Mixed Hardwood Swamp	121,399	9.32
Bay Swamp	17,026	1.31
Shrub Swamp	21,620	1.66
Disturbed Land		
Grassland/Agricultural Land	114,963	8.83
Shrub and Brushland	181,869	13.96
Barren Land	118,010	9.06

Scrub habitat is found on sand dunes or sandbars that were once part of ancient shorelines. Scrub communities are largely endemic, or unique, to Florida and, along with sandhill communities, provide habitat for some of the basin's rarest species. Sandhill and scrub uplands along the east edge of Lake George comprise a Strategic Habitat Conservation Area for the Florida black bear (*Ursus americanus floridanus*) and bald eagle (*Haliaeetus leucocephalus*) (Cox et al., 1994). Farther south around Deltona and extending northeast and east to Blue Spring State Park, patches of sand pine scrub, sandhill, and xeric oak scrub provide important habitat for the Florida scrub jay (*Aphelocoma coerulescens*) (Cox et al., 1994).

Freshwater wetland communities occupy 19.5 percent of the basin. Major community types include mixed hardwood swamp, freshwater marsh, and cypress swamp. The greatest concentration of wetlands is in the Lake Woodruff planning unit. Hardwood swamps constitute a prominent wetland type in the Lake Woodruff and Wekiva River planning units, while cypress swamps are a common wetland type in the Deep Creek and Econlockhatchee planning units. Portions of the forested wetlands along the St. Johns River and Wekiva River comprise a Strategic Habitat Conservation Area for the Florida black bear, bald eagle, and American swallow-tailed kite (*Elanoides forficatus*).

Plant and Animal Species

The Middle St. Johns Basin supports a large and diverse number of plant and animal species. Wetlands around the large lakes provide habitat for nesting by wading birds and eagles. The density of active eagle nests around Lake George is one of the highest in the state. Lake George is one of 13 critical areas statewide needed to preserve the state's bald eagle population. The Ocala National Forest provides important habitat and conservation lands needed by the Florida black bear. The federally listed **anadromous** shortnose sturgeon (*Acipenser brevirostrum*), if still present, is now limited to the St. Johns River, but historically may have used the Ocklawaha River for spawning before the construction of the Kirkpatrick Dam. The collection of this fish has been rare in recent years (Hoehn, 1998). Parts of the Middle St. Johns River are salty enough to support a blue crab fishery.

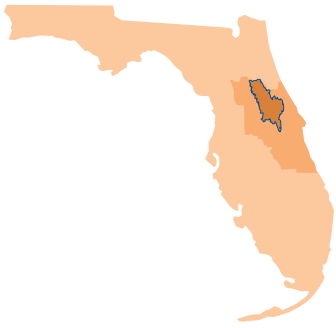
The basin contains 22 animal species and 33 plant species with either federal or state protected status. Of these, seven animal and eight plant species are federally protected. The U.S. Fish and Wildlife Service has identified 10 other plant species of management concern. **Tables B-3 through B-11 in Appendix B** contain species lists. Information for these tables was obtained from the Florida Natural Areas Inventory (FNAI) database dated October 2001.

A large number of endemic aquatic invertebrate species are associated with springs in the basin. There are four siltsnail species associated with springs in the Wekiva River planning unit (Hupalo et al., 1994). The Silver Glen Springs crayfish (*Procambarus attiguus*) is found only in Silver Glen Springs and the Blue Spring siltsnail (*Cincinnatia parva*) only in Blue Spring (Deyrup and Franz, 1994).



Anadromous

Fish that return to upstream spawning areas.



Florida Natural Areas Inventory Rankings

*In addition to the rankings established by state and federal governments, the Florida Natural Areas Inventory (FNAI) determines a species' global and state rank based on its status. Status is based on factors such as estimated abundance, range, adequacy of protection, ecological fragility (vulnerability), and threat of extinction. Several animal species in the basin are not protected species but have FNAI rankings indicating that they are imperiled or rare in Florida or very local in range (rankings of S2 and S3). These include the Florida scrub lizard (*Sceloporus woodi*), Sherman's fox squirrel (*Sciurus niger shermani*), snail bullhead (*Ameiurus brunneus*), and striped newt (*Notophthalmus perstriatus*).*

Several freshwater and one anadromous fish species found in the basin are rare or imperiled (Hoehn, 1998). These are fish species that are vulnerable because of restricted range or habitat preference or whose populations are declining and in need of management actions. The bluenose shiner (*Pteronotropis welaka*), shortnose sturgeon, and blueback herring (*Alosa aestivalis*) have been recorded from the St. Johns River or its large lakes. The blackbanded sunfish (*Enneacanthus chaetodon*) has been collected from the Wekiva River. FWC also classifies the bluenose shiner and shortnose sturgeon as species of special concern and endangered, respectively. The St. Johns population of bluenose shiners is disjunct from Panhandle populations (Gilbert, 1992).

The basin contains many unique and rare botanical specimens as well. The federally endangered beautiful pawpaw (*Derringtonthamnus pulchellus*), scrub lupine (*Lupinus westianus* var. *aridorum*), and federally threatened scrub buckwheat (*Eriogonum longifolium* var. *gnaphalifolium*) have been recorded. The state endangered Chapman's sedge (*Carex chapmanii*) and state threatened giant orchid (*Pteroglossaspis ecristata*) are also found in many parts of the basin.

Ecoregions

In general, ecoregions are delineated by patterns of homogeneity in a combination of factors such as climate, physiography, geology, soils, and vegetation. They were refined in Florida for application to aquatic ecosystems for use as an assessment and management tool. The Middle St. Johns Basin lies in the Southern Coastal Plain Ecoregion, also referred to as Ecoregion 75 (Griffith et al., August 11, 1994). Ecoregions are further delineated into smaller subcoregions, with specific delineation schemes for both lakes and streams. Stream and lake subcoregions are not intended to characterize the water quality of a specific lake, but rather define the expected biological potential of benthic (that is, occurring at the bottom of a body of water) macroinvertebrate communities for a given set of environmental characteristics.

Stream Subcoregions

Streams in the Middle St. Johns Basin occupy 2 of the 13 subcoregions delineated for Florida based on physical, chemical, and biological characteristics (Griffith et al., August 11, 1994). The basin lies within the Eastern Florida Flatwoods Subregion and the Central Florida Ridges and Uplands. The Eastern Florida Flatwoods are flat plains with 10 to 50 percent coverage by standing water. The expected natural vegetation is pine flatwoods and grassland and freshwater marsh and swamp associations. The Central Florida Ridges and Uplands are generally characterized by typically flat plains with sandy highlands and ridges and are commonly vegetated by longleaf pine and xerophytic oaks. Acidic and well-drained soil types underlie this subregion.

Lake Regions

Florida's lakes are divided into 47 lake regions according to differences in land cover, physiography or land surface form, soils, geology, natural

aquatic vegetation, and water quality. A lake region exhibits homogeneity as a grouping of lakes based on location and common chemical, biological, and landscape characteristics (Griffith et al., August 15, 1997). The Middle St. Johns Basin contains portions of 8 of the 47 lake regions (Griffith et al., August 15, 1997): Ocala Scrub, Eastern Flatlands, Crescent City/DeLand Ridges, Mt. Dora Ridge, Apopka Upland, Doctor Phillips Ridge, Orlando Ridge, and Osceola Slope. **Table B-13** in **Appendix B** provides descriptions of lake ecoregions in the basin.

The composition of benthic macroinvertebrate species in lakes is most strongly affected by water color and somewhat less by pH and geographic ecoregion (Gerritsen et al., 2000). Using this information, five distinct lake types were identified statewide that help to distinguish further the expected biological condition of a lake. Four of these types are found in the Middle St. Johns Basin: acid/colored, alkaline/colored, alkaline/clear, and acid/clear in Ecoregion 75. Acid/colored lakes are generally low in nutrients and biological productivity. By comparison, alkaline/colored lakes have higher nutrient levels and biological productivity. The lakes with the highest levels of nutrients and biological productivity are alkaline/clear. Lakes with the lowest levels of nutrients and lowest biological productivity are acid/clear lakes on sandy soils in Ecoregion 75. Many of these are found on ridges and uplands.

Surface Water Resources

Surface waters—including lakes, streams, wetlands, and springs—occupy almost 690 square miles, or about 34 percent, of the Middle St. Johns Basin (**Figure 2.3**).

Basin Climate and Hydraulics

Climate in the basin is characterized as warm temperate to subtropical. The basinwide average annual temperature is 70.2° F., and annual rainfall averages 56.51 inches based on climate records from 1971 to 2000 for DeLand. Rainfall patterns vary spatially and temporally. About half the annual average of rain falls from June through September (the wet season). Maritime tropical masses dominate the weather during the wet season and continental frontal systems during the rest of the year. Prevailing winds are northeasterlies in the fall and winter and southeasterlies in the spring and summer.

On average, 14 inches of the average 56.51 inches of rainfall each year appear as runoff in streams and lakes (Rumenik, 1988). Runoff includes water from rainfall that falls directly onto surface waters, flows off land, or infiltrates into ground water and later emerges in surface waters. Surface runoff peaks in late summer and autumn.

Streams

Streams occupy 13.3 square miles, or about 0.65 percent, of the basin. The dominant stream feature is the St. Johns River. A variety of stream types, ranging from blackwater to spring-fed runs, are found in the basin.



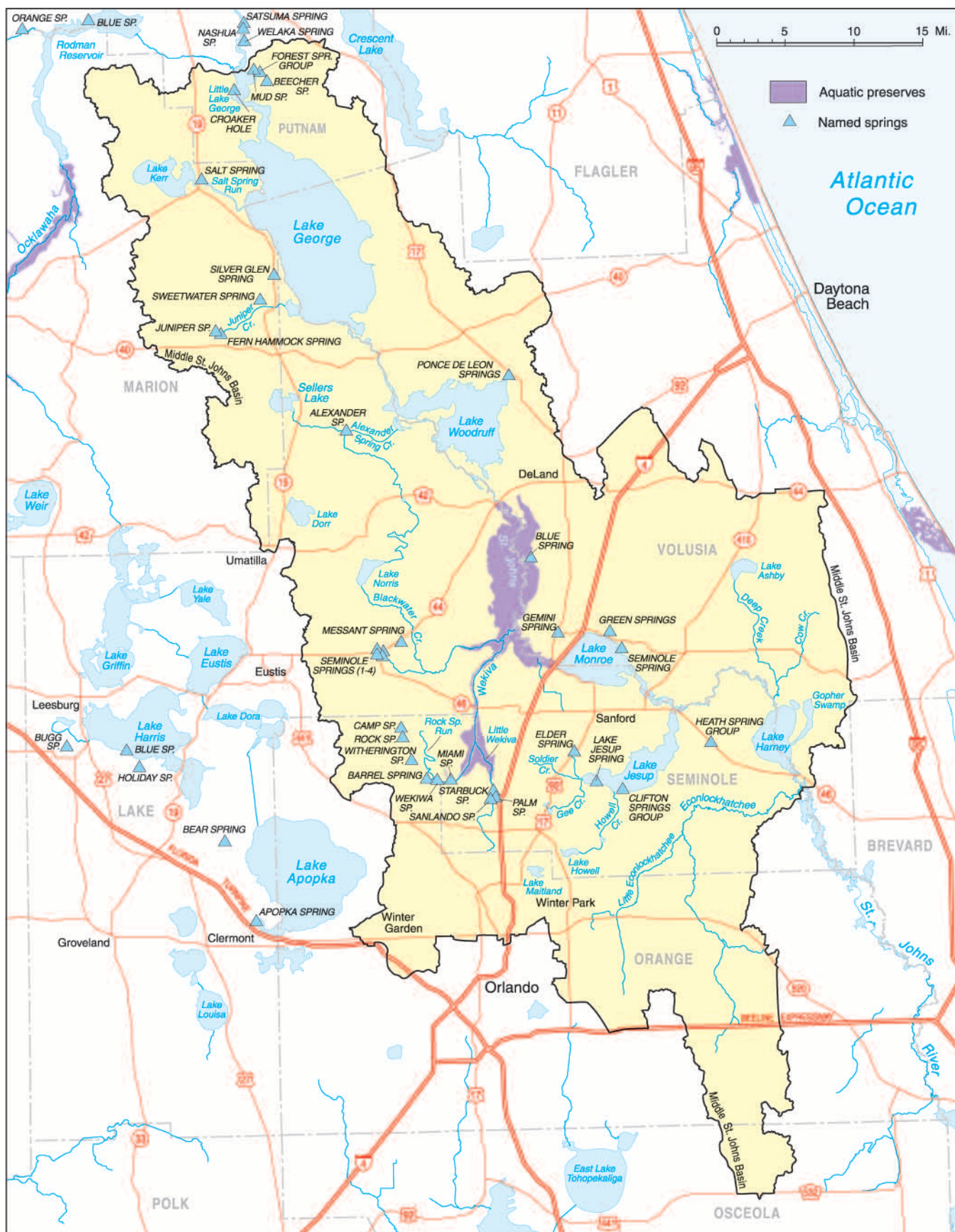


Figure 2.3: Surface Water Resources of the Middle St. Johns Basin

St. Johns River Main Stem

The Middle St. Johns River comprises a series of elongated lakes connected by river segments. It is classified among Florida rivers as a large river (Nordlie, 1990).

Water moves from south to north downstream through Lake Harney, Lake Monroe, Lake Woodruff, and Lake George, to the confluence of the St. Johns with the Ocklawaha River. Lakes Harney, Monroe, and George are wide spots in the St. Johns River that, because of their width, have the hydraulic characteristics of lakes. As the river moves downstream from Lake Harney, its channel becomes more defined with elevated banks (DeMort, 1991).

The St. Johns River throughout its length has a low gradient, averaging about 0.1 foot per mile (Campbell et al., 1993). Because of the low stream gradient, tidal reversal may occur as far upstream as Lake Monroe (DeMort, 1991), although this lake is well over 100 miles from the Atlantic Ocean. It is more typical for daily tidal reversals to occur as far downstream as Lake George (DeMort, 1991).

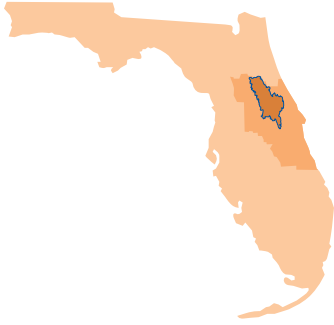
The river receives ground water flow from several springs or spring-fed rivers. The most notable spring-fed river is the Wekiva River, which starts as a discharge from Wekiwa Springs and enters the St. Johns just north of Lake Monroe. Between Lake Monroe and Lake George, the St. Johns River receives flow from Blue, DeLeon, and Alexander Springs. Alexander Springs enters the St. Johns River at Lake Woodruff. Juniper, Silver Glen, and Salt Springs discharge to creeks along the western shore of Lake George. Croaker Hole Spring discharges through the riverbed into Little Lake George. Lake Monroe also receives flow from its tributaries, Bethel Creek and DeBary Drain.

Between Lake Harney and Lake Monroe, the river is somewhat saline because of shallow marine salt deposits (DeMort, 1991). The discharge from many of the springs also contains a fairly high concentration of salts, producing a measurable salinity. The source of this salt is trapped relict seawater or deeper brackish water released by upwelling through fractures or faults in the aquifer (Toth, 1999). Salt is trapped in the aquifer most probably from incomplete flushing of saline water that entered the Florida aquifer during the last rise of sea level that covered Florida (Knochenmus and Hughes, 1976). Springs with high salt concentrations are Croaker Hole in the riverbed within Lake George; Salt, Silver Glen, Sweetwater, and Alexander near Lake George; Gemini and Blue north of Lake Monroe; and Ponce de Leon near Lake Woodruff (Toth, 1999). Salinity in these areas is high enough to support blue crabs.

Tributary Watersheds

There are nine major tributary watersheds, including three drainage basins for the large lakes that are part of and include the main stem of the St. Johns River. These are the planning units for this basin. Tributary watersheds that are not part of the river's main stem are, from south to north, Econlockhatchee River, Lake Jesup, Deep Creek, Wekiva River, Lake Kerr, and Alexander Springs. Descriptions of the tributary watersheds





Karst

A type of topography that is characterized by caves, sinkholes, springs, and other types of openings caused by dissolution of limestone.

were taken from the Middle St. Johns River Surface Water Improvement and Management Plan (SJRWMD, 2002) unless otherwise noted.

The Alexander Springs watershed drains almost 100 square miles of largely undeveloped land. Other than isolated lakes, Alexander Springs Creek is the major stream in this watershed. It receives its discharge from Alexander Springs and several small tributaries that, along with the spring, form the headwaters. Alexander Springs Creek enters wetlands along the St. Johns River at Lake Woodruff.

The Deep Creek watershed, which includes Lake Harney, is an aggregate of several smaller tributary watersheds that drain to the St. Johns River. The watershed drains 274 square miles.

The Econlockhatchee River watershed drains 280 square miles of the western edge of the watershed between Orlando and Bithlo and is 35.8 miles long. The second largest tributary of the St. Johns River, it enters the St. Johns River south of Lake Harney. The headwaters for this river include a large swamp drainage known as the Econlockhatchee Swamp and a **karst** area with internal drainage. The channel in the lower portion of this tributary is cut into the shallow water aquifer, which provides base-flow at all times. The major tributary is the Little Econlockhatchee River, which drains 71 square miles and is 14.8 miles long.

The Lake Jesup watershed drains 145 square miles. It has only one discharge point from Lake Jesup to the St. Johns River, consisting of a narrow outlet channel by the State Road (S.R.) 46 bridge upstream of Lake Monroe. Historically, the lake connected to the St. Johns by both river channel and floodplain marshes. Eleven streams flow into Lake Jesup, of which 4 are major tributary streams: Gee Creek, Howell Creek, Soldier Creek, and Sixmile Creek. The largest by drainage area is Howell Creek, which originates in Lake Maitland in Orlando and drains 52 square miles. Lake Maitland receives the discharge from numerous lakes, which are connected by channels or underground pipes. A fixed elevation control structure controls Lake Maitland's water level. Howell Creek then continues northeasterly through Lake Howell. Most of the Howell Creek watershed is highly urbanized, with extensive loss of wetlands and floods during major storm events (Rao et al., 1994).

The Lake Kerr watershed drains about 188 square miles (Adamus et al., 1997). The major waterbody, Lake Kerr, discharges to Lake George through Salt Springs Run.

The Wekiva River watershed drains more than 376 square miles. The river forms from the confluence of Wekiwa Springs Run and Rock Springs Run and flows for approximately 14.2 miles before joining the St. Johns River north of Lake Monroe. A large part of the river's discharge is from springs, on average 64 percent of the total measured flow. Its major tributary is the Little Wekiva River. This urbanized tributary drains 42 square miles of largely high-density development. Part of the Little Wekiva River channel has been replaced by an underground pipe.

Lakes

The total surface area of lakes is 174.3 square miles, or about 9.17 percent, of the basin. Reservoirs occupy 12.53 square miles, or about 0.62 percent.

The largest lakes are the chains of lakes that comprise the St. Johns River. Lake George, the second largest lake in the state, has a surface area of 46,000 acres. It receives spring flow from Croaker Hole within the Little Lake George and via spring runs from Salt Springs, Silver Glen Springs, Juniper Springs, and Fern Hammock Springs. Lake Monroe covers 9,406 acres, Lake Jesup, 10,011 acres, and Lake Harney, 6,058 acres; these are the seventeenth, fifteenth, and twenty-sixth largest lakes, respectively, by area within the state (Dickinson et al., August 1982).

The chain of lakes (Harney, Monroe, and George) that forms the St. Johns River is believed to have initially developed from natural depressions in an ancient seafloor (Schiffer, 1998). These depressions were formed from the repeated scouring and redepositing of material by wave action and water currents. When sea level fell, these depressions filled with fresh water. Riverine processes have continued to enlarge the lakes.

Many of the other lakes in the basin formed from solution processes (Schiffer, 1998). Water moving downward from the land surface carries carbon dioxide, which forms carbonic acid when dissolved in water. This weak acid dissolves the limestone underlying Florida and eventually forms caves and caverns, which may cause the ground above to collapse, forming a sinkhole and ultimately a lake. Lakes formed by solution processes typically have a strong link with ground water (Schiffer, 1998).

Development in the basin has changed natural lake function (Schiffer, 1998). Canals and channels dug between the lakes have altered natural drainage systems. Extensive urbanization in the Orlando area and Interstate 4 corridor increases the amount of impervious surface, which in turn increases the volume of water delivered as runoff to lakes and delivers pollutants to the lakes.

Wetlands

Wetlands cover about 489 square miles, or about 24 percent, of the basin (**Figure 2.4**). They make up the littoral zones of lakes and streams; large expanses of wetlands are also found around Lakes George, Woodruff, and Dexter, the Wekiva River and upstream tributaries, and the St. Johns River south from Lake Monroe to the confluence with the Wekiva River. Named wetland systems include Blackwater Swamp, Wekiva Swamp, Seminole Swamp, and Gopher Swamp.

Wetland habitats in the Middle St. Johns Basin largely comprise mixed hardwood swamps, freshwater marshes, and cypress swamps.

Springs

Springs in Florida are important as surface water source waters, habitat for aquatic life, and recreation. Springs are an important component of the Middle St. Johns Basin, with an estimated 30 or more springs present. Alexander Springs, Silver Glen Springs, and Blue Spring are classified as first-magnitude springs, which have an average flow of 100 cubic feet per



Classification of Spring Discharge

Springs are classified by magnitude, or volume, of their flow or discharge. Eight different classifications are used (as modified by Rosenau, 1977).

- *Magnitude 1: ≥ 100 cubic feet per second*
- *Magnitude 2: 10 to 100 cubic feet per second*
- *Magnitude 3: 1 to 10 cubic feet per second*
- *Magnitude 4: 100 to 448 gallons per minute*
- *Magnitude 5: 10 to 100 gallons per minute*
- *Magnitude 6: 1 to 10 gallons per minute*
- *Magnitude 7: 1 pint to 1 gallon per minute*
- *Magnitude 8: < 1 pint per minute*

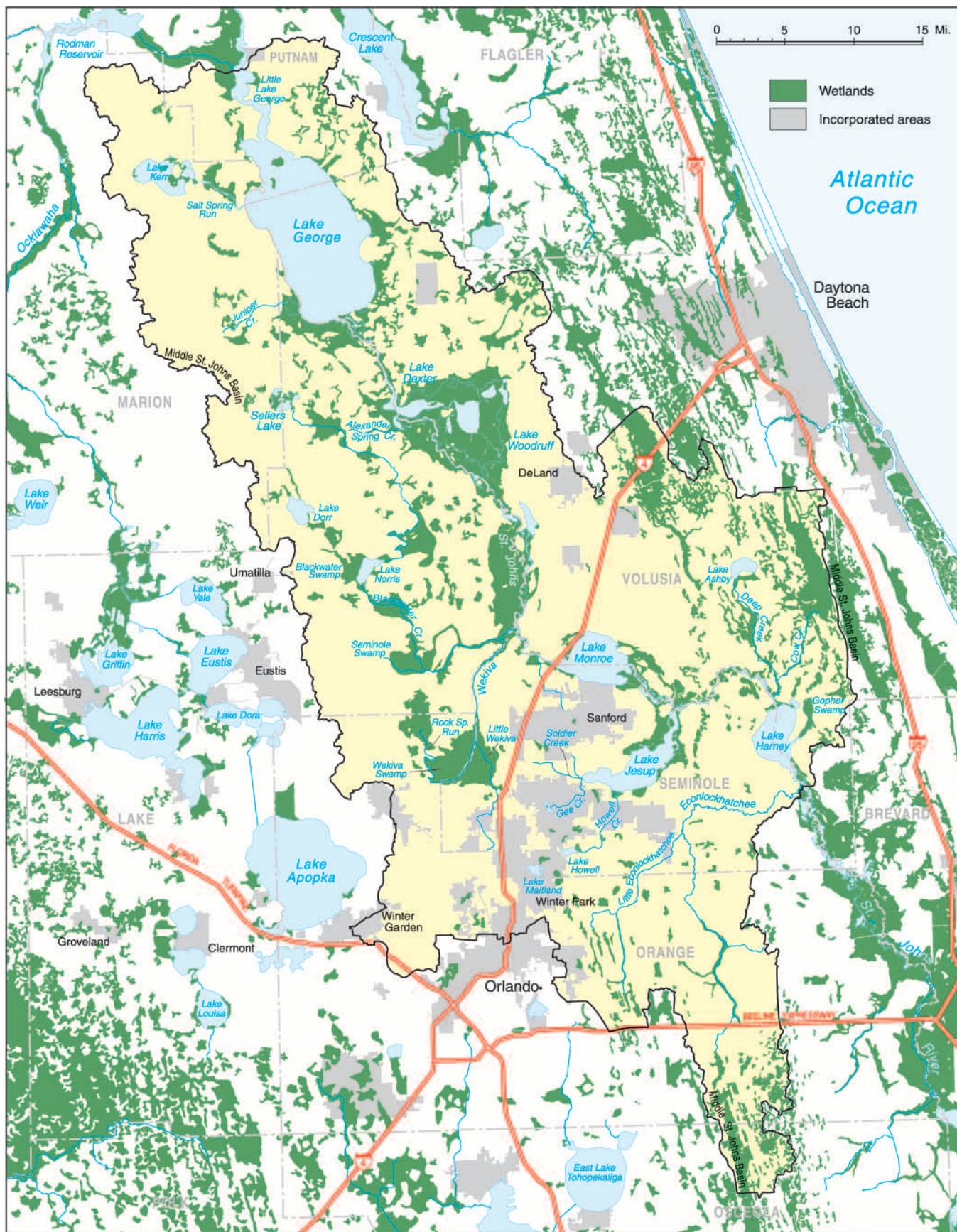


Figure 2.4: Wetlands in the Middle St. Johns Basin

second or greater. Croaker Hole Spring, in the bed of Little Lake George within the St. Johns River, provides a thermal refuge for striped bass. Other springs along the St. Johns River provide warm water refuges for manatees during the winter; Blue Spring, Salt Springs, Silver Glen Springs, and Ponce DeLeon Springs receive particularly heavy usage by manatees.

Springs in the basin generally discharge from the Floridan Aquifer and have water quality similar to ground water from the Floridan. Springs



Table 2.4: Springs in the Middle St. Johns Basin

Spring Name	Discharges to	Average Discharge (cubic feet per second)		Period of Discharge Measurement	
		A	B	A	B
Wekiwa Springs	Wekiva River	74.2	77.4	1932–1975	1999
Ponce de Leon Springs	Spring Garden, Woodruff, and Dexter Lakes	30.8	21.1	1929–1975	1999
Rock Springs	Rock Springs Run to Wekiva River	64.6	57.4	1931–1975	1999
Croaker Hole Spring	Little Lake George-St. Johns River				
Alexander Springs	Alexander Springs Creek to St. Johns River	120	86.8	1931–1972	1999
Seminole Spring	Seminole Creek	24.8	39.0	1931–1972	1999
Messant Spring	Blackwater Creek	20.5	16.9	1946–1972	1999
Sanlando Springs	Little Wekiva River	19.0	27.2	1942–1975	1999
Palm Springs	Little Wekiva River	9.48	6.7	1942–1975	1999
Starbuck Spring	Little Wekiva River	16.6	16.3	1944–1975	1999
Silver Glen Springs	Lake George	112	135.0	1931–1972	1999
Juniper Springs	Juniper Creek to Lake George	12.8	12.4	1935–1972	1999
Salt Springs	Lake George	83.2	83.0	1929–1972	1999
Fern Hammock Springs		1.41		1972 (1 measurement)	
Blue Spring	St. Johns River	162	160.0	1932–1974	1999
Sweetwater Spring	Juniper Creek		13.9		1999
Camp Lo No Chee Spring	Lake Norris	0.88		1954, 1972	
Beecher Spring	St. Johns River	10.71		1960, 1972	
Forest Springs Group	Little Lake George	0.304		1972	
Mud Spring	Little Lake George	2.26		1972	
Barrel Spring	Wekiva River				
Mill Creek Springs		4.7		1945	
Witherington Spring	Mill Creek	6.83		1945–1972	
Seminole Spring	Lake Monroe	0.045		1972	
Camp Spring					
Green Springs	Lake Monroe	0.88		1932–1972	
Clifton Springs	Lake Jesup	1.7		1972	
Elder Spring		8 gal/min		1972	
Heath Spring		12 gal/min		1972	
Lake Jesup Spring	Lake Jesup	1.04		1952, 1972	
Miami Springs	Wekiva River	5.84		1945–1972	
Gemini Springs	Lake Monroe	7.67	10.0	1972	1999

Source A: Rosenau et al., 1977.

Source B: Toth, 1999.



occur at places where the potentiometric surface of the Floridan aquifer is above the land surface and confining beds above the aquifer have been breached. **Table 2.4** lists the basin's springs and their discharges.

Surface Water Quality Classifications and Special Designations

All surface waters, including wetlands, in the Middle St. Johns Basin are designated as Class III in accordance with Section 62-302.400, Florida Administrative Code (see **Noteworthy** for information on Florida's surface water quality classifications). Many waters in the basin have been given additional protection through designation as Outstanding Florida Waters (OFWs) (see **Noteworthy** for a description of the designation). **Table 2.5** lists by county the OFWs or portions of OFWs in the Middle St. Johns Basin. A portion of the Wekiva River was designated as a Florida Scenic and Wild River Segment in 1982.

Physiography, Soils, and Geologic Framework

The land surface of the St. Johns River has been shaped predominantly by marine processes, with later modification by solution of the underlying carbonate material. The St. Johns River Valley was formed during the Pleistocene Epoch, during a period of barrier island formation. It is believed to have formed as part of a regressive or progradational beach ridge plain. Fluctuating sea levels created marine terraces at approximately 10, 30, 100, and 150 feet above the present sea level. Terraces are relatively flat areas separated by bluffs. They tend to parallel the modern-day coastline and are often associated with wind-built sand dunes. The course of the river was probably determined in part by the location of swales between **relict** beach ridges.

Relict

Ancient shorelines.

The St. Johns River in the middle portion of the basin, for the most part, lies in what is called the St. Johns Offset. It is called an offset because this part of the river has changed course from the valley of its origin to an older, narrower, westerly course (Scott, 1979). East of the St. Johns Offset and bounding it are the DeLand and Crescent City ridges. Soils on these ridges comprise medium-fine sand and silt and clayey sand (Scott, 1979). To the west of the St. Johns Offset are the Marion Uplands and Mount Dora Ridge. Clayey sand and medium-fine sand and silt underlie the upland and ridge, respectively (Scott, 1979). Common characteristics of the ridges are deep lakes, closed lake basins, low water tables, and subsurface drainage (Knochenmus and Hughes, 1976). The uplands are generally moderate in relief with numerous closed lakes that may become connected during high water, shallow lakes, and moderate depths to the water table (Knochenmus and Hughes, 1976). About at the latitude of Sanford, the St. Johns River returns to its course in the Eastern Valley. Soil types under the St. Johns Offset and Eastern Valley are generally shelly sands and clay (Scott, 1979).

Table 2.5: Outstanding Florida Waters in the Middle St. Johns Basin

County	Outstanding Florida Water	Effective Date
Waters within Ocala National Forest		
Marion	1. Juniper Springs	9/1/82
	2. Juniper Creek	9/1/82
	3. Salt Springs	9/1/82
	4. Salt Springs Run	9/1/82
	5. Lake Kerr	9/1/82
	6. Little Lake Kerr	9/1/82
Lake	7. Alexander Springs	9/1/82
	8. Alexander Springs Creek	9/1/82
	9. Lake Dorr	9/1/82
Land Acquisitions under EEL, CARL, LATF, and SOC Programs¹		
	1. Seminole Springs/Woods	8/8/94
Lake and Orange	2. B.M.K. Ranch	8/8/94
Volusia and Lake	Waters within Lake Woodruff National Wildlife Refuge	3/1/79
	Hontoon Island State Park	
Volusia	Blue Spring State Park	3/1/79
	DeLeon Springs State Recreation Area	5/14/86
Land Acquisitions under EEL, CARL, LATF, and SOC Programs¹		
	1. Stark Tract	10/4/90
	2. Volusia Water Recharge Area	3/1/79
Lake, Seminole, and Volusia	Wekiva River State Preserve Addition—except portion of St. Johns River between I-4 and the Wekiva River confluence	12/28/88
Lake, Orange, and Seminole	Wekiva River Aquatic Preserve	12/1/82
	Wekiva River Aquatic System—includes Wekiva River, Rock Springs Run and its tributary Sulphur Spring, Little Wekiva River south to its confluence with the southernmost run of Sanlando Springs, Blackwater Creek and Swamp (up to Lake Dorr), Lake Norris, Seminole Springs and Creek, Seminole Swamp, Sulphur Spring and Run, and Messant Spring and Creek.	12/28/88
Lake and Seminole	Wekiva Florida Scenic and Wild River Segment	12/1/82
	Lower Wekiva River State Reserve	12/1/82
Orange and Seminole	Wekiwa Springs State Park	3/1/79
Orange, Osceola, and Seminole	Econlockhatchee River System—including Econlockhatchee River and portions of tributaries ²	6/18/92
Land Acquisitions under EEL, CARL, LATF, and SOC Programs¹		
Seminole	1. Lower Econlockhatchee	8/8/94
	2. Spring Hammock	4/19/88
	3. Wekiva River Buffers	8/8/94

¹Definitions: Environmentally Endangered Lands (EEL), Conservation and Recreation Lands (CARL), Land Acquisition Trust Fund (LATF), and Save Our Coast (SOC).

²Tributaries defined in Section 62-302.700, F. A. C.

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 (Section 403.061[10], Florida Statutes). Water quality criteria, expressed as numerical or narrative limits of pollutants, 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 category)

Special Designations

The Outstanding Florida Water (OFW) designation is given to waters that are “worthy of special protection due to their natural attributes” (Section 403.061, Florida Statutes); these waters are listed in Section 62-302.700, Florida Administrative Code. The OFW designation affords the highest protection possible under state water quality rules. Its purpose is to protect ambient water quality.

The designation means that any new discharge requiring a Department or water management district permit (wastewater or stormwater discharges, for example) must meet higher water quality standards, with some exemptions. Generally, permits cannot be issued for new direct discharges of pollutants into an OFW that would lower existing water quality. New indirect pollutant discharges (i.e., discharges to tributaries or adjacent waters) also must not significantly degrade the OFW.

There are certain exemptions to these rules for activities intended to enhance public use of the waterbody. Legal discharges that existed at the time of designation are “grandfathered” and are not affected by an OFW designation, provided there is no change in what was permitted as a discharge.

Activities requiring an Environmental Resource Permit from a water management district or the Department can be affected by an OFW designation. Surface water management systems (primarily stormwater) with direct discharges to an OFW must meet additional design and performance criteria to achieve at least a 95 percent pollutant load reduction. Activities that do not require Department permits, such as boat speeds, fishing, river setback ordinances, and docks smaller than 500 square feet, are not affected by an OFW designation but may be regulated at a local level.

Ground Water Resources

Aquifer Systems

Aquifers in the Middle St. Johns Basin ground water flow system include the upper and lower Floridan aquifer system (FAS) and the surficial aquifer system (SAS) (Snell and Anderson, 1970; Spechler and Halford, 2001). The FAS is the deepest aquifer system. The lower FAS includes the upper part of the Cedar Keys Formation of Paleocene age, along with the Oldsmar Formation and the lower part of the Avon Park Formation, both of Eocene age. The upper FAS includes units of the Hawthorn Group of Miocene age and some undifferentiated overlying units of late Pliocene age. The lower FAS is frequently highly mineralized and is seldom used as a water source. The upper FAS is the primary source for public water systems in this area. The SAS consists of unconfined deposits near the surface of variable lithology, including sand, clays, and shell fragments. These produce small amounts of water serving mainly private wells and water systems serving small populations (Table 2.6).



Table 2.6: Stratigraphy and Hydrostratigraphy of the Middle St. Johns River Basin

Series		Stratigraphic Unit	Thickness (feet)	Lithology		Hydrostratigraphic Unit	Hydrogeologic Properties		
Holocene		Undifferentiated Deposits	0–150	Alluvium, clays, sands		Surficial Aquifer	Limited local supplies		
Pleistocene				Sands, some shell and thin clay beds					
Pliocene			0–100	Interbedded sand, silt and clay, and limestone					
Miocene		Hawthorn Group	0–200	Interbedded sand, silt and clay, and limestone		Intermediate Confining Unit	Principal confining unit for upper Floridan aquifer		
Eocene	Upper	Ocala Limestone	0–200	Limestone		Upper Floridan Aquifer	Principal source of ground water		
	Middle	Avon Park Formation	600–1,600	Limestone dolomite				Middle Sub-confining Unit	Low permeability
								Lower	Oldsmar Formation
Paleocene		Cedar Keys Formation	500–2,200	Dolomite with anhydrite gypsum and limestone		Sub-Floridan Confining Unit	Highly mineralized water; very low permeability		

Modified after Spechler and Halford, 2001; Blandford and Birdie, 1992; and Snell and Anderson, 1970.

Potentiometric

The potentiometric surface of an aquifer is defined as the level to which water will rise in a tightly cased well that penetrates the aquifer. The potentiometric surface fluctuates because of variations in recharge and discharge from the aquifer.

Ground Water–Surface Water Interactions

Each aquifer system has a different influence on the St. Johns River and other surface waterbodies in the basin. The FAS contributes to surface water flow directly through spring discharge and indirectly through diffuse upward leakage. The SAS is in direct contact with surface water, and it can discharge directly into lakes and streams. Discharge can also occur from wells when the **potentiometric** surface is above the land surface, unless the wells are capped or the well flow restricted. Ground water levels vary seasonally and generally are higher in October to November (after wet season) and lower in May to June.

Within the basin, the patterns of ground water flow among the aquifer systems are complex. When the potentiometric surface of each of the artesian systems is below the water table in the SAS, recharge can occur through semipermeable confining units. This is greatest in upland areas. Flow between aquifers depends on the relationship of the potentiometric surfaces of each of the systems, which varies over time and location. Ground water can potentially flow from any aquifer system to either of the other two, depending on these relationships. **Figure 2.5** shows the potentiometric surface of the FAS during 1995.

Recharge to the FAS is from the overlying SAS, and more directly from rainfall in areas where the SAS is either thin or absent and the limestones of the FAS are at or near the surface. Recharge comes from surface waterbodies, irrigation, septic tank systems, land application of domestic wastewater, and stormwater holding ponds. **Figure 2.6** shows recharge and discharge areas in the basin. Areas of highest recharge rate are the ridges to the east and west of the St. Johns River. Twelve or more inches of recharge per year can occur along the ridges.

Several major springs are present along the St. Johns River. About 59 million gallons per day (mgd) of Floridan aquifer water discharge into the river through these springs (Toth, 1993). Most direct ground water discharge, however, occurs along the course of the St. Johns River.

The surficial aquifer system is recharged by local rainfall, irrigation, surface waterbodies, and to a lesser extent by septic tank effluent and sewage or stormwater holding pond effluent (Toth, 1993). Recharge can also occur from the Floridan and intermediate systems, depending on potentiometry. Discharge from the surficial system occurs by seepage to surface waterbodies, by evapotranspiration where the water table is at or near the land surface, by well withdrawals, and by downward leakage to the underlying aquifer systems. Ground water in the surficial system generally flows toward and discharges into surface waterbodies. The St. Johns River receives a significant portion of the discharge. Currently, however, quantitative estimates have not been completed.

Water Use

The Middle St. Johns Basin encompasses a significant portion of Volusia, Lake, Seminole, and Orange Counties. **Table 2.7** indicates that the total freshwater use in 1999 for these 4 counties was about 400.17 mgd. This figure represents about 34.2 percent of the total use of the SJRWMD (1,169.4 mgd) for that year. Most of the water derives from the upper FAS.

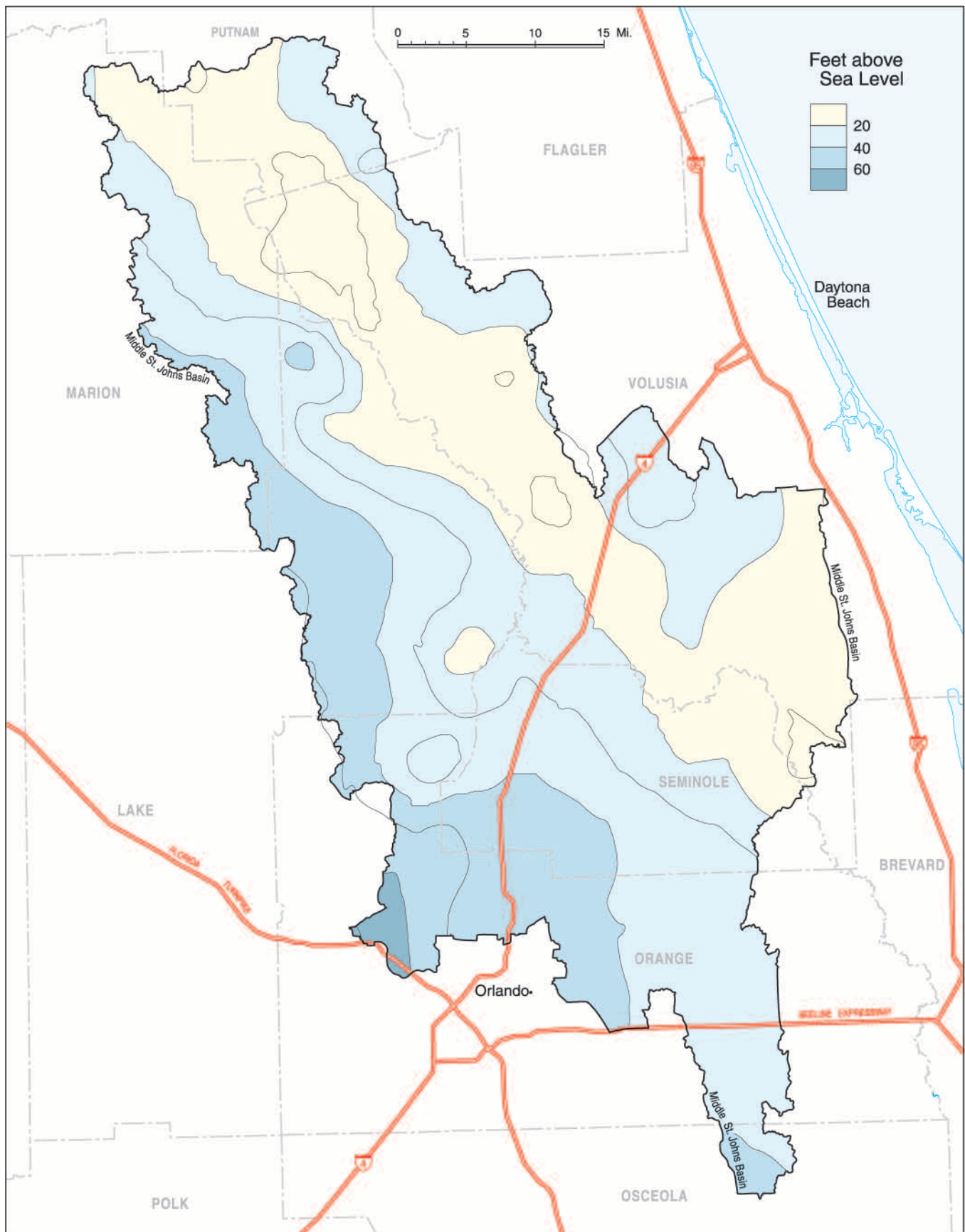


Figure 2.5: Potentiometric Surface of the Floridan Aquifer during 1995 Indicating the Direction of Ground Water Flow in the Middle St. Johns Basin

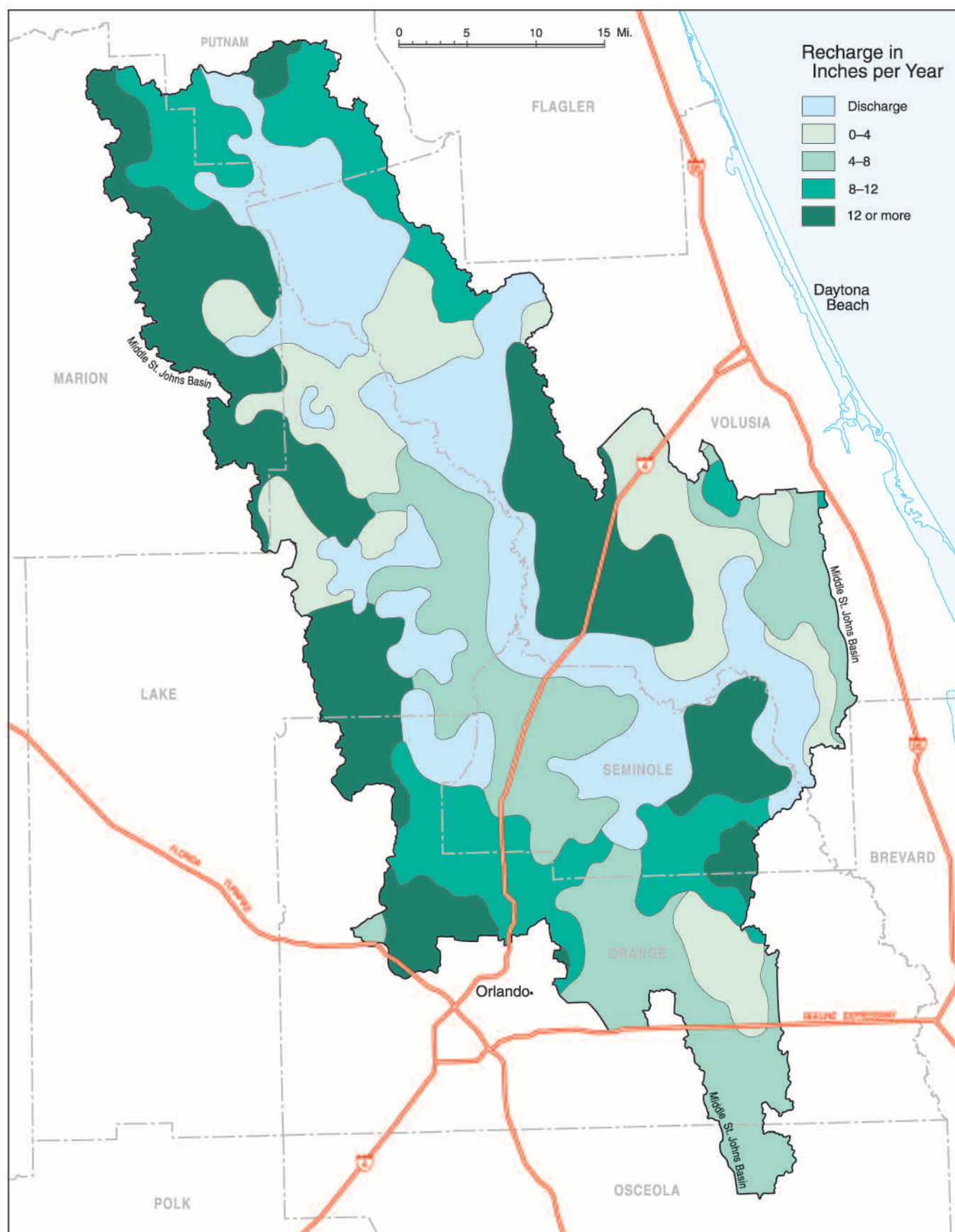


Figure 2.6: Recharge to the Floridan Aquifer in the Middle St. Johns Basin during 1995

Table 2.7: Freshwater Use in 1999 (in mgd)

County	Public Supply	Domestic Self Supply	Comm/ Industrial Self Supply	Agricultural Irrigation	Recreational Irrigation	Power Gen	Abandoned Flowing Art Well	Total
Volusia	55.5	2.74	0.58	25.63	4.78	3.90	0.10	93.23
Lake	36.5	2.71	10.59	32.42	1.94	0.00	0.08	84.24
Seminole	60.08	3.89	0.09	4.53	3.80	0.00	0.16	72.55
Orange	124.37	11.87	2.83	7.90	2.46	0.64	0.08	150.15
Total for Basin								400.17
Total for SJRWMD	543.2	92.0	127.8	344.6	32.5	25.8	3.5	1,169.4

Source: M. Dillon, July 8, 2002. St. Johns River Water Management District.

Although not broken down by county, the proportion of fresh surface water used for the entire SJRWMD is about 16 percent (189.9 mgd) of total fresh water used throughout the District in 1999. Most surface water comes from the St. Johns River in the Upper St. Johns Basin. **Table 2.7** breaks down water use by county into the following categories: commercial/ industrial self-supplied, agricultural irrigation, recreational irrigation, domestic self-supplied, public supply, power generation, and abandoned flowing artesian wells.

Water Supply Plan

The St. Johns River Water Management District Water Supply Plan was adopted by the District's Governing Board in April 2000 and finalized in June 2000. A large part of this basin is identified as a Priority Water Resource Caution Area (PWRCA) (**Figure 2.7**). SJRWMD (Vergara, 2000a) defines PWRCA as areas in the district where existing and reasonably anticipated sources of water and conservation efforts may not be adequate to supply water for all existing legal uses, to reasonably anticipate future needs, and to sustain water resources and related natural systems.

The five constraints established for identifying PWRCA are as follows:

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

Saltwater intrusion is probably the most significant threat to ground water quality in the basin. Overpumping of ground water can potentially have an adverse affect on the local ground water supplies and also cause unacceptable impacts to wetlands, surface water levels, and spring flows.

Anywhere from 158 to 241 mgd of additional potable water supplies will need to be developed from sources other than ground water to meet

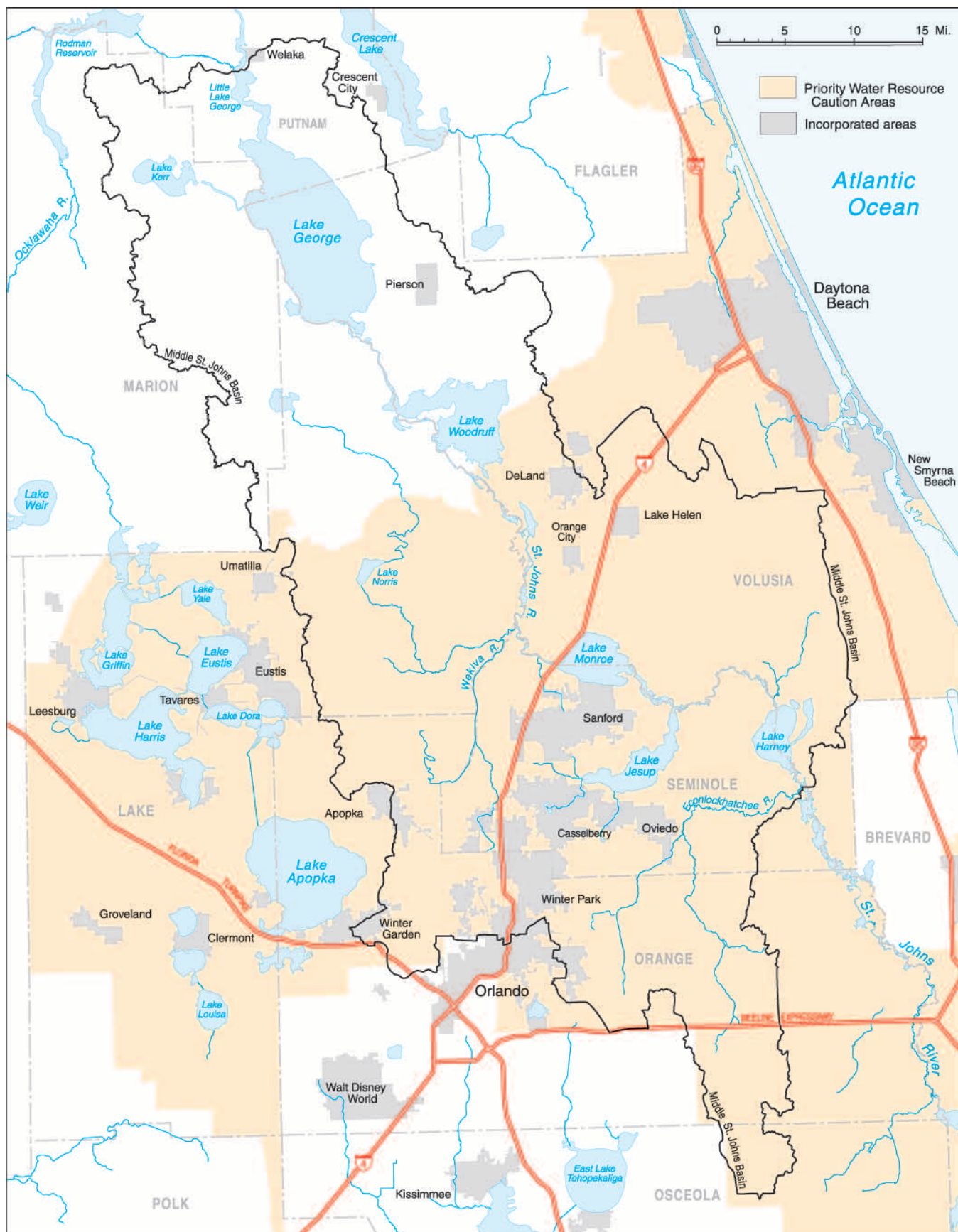


Figure 2.7: Portion of the Middle St. Johns Basin Included in the 1998 Priority Water Resource Caution Area

(Source: St. Johns River Water Management District)

projected 2020 demands in East-Central Florida (Vergara, 2000a). Investigations are under way to evaluate the use of the St. Johns River north of Lake Monroe as a water supply, through the East-Central Florida Water Supply Initiative. The St. Johns River may supply as much as 350 mgd of potable water (SJRWMD, October 7, 1999). Minimum flows and levels will also need to be developed to ensure that proposed water withdrawals will not harm the natural function of the St. Johns River. SJRWMD has established an advisory group to solicit input from the public and experts (SJRWMD, August 30, 2001).



Summary of Restoration Goals and Watershed Management Plans and Activities

This section summarizes historical, current, and proposed planning and watershed management activities and projects by major stakeholders to address water quality issues in the Middle St. Johns Basin. It also describes participatory decision-making processes in the basin. Chapter 3 provides more detail by planning unit. **Appendix C** contains a list of current and proposed projects and more detailed information about stakeholder groups in the basin.

Summary of Current Basin Planning and Management Activities

This section briefly outlines the active major management and restoration plans and programs in the Middle St. Johns Basin. It also includes a brief discussion of key stakeholder initiatives or activities related to water quality protection.

Middle St. Johns River SWIM Plan

A Surface Water Improvement and Management (SWIM) Plan for the Middle St. Johns Basin was first completed and approved by SJRWMD in 2002. The plan includes the Econlockhatchee River, Deep Creek, Lake Jesup, Lake Monroe, and Wekiva River planning units. It includes the portion of the St. Johns River from about Interstate 4 south through Lake Harney. A primary issue for the basin is the management of stormwater. The source for material in this section is the Middle St. Johns River Basin SWIM (SJRWMD, 2002a).

When the Florida legislature created SWIM in 1987, it directed the state's water management districts to design and implement plans and programs for the improvement and management of surface water (Section 373.451, Florida Statutes). The purpose of the Middle St. Johns SWIM Plan is to set forth a realistic course of action, identifying the projects and the effort needed to accomplish them, consistent with levels of SWIM funding.

SWIM goals specific to the Middle St. Johns Basin are as follows:

- To preserve natural and functional components of the ecosystem while restoring, where feasible, such conditions to the degraded portions of the system.

Lacustrine

A lake or pertaining to lakes; living or occurring on or in lakes.

- To preserve, or where necessary restore, the quantity and quality of water necessary to support thriving biological communities that contain appropriate diversities of native species in the riverine and **lacustrine** systems of the Middle St. Johns Basin.
- To pursue the development and implementation of stormwater management plans for each of the tributaries in the middle basin.

SWIM goals can be met in this basin with the implementation of the following four initiatives:

- Water quality enhancement emphasizing nutrient loading reduction and lake protection.
- Watershed master planning emphasizing the completion of sub-basin hydrologic models. Strategies for implementation include partnering with local governments to implement existing plans or to assist in the design and development of master plans where none exist.
- Stormwater retrofitting of areas built before 1983. The strategy is to design and implement a basinwide stormwater retrofit plan for the middle basin. SJRWMD initiated this strategy with the prioritization of stormwater retrofits needs in the Lake Jesup watershed.
- Compliance and rule enforcement of existing permitted stormwater systems.

An important complementary activity to this SWIM Plan is the acquisition of environmentally sensitive land through either existing land purchasing programs or development of a program targeted to meeting stormwater retrofit needs. The middle basin is a rapidly urbanizing area. Land acquisition provides a mechanism to meet SWIM goals and implement the four SWIM initiatives. In particular, land acquisition is a necessary component of stormwater retrofit and watershed master planning.

Numerous stormwater retrofit activities have been initiated and funded by special legislative appropriations over the past few years. Additionally, local governments have proposed a five-year plan for over \$150 million in capital improvements that will aid in stormwater management.

Appendix C lists water quality improvement projects in the basin.

Master Stormwater Management Plans

Phase 1 of the federal National Pollutant Discharge Elimination System (NPDES) stormwater program required municipalities with populations over 100,000 to obtain an NPDES stormwater permit, called an MS4 permit. A requirement of the MS4 permit is the development of a Master Stormwater Management Plan. Key elements that must be addressed by a stormwater management plan are structural, nonstructural, or source controls to reduce pollutants in runoff; identification and removal of illicit connections; monitoring and controlling pollutants in stormwater discharges from municipal industrial activities; and implementing and maintaining best management practices (BMPs) to reduce pollutant loads from construction sites.

Currently Seminole and Orange Counties and the city of Orlando have been issued MS4 permits in the basin. Co-permittees included under the

Orange County MS4 issued in April 1996 are the Florida Department of Transportation, Valencia Water Control District, and the cities of Apopka, Winter Park, Winter Garden, Ocoee, Maitland, Edgewood, Eatonville, and Belle Isle. The City of Orlando's MS4 permit was issued August 1, 1997. Co-permittees included under the Seminole County MS4 permit are the cities of Winter Springs, Sanford, Oviedo, Lake Mary, Longwood, and Altamonte Springs and the Florida Department of Transportation, District 5.

Many of the water quality improvement and restoration projects proposed for this basin are expected to address stormwater management issues as identified in the respective Master Stormwater Management Plan.

Clean Marina Program

Developed by the Department, Marine Industries Association of Florida, and Florida SeaGrant, the Clean Marina Program (CMP) has the goal of prevention. Marinas and boaters may not be aware of the environmental laws, rules, and jurisdictions with which they must comply. Participating facilities voluntarily agree to implement Marina Environmental Measures (MEMs), which are simple, innovative solutions to day-to-day marina operations that protect the environment. These MEMs have been developed through an examination of BMPs around the country and the partnership of Florida's marinas, boatyards, boaters, and government.

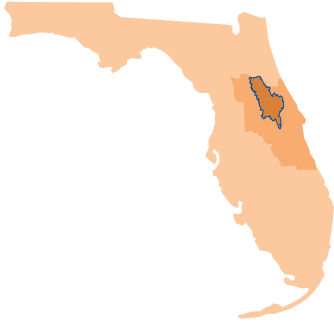
The CMP's Clean Marina Designation lets boaters who use marinas know that these businesses adhere to—or exceed—current regulatory requirements and want their activities to be environmentally conscious. The Department's Central District supports the CMP with a coordinator who provides participating facilities with technical support, compliance assistance, and training. Currently, there are no marinas designated as clean marinas in the Middle St. Johns Basin.

American Heritage River Program

The St. Johns River along with its watershed, with the exception of the portion of the basin in Representative Cliff Stearns' district, was designated an American Heritage River on July 30, 1998. The American Heritage Program is not a separately funded federal initiative, but rather a focusing of federal resources to identified priority areas. A major project focus has been the establishment of a St. Johns River Ecoheritage Corridor and encouragement of ecotourism in the basin.

The management structure comprises local advisory and steering committees. The Steering Committee's membership includes the executive director of SJRWMD, directors of the Department's Northeast and Central District Offices, mayor of the city of Jacksonville, a representative from each Advisory Committee, and local community members. Three advisory committees support the Steering Committee: one each for the Lower, Middle, and Upper St. Johns River. Membership on the Advisory Committee is determined through locally led processes and includes local government officials, the business community, the recreational community, historical/cultural interests, environmental organizations, and citizen representatives.





An employee of the U.S. Environmental Protection Agency (EPA), the sponsoring agency, has been named as the River Navigator. The River Navigator serves as a liaison between federal agencies and the Steering Committee.

Minimum Flows and Levels

Minimum flows and levels have been established for the Wekiva River, its headwater springs, and Black Creek. Headwater springs include Mes-sant, Seminole, Rock, Wekiva, Miami, Sanlando, Starbuck, and Palm Springs (Vergara, 2000b). Minimum flows and levels for a waterbody are defined as “the limit at which further withdrawals would be significantly harmful to the water resources or ecology of the area” (Section 373.042[1], Florida Statutes). Minimum flows and levels were needed to protect the discharge of the headwater springs in an effort to preserve the natural Wekiva system, including several endemic aquatic species (Hupalo et al., 1994).

Nongovernmental Stakeholder Groups

Numerous citizen or citizen-government groups with a primary interest in protecting or enhancing water quality are active in the basin. Most organizations have a specific geographic focus at either the watershed or waterbody level. These groups and their activities are as follows (Bess, 2002):

- **Watershed Action Volunteers:** The St. Johns River Water Management District and local governments sponsor the Watershed Action Volunteers Program to enlist volunteers to help monitor and protect north and central Florida’s water resources. Volunteers have assisted local governments in the basin with water quality and stormwater monitoring and river cleanups.
- **Clean Lakes Coalition of Central Florida:** The coalition’s mission is to educate homeowners about lake ecology. There are approximately 500 members in the coalition, which has been effective in convincing Orange County of the importance of formulating stormwater solutions.
- **Econlockhatchee River Basin Working Group:** This group, formed in late 1997 by the Department, has functioned largely as a forum for disseminating information in a nonadversarial atmosphere. Several environmental organizations, as well as local governments, St. Johns River Water Management District, and the Department, are represented.
- **Friends of Lake Jesup:** The group was created in the early 1990s to advance the restoration of the lake’s water quality, habitat, and navigation values. With support from local citizens’ groups, the Friends were formally recognized by the legislature in 1994 with the passage of the Lake Jesup Act. The act created the Friends of

Lake Jesup Restoration and Basin Management Task Force, with a designated membership and responsibilities, and provided funding to initiate projects. The act also directed the St. Johns River Water Management District to begin a specific set of projects to assess and restore Lake Jesup, along with the Department, FWC, Department of Transportation, environmental interests, local governments, and local homeowner associations. The Lake Jesup Act expired in 1998. Though its legislative directive has been completed, a non-legislative mandated advisory group continues to meet.

- **Friends of Maitland's Waterways:** The group's mission is to inform Maitland/Winter Park citizens of the BMPs that will improve water quality in their lakes. Its goal is to educate citizens by disseminating educational literature.
- **Friends of the Econ:** The group comprises local residents with an interest in maintaining the health of the Econlockhatchee River and encouraging land acquisition.
- **Friends of the Wekiva River:** This nonprofit organization works to preserve the beauty and natural functions of the Wekiva River ecosystem. The group identifies potential impacts to the river and works to minimize or eliminate them.
- **Little Wekiva River Technical Subcommittee:** The subcommittee, formed by the St. Johns River Water Management District in 1995, has a legislative mandate to direct state funding for projects in the Little Wekiva watershed. Membership comprises representatives from environmental organizations, the Department, water management district, local governments, and private citizens. The group has secured funding for riverbank stabilization projects, sediment removal, and stormwater retrofits.
- **Sweetwater Cove Tributary Surface Water Restoration Project Advisory Group:** Sweetwater Cove is a tributary to the Wekiva River that historically received wastewater. Excess sediment, nuisance vegetation, and poor esthetics are concerns. Sweetwater Cove received legislative funding in 2000 to address concerns, and the Sweetwater Cove Tributary Surface Water Restoration Project was initiated. An advisory group was formed to allow participation by stakeholders in the process. The advisory group comprises representation from local residents; the Department; Friends of the Wekiva; Utilities, Inc.; St. Johns River Water Management District; and Seminole County.
- **Wekiva River Basin Working Group:** The Wekiva River Basin Working Group was initiated by the Department and has been meeting since 1994. Membership in the group is composed of the Department, St. Johns River Water Management District, Lake





County, Seminole County, Orange County, Altamonte Springs, Division of Forestry, Fish and Wildlife Conservation Commission, and the U.S. Army Corps of Engineers. A major accomplishment of the group was the development of a master mitigation list for use by permitting agencies and local governments.

- **Volusia County Environmental and Natural Resources Advisory Committee:** The committee's membership includes Volusia County staff and members of the community.

Summary of Active Projects

This section summarizes current and proposed major projects to improve and restore water quality in the Middle St. Johns Basin. Most of these projects are directed toward stormwater retrofits. **Appendix C** provides details of active projects in the basin.

• Deep Creek Planning Unit

- Through Volusia Forever, land acquisition for water resource protection and recreation, including source water (drinking) protection.
- Through Volusia County Environmental, Cultural, Historic, Outdoor (ECHO) Program, environmental, cultural, historic, and recreational capital projects are funded.
- Through the Volusia County Conservation Corridor Program and cooperation of large landowners, the creation of a north-south conservation corridor through the center of the county.
- A small lot acquisition program in Volusia County targeted for plated flood prone areas.

• Econlockhatchee River Planning Unit

- Comprehensive master planning by Orange and Seminole Counties in the Little Econlockhatchee watershed.
- Comprehensive master planning for the Econlockhatchee River and its watershed.
- The construction of a regional stormwater facility for the East Orlando and Azalea Park Canals.
- The construction of a pollution abatement and flow attenuation facility in the Crane Strand watershed in Orange and Seminole Counties.

• Lake George Planning Unit

- Through Volusia Forever, land acquisition for water resource protection and recreation, including source water (drinking) protection.
- Through Volusia County ECHO, environmental, cultural, historic, and outdoor recreation capital projects.

• Lake Jesup Planning Unit

- Demonstration and implementation projects that include assessing the lake's circulation patterns, establishing nutrient goals or pollution load reduction goals, and reducing stormwater nutrient loads.

- The mapping and analyzing of lake sediments.
- A 1,300-acre wetland restoration project.
- Sediment dredging and removal.
- Nutrient load reductions in water discharged from Lake Nina.
- Improved stormwater storage in Lake Waunatta.
- An aquatic plant revegetation planting plan in Lake Jesup.
- The construction of a box culvert along S.R. 46 and Lake Jesup to reconnect the lake's floodplain and provide a crossing for wildlife.
- The removal of levees at the Lake Jesup Conservation Area and the North Lake Jesup Conservation Area to reconnect 3,682 acres of wetlands to the lake.
- A subdivision stormwater retrofit program for Seminole County.
- The removal of the S.R. 46 causeway over Lake Jesup and the elevation of a new bridge.
- The construction of a 6.4 acre wet detention pond with associated control structures north of Sand Dollar and the regrading of a segment of the Navy Canal.
- The construction of a four-acre wet detention facility for Cameron Ditch.

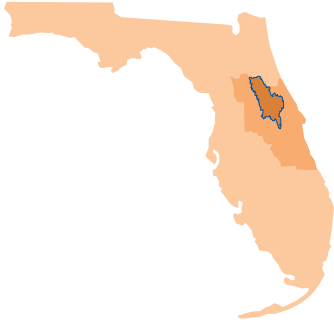
- **Lake Monroe Planning Unit**

- The development of minimum flows and levels for the Middle St. Johns River near S.R. 44 in Volusia County.
- Master plans for several watersheds, including the Midway, Sanford, and Lake Monroe watersheds.
- The development of a Watershed Management Plan for the city of Deltona.
- The development and implementation of a flood forecast system for the southern portion of the Middle St. Johns Basin, especially the Lake Monroe watershed.
- Remediation projects to improve surface water quality and quantity and solve flooding problems.
- The installation of a water quality baffle box and improvements to the secondary drainage system at Cameron Avenue.
- The design and construction of a retention pond, the replacement and upsizing of several culverts and cross-drains, and regrading and sodding of some of the ditches in the Brisson Avenue drainage area.
- In the First Drive area, the design and construction of a retention pond/sedimentation basin, the upsizing of several cross-drains, and regrading and sodding some of the ditches.
- The construction of a 20-acre regional stormwater retention pond serving the Celery Avenue area.

- **Lake Woodruff Planning Unit**

- Through Volusia Forever, land acquisition for water resource protection and recreation, including source water (drinking) protection.
- Through Volusia County ECHO, environmental, cultural, historic, and outdoor recreation capital improvement and restoration projects.





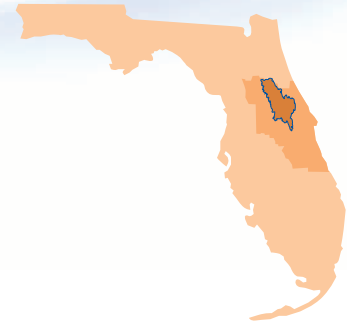
- **Wekiva River Planning Unit**

- In the Little Wekiva watershed, the development of a master plan for erosion control and projects to address bed and bank stabilization and sediment removal.
- The restoration of part of the Little Wekiva River's stream channel and the removal of 1,700 linear feet of pipe used to channel the river during the 1970s.
- The development of master plans, including stormwater retrofit projects, for the Orange and Seminole Counties portions of the Wekiva River watershed.
- The purchase of environmentally sensitive lands or restoration lands in the Wekiva River watershed.
- A number of ecosystem/water quality improvement projects in the Wekiva watershed, including the restoration of the STS site on the Wekiva River, an erosion control project in Wekiwa Springs State Park, Tram Road removal in the Wekiva Basin GEOPark, and possibly some additional land acquisition.
- The retrofit of a stormwater treatment system known as the Votaw Road Pond that drains into the Wekiva Basin GEOPark.
- Restoration work in the Sweetwater Oaks/Cover Lake tributary to the Wekiva River.
- The design and construction of surface water restoration projects listed in the Little Wekiva River Watershed Management Plan.

Chapter 3: Water Quality Evaluation by Basin Planning Unit

Chapter Summary

This chapter summarizes the current status of surface water quality in the planning units of the Middle St. Johns Basin. The primary purpose of evaluating the status of surface water quality is to determine if individual waterbodies or smaller drainage basins identified with a unique waterbody identification (WBID) number are potentially impaired. These waters, which must meet specific thresholds and data sufficiency and data quality requirements in the impaired surface waters rule (Identification of Impaired Surface Waters Rule, Section 62-303, Florida Administrative Code), will be listed on the state's planning list of potentially impaired waters.



The chapter also includes, for each planning unit, information on permitted discharges and land uses, ecological issues of concern, and current and planned restoration and protection projects to address water quality problems.



Section 303(d) Listed Waters

Section 303(d) of the federal Clean Water Act requires states to develop lists of surface waters that do not meet applicable water quality criteria and develop total maximum daily loads (TMDLs) for listed waters on a prioritized schedule.

This chapter presents a preliminary assessment of surface and ground water quality in the Middle St. Johns Basin. It summarizes concentrations of key water quality indicators (such as nutrients, chlorophyll *a*, dissolved oxygen [DO], and microbiological parameters) for the basin, with summaries provided for each planning unit and waterbody segments within planning units, as appropriate. The report also notes, where applicable, surface water quality criteria that have been exceeded and graphically summarizes report findings, noting potentially impaired waterbodies. The results of this preliminary assessment will be used to prioritize strategic monitoring activities in Phase 2 of the watershed management cycle.

Permitted discharges and land uses, ecological status, and current and planned surface water and ground water projects and activities such as facility upgrades and stormwater retrofits are also summarized for each planning unit. The final section of this chapter discusses water quality and pollutant loading rates on a basinwide scale. The chapter includes information from a wide variety of readily available data sources, including the U.S. Environmental Protection Agency (EPA), the Department, and the Florida Department of Health (DOH). Some qualitative information is also included.

Once monitoring is completed in Phase 2 of the watershed management cycle, an additional, more detailed assessment will be completed for the Middle St. Johns Basin that will include a use attainment assessment for basin waters. This assessment will serve as the basis for the Section 305(b) water quality assessment (a requirement under the Clean Water Act). It will also include a verified list of impaired waters, which, upon adoption by the Department's Secretary, will be submitted to the EPA as the 303(d) list for the basin (see the sidebar on Section 303[d] listed waters).

The most recent 303(d) list from the states was required by the EPA in 1998. The 1998 303(d) list provided by Florida included a number of waterbodies in the Middle St. Johns Basin (**Table 3.1**). The next update of the 303(d) list for this basin is scheduled to be issued in Summer 2003.

Nonpoint Source Pollution and Management

Improperly designed onsite sewage treatment and disposal systems (OSTDS) are a potential source of impairment for both ground water and surface water in the Middle St. Johns Basin. DOH tracks OSTDS counts through county health departments. While new systems are entered into the tracking system, there currently is no way to efficiently track their abandonment, such as when sewerage occurs in an area. An anticipated new DOH computer system is expected to track this additional information in the future. Four counties—Osceola, Marion, Lake, and Putnam—were not included in this evaluation of the numbers of OSTDS present. These counties have comparatively small land areas and limited development in the Middle St. Johns Basin. The Osceola area, at the southern tip of the basin, consists of wetlands. Most of the Marion County area is in the Ocala National Forest, as is about a third of the Lake County

Table 3.1: List of 1998 303(d) Waters in the Middle St. Johns Basin

WBID	Waterbody	Waterbody Type	1998 303(d) Parameters
Alexander Springs Planning Unit			
2918B	Buck Lake	Lake	Coliforms
Deep Creek Planning Unit			
2925	Deep Cr-Lk Ashby Canal	Blackwater	Silver, Cadmium, Coliforms, Lead, Iron
2964A	Lake Harney	Lake	Silver, Cadmium, DO, Nutrients, Fish Consumption Advisory–Mercury
Econlockhatchee River Planning Unit			
2991	Econlockhatchee River	Stream	Fish Consumption Advisory–Mercury
2991A	Econlockhatchee River	Stream	Coliforms, DO, Fish Consumption Advisory–Mercury, Nutrients, Lead, BOD
3001	Little Econlockhatchee	Stream	Coliforms, DO, Nutrients, BOD
3014	Crane Strand Drain	Stream	DO, Nutrients, BOD
3030	Long Branch	Stream	Coliforms, DO, Nutrients, Iron, BOD, Turbidity
Lake Jesup Planning Unit			
2981	Lake Jesup	Lake	Unionized Ammonia, Nutrients
2986	Soldier Creek Reach	Stream	Coliforms, DO, Nutrients, Lead
2994A	Gee Creek	Stream	Coliforms, Nutrients, Lead
Lake Kerr Planning Unit			
2899	Little Lake Kerr Outlet	Lake	Fish Consumption Advisory–Mercury
Lake Monroe Planning Unit			
2893C	St Johns River Ab Wekiva R.	Stream	DO, Nutrients, Lead, BOD, Total Suspended Solids
2893D	Lake Monroe	Lake	DO, Unionized Ammonia, Nutrients, Lead, Selenium
2962	Smith Canal	Stream	Coliforms, DO, Nutrients, Iron, Turbidity
2981A	Lake Jesup Nr St. Johns River	Lake	DO, Nutrients
Lake Woodruff Planning Unit			
28933	Volusia Blue Spring	Spring	Nutrients
2893Z	St Johns River Ab Lake George	Stream	DO, Nutrients, Total Suspended Solids
Wekiva River Planning Unit			
2929A	Blackwater Creek	Stream	Cadmium, DO, Nutrients, Lead, Iron, Selenium, Zinc
2956C	Wekiva Spring (Orange)	Spring	Coliforms, Nutrients
2967	Rock Springs Run	Spring	Coliforms, DO, Nutrients, BOD
2987	Little Wekiva River	Stream	Coliforms, Nutrients
2993	Lake Prevatt	Lake	Coliforms, DO, Nutrients
3004	Little Wekiva Canal	Stream	Coliforms, DO, Nutrients, BOD



area. The remainder of the Lake County area comprises rural and small, developed areas. Very little of Putnam County is in the basin, with Welaka being the largest developed area.

Most of Seminole County is in the Middle St. Johns Basin. The OSTDS count reported by DOH headquarters is 37,943. The Seminole County Health Department confirms that this figure is very close to the actual numbers. The total number of systems in the county is increasing each year, although not rapidly. The increase is relatively slow because the number of new installations per year (approximately 400 to 500) is almost cancelled out by the abandonment of systems (approximately 300). Most of the developed areas in the county, including all or portions of Sanford, Oviedo, Lake Mary, Longwood, Altamonte Springs, Casselberry, and Winter Springs, are sewered. Failure rates in Seminole County are around 1 to 2 percent. The failures are not centered in any particular location in the county. Many of the currently reported failures are for systems that are about 20 years old, not at all an unusual or unexpected situation (Cochrane, April 2002).

The portions of Volusia County that are in the Middle St. Johns Basin do not include the “metropolitan” area of Daytona Beach, New Smyrna, Port Orange, and Edgewater. The basin, however, does include the developed areas of DeLand, Pierson, Orange City, Lake Helen, Deltona, and DeBary. The Volusia County Health Department estimates that the middle basin contains 38,000 OSTDS. To put that number into perspective, the DOH headquarters’ figure for the entire county is 87,302 OSTDS. According to county health department information, Volusia County was in the top 10 Florida counties in terms of systems installed each year through the 1990s (Volusia County Health Department, 1999).

The county health department’s Environmental Health Division prepared an objective report for the county on the issue of central sewers versus onsite systems (Volusia County Health Department, 1999). It used a set of indexes to come up with numerical ratings for more than 100 subcommunities in the county. The indexes included permeability, type of nearby surface waters, age, water table, type of water supply, and density. Because each subcommunity has unique characteristics and histories, these factors also were considered when evaluating wastewater management options. Virtually the entire county was surveyed and assessed. The report addressed nearly 90 subcommunities. With the publication of the report, there was no intention on the part of the health department to imply the development of any sewerage plan for the county. The report is to be viewed as one of the tools to be used in making informed decisions about providing services to citizens and protecting public health. (**Note:** It is for reference purposes only.) The report’s recommendations were as follows:

- The Volusia Bar Fish Camp on Lake George was a high priority for sewers due to environmental concerns. Continuation of the septic system was considered unacceptable. Because it would have been too costly to extend a sewer line from Astor, it was thought that an onsite central package treatment plant would be the best solution.

- The Spring Hill area is one of DeLand's older neighborhoods. Some parcels were platted in the 1920s. While a portion of this area is connected to the city's municipal sewer system, a substantial area of densely populated, smaller lots is not connected. Most of this area is developed and contains single-family residences on central city water. Because most of the areas surrounding Spring Hill had been served by sewers, this area became a service "island" without central sewers. The health department recommended sewerage.
- Daytona Park Estates is a relatively large subdivision on the east side of DeLand with lots platted between 1955 and 1958. Though not all lots were built on at the time of the evaluation, those that were supported a large population already, all on private wells. Though soils vary, because much of the area is wet with a high water table, mounded septic tank systems were being installed. Central sewerage for the area was recommended.
- To the west of DeLand are the Hontoon and North Shell Road areas (State Road [S.R.] 44 crosses the northernmost of the two areas). Developed in the 1950s, they are mostly served by DeLand community water. Most of the soils in these areas have a high water table, and some land has been declared wetlands. The relatively large lots support high-density development due to their proximity to Lake Beresford and the St. Johns River. Many parcels are waterfront lots adjacent to the lake, the river, or canals that empty into the river. Within these areas, sanitary sewers served only a small portion, known as Quail's Roost. The health department recommended sewerage the remainder of the areas.
- On DeLand's west side, sewerage extended only to Boundary Avenue at the time of the survey and assessment. City water was provided to the community west of Boundary Avenue, but not sewer service. A large number of the urban parcels are small and densely populated. Plats date back as far as the mid-1920s. Beyond this area, development is less extensive and has remained mostly agricultural. The urbanized older area was recommended for sewerage.
- DeBary is a city with quarter-acre lots and private wells. Septic system repairs require mounded and/or filled systems to improve functioning. If the area were served with central water, the assessment index number would improve, but the strong recommendation for sewers probably would not change because hookups to central water cannot be mandated.
- Similarly, Deltona has quarter-acre lots, but with central water. Repairs also require mounds and/or filling because of a high water table, particularly in the area around the intersection of Saxon and Providence Boulevards. The health department strongly recommended sewerage for this community. In Deltona south of Osteen





Impaired Surface Waters Rule

The impaired surface waters rule (Identification of Impaired Surface Waters Rule, Section 62-303, Florida Administrative Code) defines the threshold for determining if waters should be included on the state's planning list and verified list of impaired waters. The rule addresses specific chemical parameters, nutrient impairment with numerical water quality criteria, biological impairment, fish consumption advisories, or ecological impairment.

Potential impairments are determined by assessing whether a waterbody or segment meets the criteria for inclusion on the planning list. The criteria for the planning list are less stringent than the criteria for the verified list. Once a waterbody is on the planning list, additional data and information will be gathered and examined to determine if the water should be included on the verified list or if additional data collection is needed to make that determination.

Road, lots are typically a half-acre or larger. Houses here are also served by city water. Because flooding is not uncommon in the Stone Island area, the health department strongly recommended central sewerage. This would be complicated by the fact that the Stone Island sewerage system is already at capacity.

Much of Orange County's development is served by sewer systems. About half of the county is in the Middle St. Johns Basin. Most of the basin's development is in the Orlando, Winter Park, and Maitland areas, all primarily served by sewers. Other large developments in the county, but outside the basin, include the remainder of the city of Orlando, Edgewood, Belle Isle, Windermere, Apopka, Ocoee, Winter Garden, Lake Buena Vista, and the Walt Disney World properties. The number of OSTDS installations estimated for the entire county is 99,851 (DOH, 2002).

Surface Water Quality

The Status Report provides a starting point for evaluating water quality by identifying waters that may not meet their designated uses (see **Noteworthy** on Florida's surface water quality classifications in Chapter 2). These waters are considered potentially impaired and are therefore included on a planning list for verification of impairment through further study. To be placed on the planning list, waters must meet specific thresholds for data sufficiency and data quality contained in the state's impaired surface waters rule (IWR) (see the sidebar). This rule, developed in cooperation with a Technical Advisory Committee, provides a science-based methodology for identifying impaired waters. Waters on the planning list will be prioritized for additional monitoring in Phase 2 of the watershed management cycle to verify whether they are, in fact, impaired and should be included on the state's 303(d) list of waters that are impaired.

In addition to identifying potentially impaired waters, the Status Report contains a list of the pollutants associated with impairments. There is no attempt, however, to identify the specific sources of potential impairments. Information on the sources of impairment will be developed in subsequent phases of the watershed management cycle, including total maximum daily load (TMDL) development and implementation.

Attainment of Designated Use

All surface waters of the state have been classified according to their designated use, 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 category)**

Following EPA guidance, the IWR uses a different nomenclature when evaluating the attainment of designated uses, as follows:

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

These four water quality attainment groups have been aligned with the state's designated uses, and thresholds have been established for each group as the criteria or data apply to the state's water classification system.

Integrated Report Categories and Assessment Overview

In 2002, the EPA released guidance called the Integrated Water Quality Monitoring and Assessment Report, referred to as the Integrated Report, which merges the states' reporting requirements under the Clean Water Act for the Section 305(b) surface water quality reports and Section 303(d) lists of impaired waters (Wayland, November 19, 2001). Future assessment reports produced by the Department will serve as basin-specific 305(b) reports.

Following the EPA's guidance for the Integrated Report, with some modifications, the Department has identified waterbodies or waterbody segments in each of the state's river basins based on a classification system developed by the U.S. Geological Survey (USGS). These waterbodies or segments have been grouped into five major assessment categories (**Table 3.2a**).

This Basin Status Report contains a preliminary evaluation of waterbodies that fall into Categories 1 through 3 in the table. The integrated water quality assessment model is used to identify for each segment with a WBID number the status of data sufficiency, the potential for impairment, and the need for TMDL development.

There are 361 WBIDs delineated in the Middle St. Johns Basin. Of that number, 193 were evaluated: 69 fall into Categories 1 and 2 (proposed for delisting and/or future monitoring) and 124 fall into Category 3 (proposed for future monitoring). A complete listing of basin waterbodies and their assessment categories is contained in **Appendix J** and the assessment categories are displayed on the maps for each planning unit (**Figures 3.2 through 3.10**).

Because not enough recent data on chemistry, biology, and fish consumption advisories have been collected, currently only a few waterbodies or waterbody segments statewide fall into Category 1. There are no Category 1 waterbodies in the Middle St. Johns. Similarly, not enough data are available to assess the attainment of designated uses in many waterbod-



Table 3.2a: 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	This indicates a waterbody or segment is potentially impaired for one or more designated uses. Future monitoring will be recommended 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	This indicates that a waterbody or segment exceeds verified list screening 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 evaluated and the waters have not been formally verified as impaired. Further monitoring and analysis may be necessary.
4a	Impaired for one or more designated uses but does not require TMDL development because a TMDL has already been completed	After a TMDL for the impaired waterbody or segment is approved by EPA, it will be included in a Basin Management Action Plan 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 impairment is not caused by a pollutant	This category includes waterbodies or segments that are degraded because of pollution (e.g., stream channelization, other hydrologic modifications, etc.), rather than specific pollutants.
4c	Impaired for one or more designated uses but does not require TMDL development because a pollution control measure will improve water quality to meet standards	Reasonable assurance must be provided that the pollution control measure will be implemented and that it will be effective in attaining standards and restoring the designated use(s) of the waterbody in the future.
5	One or more designated uses are 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 U.S. Environmental Protection Agency as Florida's 303(d) list of impaired waters at the end of Phase 2.

ies statewide. In particular, fish tissues in many waterbodies statewide have not been tested for mercury.

Many of the basin's waterbodies were classified as Category 2, because monitoring programs can sometimes provide sufficient data for partially determining whether a designated use in a particular waterbody is obtained.

However, most waterbodies in the state fall into Category 3. In the Middle St. Johns Basin, the breakdown of WBIDs in Category 3 is as follows:

- 168 WBIDs for which no data are available to determine their water quality status (Category 3a);
- 16 WBIDs with some data, but not sufficient data for making any determinations (Category 3b);
- 27 WBIDs that are potentially impaired based on the Planning List criteria (Category 3c); and
- 81 WBIDS that may be impaired based on the verified list criteria but that require further evaluation (Category 3d).

Many Category 3d waters 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 WBID to be listed as impaired. Sometimes these conditions cannot be linked to a causative pollutant, and sometimes they may reflect natural background conditions.

Classification of waters as Categories 4 and 5 is not appropriate during this phase of the watershed management cycle. In accordance with the IWR, determination of Categories 4 and 5 waters will occur during the next phase of the watershed cycle when waters are verified as impaired.

Impaired Waters Rule Methodology

To determine the status of surface water quality in the Middle St. Johns Basin, three categories of data—chemistry data, biological data, and fish consumption advisories—were evaluated to determine potential impairments. The main source of water quality data was information stored in the EPA's **STO**rage and **RE**Trieval (STORET) database (see the sidebar on STORET). Other sources included the Department's Biology Database (SBIO); data from Orange, Lake, Seminole, and Volusia Counties, other local governments, and St. Johns River Water Management District (SJRWMD); and fish consumption advisory and beach closure information from DOH. Water quality data are summarized in **Appendices H** and **I**.

Chemistry Data

The chemistry data from STORET used in this evaluation were also used for preparing the state's 2000 305(b) report. The stations were determined to be ambient surface water quality stations, and water quality



STORET

*STORET, the EPA's Oracle-based **STO**rage and **RE**Trieval database, is used to store the nation's biological, chemical, and physical water quality data for ground water and surface water. Scientists have stored water quality data in STORET for over 30 years. In Florida, federal, state, local, and interstate agencies; universities; contractors; laboratories; and volunteer organizations such as LakeWatch and the Bream Fisherman's Association submit data to STORET. U.S. Geological Survey (USGS) data were included in the present report; however, that agency no longer uploads data to STORET and has removed all of its historical data from the database. STORET stations used in this assessment are listed in Appendix G.*



information from point sources or wells was purposely excluded. Stations were classified as one of five waterbody types—spring, stream, lake, estuary, or blackwater—based on criteria described in the 305(b) report. The data included the following parameters:

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

The requirements for placing waters on the planning list include a minimum of 10 temporally independent samples from the period 1991 through 2000, unless there were 3 exceedances of a water quality criterion or 1 exceedance of an acute toxicity criterion in a 3-year period. 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 waterbody 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 IWR, 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 were 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 WBIDs, waterbody types, and parameters obtained through STORET data were conducted using Access, SAS 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, Florida Administrative Code. Chapter 62-303 (Identification of Impaired Surface Waters Rule) contains a table of sample numbers versus exceedances. A waterbody is placed on the planning list if there is at least 80 percent confidence that the actual criteria exceedance rate was greater than or equal to 10 percent.

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 µg/L or if annual mean chlorophyll *a* values increased by more than 50 percent over

historical values for at least 2 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 2 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.

Biological Data

Bioassessments were carried out for streams, lakes, canals, and rivers using the impaired surface waters rule as guidance. The Department's standard operating procedures, which provide definitions and specific methods for the generation and analysis of bioassessment data, are referenced in the individual bioassessment data tables included in **Appendix D**. The appendix summarizes the results of each bioassessment test used in assessments of potential impairments. **Tables D-1 through D-5** in the appendix contain the results of Stream Condition Index (SCI), Rapid Bioassessment (BioRecon), and Lake Condition Index (LCI) assessments; index thresholds; and selected results from artificial substrate analyses (Hester-Dendy analyses) in the basin.

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 Status Report, 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 Status Report. The data included sites designated as test and background sites for National Pollutant



Riparian

The bank of a river or stream.

Discharge Elimination System (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** 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 in this Status Report were obtained from the Department's 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 in Section 62-303.330, Florida Administrative Code.

The data from these databases were used without regard to the randomness of sample site selection. The general period of record for data used in the analysis of lotic (moving) waters was January 1, 1992, through December 31, 2001. The period of record for data used in the analysis of lentic (still) waters was June 21, 1995, through December 31, 2001. The June 21 date corresponds to the inception of the Department's current standard operating procedures for sampling lakes (FS-7640). For the purposes of this report, 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 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 are only provided for clear lakes (≤ 20 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 IWR.

Stream Condition Index

A total SCI score was calculated by adding the scores of the seven metrics in the method, i.e., 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 upon the total score constituted a failed bioassessment, based on the IWR. **Appendix D** contains 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 IWR.

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 Rule 62-302.530(11), Florida Administrative Code. One failure of the standard meant that a waterbody segment was listed as potentially impaired.

Fish Consumption Advisories

Fish consumption advisories were based on DOH’s “limited consumption” or “no consumption” advisories for surface waters because of high levels of mercury in fish tissue. Potential impairments identified for individual waterbodies in this assessment were based solely on these fish consumption advisory reports. Waterbodies with “limited consumption” or “no consumption” status were considered potentially impaired.

DOH advisories recommend that “limited consumption” fish species should not be eaten more than once a week by adults and not more than once a month by pregnant women, nursing mothers, women who intend to have children, and children under 15. These recommendations are based on a portion size of approximately one-half pound of fish. No consumption advisories are issued for fish containing average mercury levels exceeding 1.5 parts per million. For more information on mercury, contact your county health department or the DOH, Bureau of Epidemiology, at (850) 245-4401. Information can also be obtained at the Florida Fish and Wildlife Conservation Commission (FWC) Web site at <http://floridacconservation.org/fishing/health.html> and Florida State University’s Web site at <http://www.research.fsu.edu/researchr/fallwinter97/features/mercury.html>.

Limited fish consumption advisories have been in place since 1993 for elevated levels of mercury in largemouth bass, bowfin, and gar. The waterbodies affected are Lake Harney in the Deep Creek planning unit, the Econlockhatchee River in the Econlockhatchee River planning unit, Lake





PCB

PCBs are a group of chlorinated aromatic hydrocarbon chemicals with a structure based on a biphenyl ring with from 1 to 10 chlorine atom replacements within this ring structure. There are as many as 200 possible combinations of the biphenyl rings with chlorine (M. A. Ottoboni, 1991.)

Kerr in the Lake Kerr planning unit, and Lake Dorr in the Wekiva River planning unit.

Sediment Quality

Sediment quality at sites along the main stem of the St. Johns River including Lakes Monroe and George was evaluated (Durell et al., 1998) as part of a larger St. Johns River Water Management District-wide evaluation of metals and organic contaminants. Data were collected during 1996 and 1997. Additional detailed sediment studies were conducted on Lakes Monroe and George during 1998 (Durell and Fredriksson, 2000). Durell and Fredriksson found that relative to other sampling locations within the water management district the sum of polychlorinated biphenyls (**PCB**) congeners concentrations and PCB concentrations normalized to total organic carbon were the lowest for samples collected from Lake George. In contrast, sediments from five of seven Lake Monroe sites exceeded the effects range low levels (ERL) for DDT. ERLs were developed for marine sediments to indicate threshold concentrations above which contaminants could have possible occasional ecological and toxicological effects on aquatic life (Long et al., 1995). Canadian regulatory agencies developed threshold effect levels (TEL) for freshwater sediments that are comparable in value to the marine ERLs (Durell and Fredriksson, 2000). Several sediment samples from Lake Monroe were also found to have metals concentrations above the TEL.

Planning Units

Planning units help organize information and management strategies around prominent subbasin characteristics. Planning units were delineated by the SJRWMD with more modification by DEP. They represent either an individual large tributary watershed or a group of smaller adjacent tributary watersheds (as described in Chapter 2) with similar characteristics. A portion of the Wekiva River planning unit outside the SJRWMD boundary was added by DEP. The Department has adopted these planning units as a geographic basis for assessment, reporting, and planning activities under the watershed management approach, with one minor adjustment.

The SJRWMD has divided the Middle St. Johns Basin into nine planning units (Adamus et al., 1997): Alexander Springs Creek, Deep Creek, Econlockhatchee River, Lake George, Lake Jesup, Lake Kerr, Lake Monroe, Lake Woodruff, and Wekiva River. **Table 3.2b** lists these planning units, and **Figure 3.1** shows their locations and boundaries in the Middle St. Johns Basin.

For assessment purposes, the planning units have been further subdivided into subbasins or assessment units that are assigned unique WBID numbers.

Table 3.2b: List of Middle St. Johns Basin Planning Units

Planning Unit	Description
Alexander Springs Creek	Located in the Ocala National Forest in Lake and Marion Counties, this unit's main waterbody types comprise streams, lakes, and springs. The unit covers about 63,953 acres (100 square miles). Alexander Springs is a first-order magnitude spring. Alexander Springs Creek, which is west of the St. Johns River, flows east until meeting the river.
Deep Creek	Covering 175,454 acres (274 square miles), this unit lies within Volusia, Brevard, and Seminole Counties. Lakes and streams are the predominant waterbody types, with blackwater systems also present. Major waterbodies include Lake Ashby and Lake Harney. The Deep Creek and Lake Ashby tributaries connect to the St. Johns River in the southern portion of the unit.
Econlockhatchee River	Streams and lakes make up this unit, with the Little Econlockhatchee River, Mills Creek, Cowpen Branch, and Fourmile Creek comprising some of its main tributaries. Lying within Seminole, Orange, and Osceola Counties, it covers 173,142 acres (270 square miles) and is contained mostly within the west slope of the St. Johns River Valley.
Lake George	Lying within portions of Lake, Marion, Volusia, and Putnam Counties, the planning unit covers about 161,139 acres (252 square miles) and contains the state's second largest lake. Its principal waterbody types comprise lakes, streams, and springs. The St. Johns River flows through Lake George and exits the planning unit as the Ocklawaha River meets the St. Johns River. Major waterbodies include Price Creek and Jumping Gully Creek.
Lake Jesup	Comprising 92,808 acres (145 square miles) within Seminole and Orange Counties, Lake Jesup itself takes up 16,000 acres (including the lake's floodplain), covering about 20 percent of the total planning unit. Lake Jesup feeds the St. Johns River by an outlet channel located by the State Road 46 bridge and causeway (St. Johns River Water Management District, 2002). The planning unit includes both lake and stream waterbody types.
Lake Kerr	This planning unit contains lakes, stream, and springs as the main waterbody types. Its total area is about 120,498 acres (188 square miles). Lake Kerr, an Outstanding Florida Water (OFW), lies within the Ocala National Forest.
Lake Monroe	The planning unit, which includes lake and stream (many of the smaller features are ditches) waterbody types, covers 88,937 acres (139 square miles) and lies within Volusia and Seminole Counties. Major waterbodies include the Bethel Creek tributary and Konamac Lake.
Lake Woodruff	Lying within Volusia and Lake Counties, the planning unit covers about 176,782 acres (276 square miles). The St. Johns River flows through Beresford Lake, Lake Woodruff, and then to Lake Dexter before exiting the planning unit. The principal waterbody types are lakes, streams and springs.
Wekiva River	The dominant planning unit in the basin, its total area is 240,123 acres (376 square miles). Both the Wekiva and Little Wekiva Rivers are OFWs. Made up of blackwater, spring, lake, and stream waterbody types, this unit is protected by the 1988 Water Resources Protection Act. Major waterbodies include Lake Dorr, the Little Wekiva River, Rock Springs Run, and Blackwater Creek.

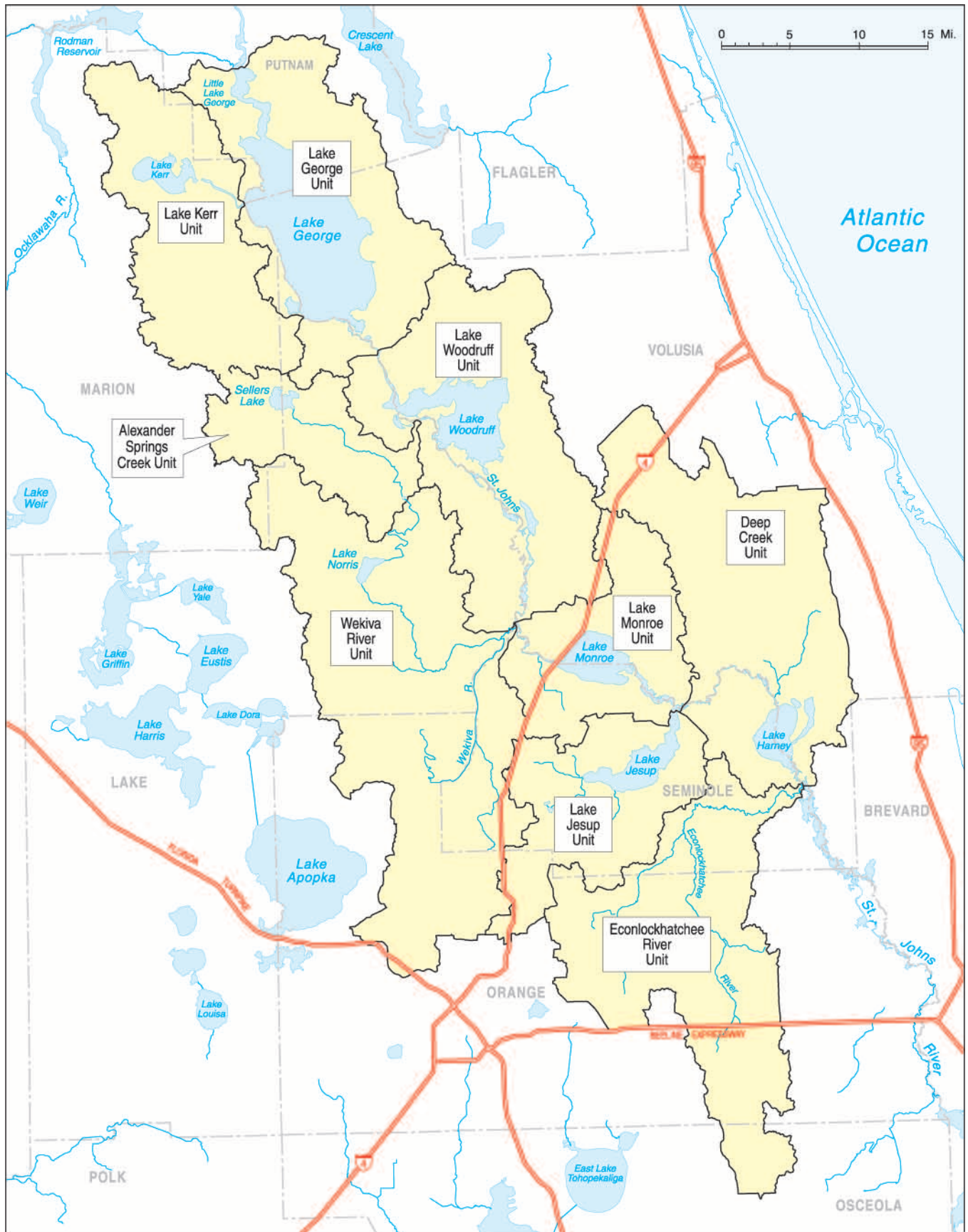


Figure 3.1: Locations and Boundaries of Planning Units in the Middle St. Johns Basin

Surface Water Quality Evaluation

• Alexander Springs Creek Planning Unit

General Description

The Alexander Springs Creek planning unit, in the Ocala National Forest, covers about 63,953 acres (100 square miles) and lies within portions of Lake and Marion Counties. Alexander Springs, for which the planning unit is named, is a first-magnitude spring discharging 94.2 cubic feet per second as of September 12, 2001 (Scott et al., 2002). Alexander Springs Creek flows east for approximately 8 miles until it meets the St. Johns River just south of Lake Dexter (Scott et al., 2002). Other major waterbodies include Buck Lake (for which the Buck Lake Wildlife Area is named), Akron Lake, and Sellers Lake.

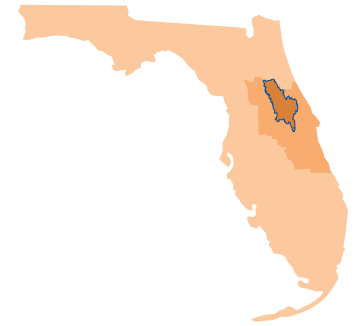
Water Quality Summary

Figure 3.2 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Alexander Springs Creek planning unit. There were 23 surface water quality monitoring stations used for analysis (**Appendix G**). **Table 3.3** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show only one potentially impaired waterbody. Buck Lake, the site of a national forest campground, was potentially impaired for fecal coliforms bacteria.

Point Sources

There are a total of four permitted point source discharges in the Alexander Springs Creek planning unit (see the sidebar for a definition of point sources). All of these are domestic wastewater facilities permitted for less than 0.100 million gallons per day (mgd), and none discharge to surface waters (not NPDES permitted). Permitted discharges range from 0.055 to .0900 mgd. The Country Squire Motor Home Vehicle is allowed the largest discharge, 0.055 mgd, into percolation ponds. The smallest allowed discharges are at Spring Creek Elementary School and the U.S. Naval Tracking Station. Each is allowed 0.0090 mgd and discharges into a drainage field and percolation pond, respectively. The only other facility is Alexander Springs Recreational Center, which discharges 0.0300 mgd into a drainfield. **Appendix E** lists, by planning unit, the permitted dischargers in the basin.

There are no other point source discharges in the planning unit.



Point Sources

Point sources contributing pollution 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, and delineated ground water contamination areas are also considered point sources for this evaluation, but are not included as part of the total number of permitted point sources. These sites have the potential to leach contaminants into ground water and surface water, but the impacts are difficult to quantify.

Table 3.3: Summary of All Causes of Potential Impairment in the Alexander Springs Creek Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
2918B	Buck Lake	Lake	Coliforms		

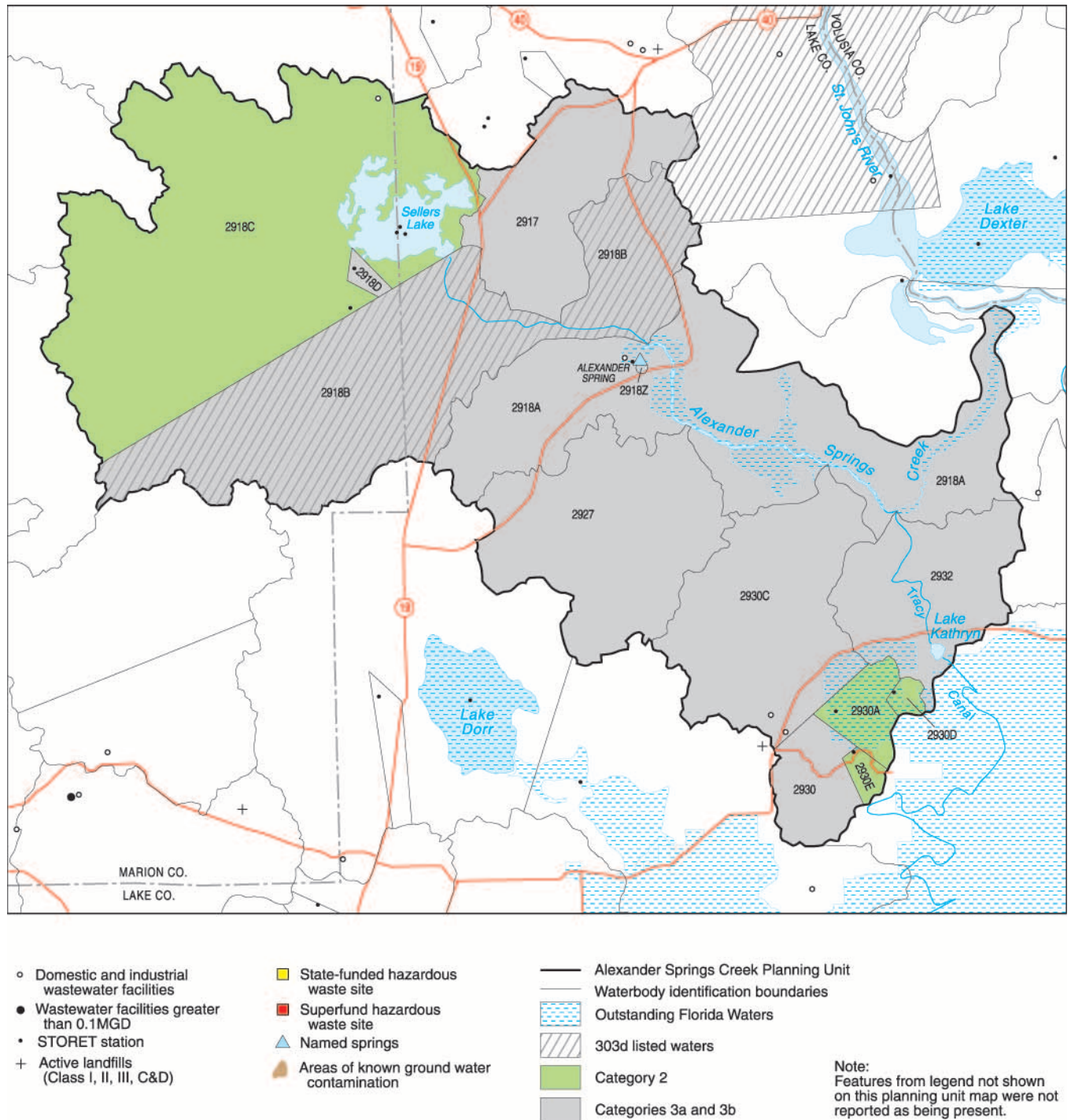


Figure 3.2: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Alexander Springs Creek Planning Unit

Land Use

Most of the Alexander Springs Creek planning unit is relatively undeveloped. Major land uses are upland forest (78 percent), wetlands (14 percent), and water (4 percent). Much of the planning unit's land area lies within the boundaries of the Ocala National Forest. Urban and built-up land accounts for less than 3 percent of the land area, and agricultural land use covers about 1 percent of the planning unit. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit (see the sidebar for a description of nonpoint sources of pollution related to land uses and **Noteworthy** for a description of atmospheric deposition).

The types of nonpoint pollutants in stormwater runoff vary depending on land use activities. Stormwater in urban areas typically contains fertilizers, bacteria, metals, sediments, and petroleum compounds. In agricultural areas, the major contaminants are fertilizers, bacteria, sediments, and lesser amounts of metals. Septic tanks, another common nonpoint source of pollution, contribute nutrients and bacteria to ground and surface waters.

Ecological Resources

Two rare and imperiled aquatic species occur in this planning unit. The dense hydrobe snail (*Aphaestracon pyncus*, Thompson) is found in Alexander Springs Run in the Ocala National Forest. The bluenose shiner (*Pteronotropis welaka*) has also been observed in Alexander Springs.

Planning and Management Activities

Most of the planning unit lies in the Ocala National Forest. There are currently no water quality improvement or management initiatives.

• Deep Creek Planning Unit

General Description

Covering 175,454 acres (274 square miles), the Deep Creek planning unit lies within portions of south Volusia, northwestern Brevard, and northeastern Seminole Counties. Major waterbodies include Lake Ashby and Lake Harney. Lake Ashby lies north of Lake Harney, and the Lake Ashby Canal connects the two lakes. The Deep Creek and Lake Ashby tributaries connect to the St. Johns River to the south (SJRWMD, 2002a). Volusia County operates a park on Lake Ashby that includes camping facilities, picnic areas, and a boardwalk (SJRWMD, 2002a). The planning unit is largely undeveloped (SJRWMD, 2002a).

Water Quality Summary

Figure 3.3 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Deep Creek planning unit. Water quality data from 30 monitoring stations were used for assessment (**Appendix G**). **Table 3.4** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show six potentially impaired waterbodies.

Major parameters of concern in Lake Ashby and the Deep Creek/Lake Ashby Canal waters are iron and lead. Deep Creek has a Water Quality Index (WQI) rating of 45.7, considered fair (URS, 2001).

Nonpoint Sources

Rain that falls on land generates stormwater runoff, which flows over the land surface and through the ground, carrying nonpoint source pollution from many different sources to the lakes, streams, rivers, and bays in a watershed. Nonpoint sources also include atmospheric deposition and leaching from agricultural lands, urban areas, and unvegetated lands. In many areas, these sources are the major cause of surface water and ground water pollution.

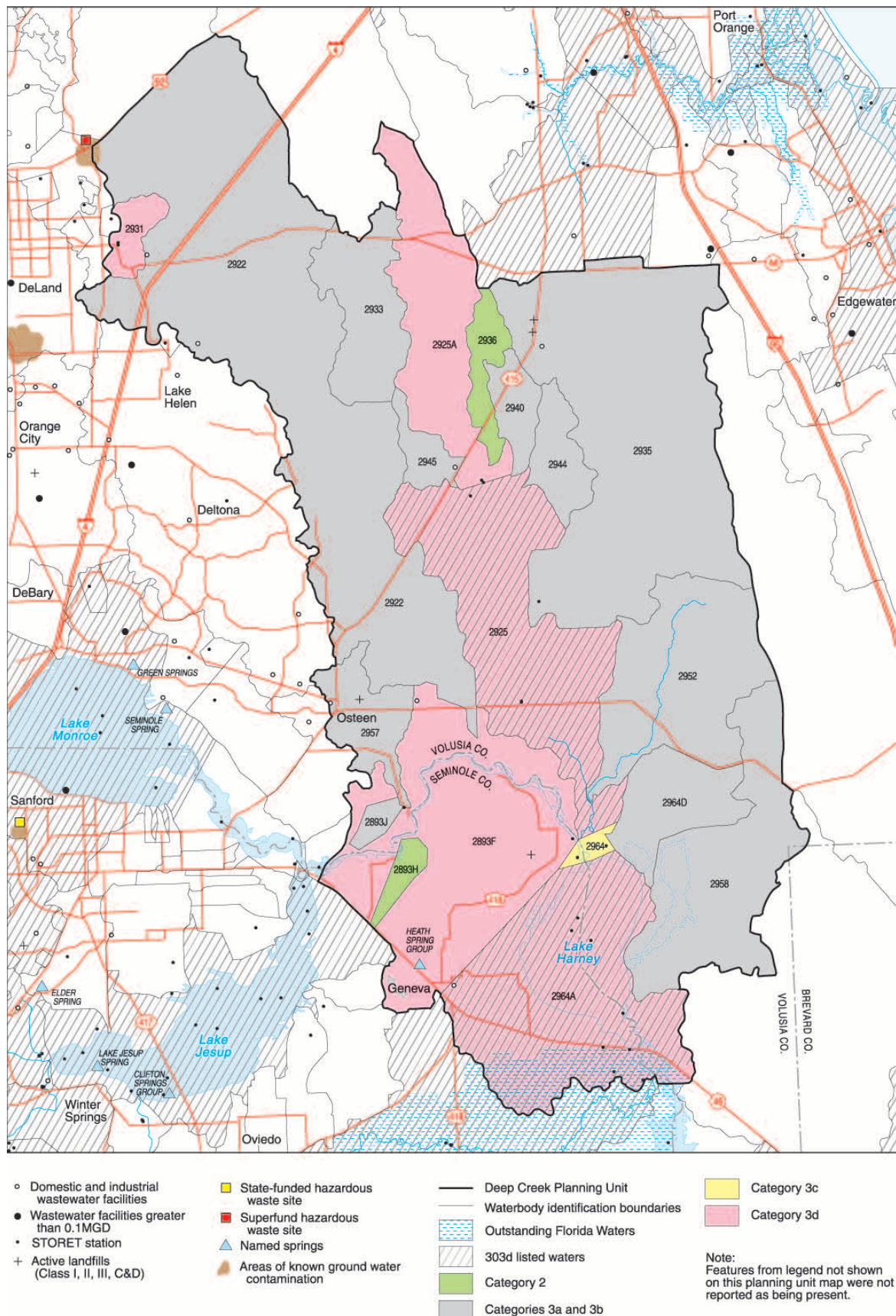


Figure 3.3: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Deep Creek Planning Unit

Table 3.4: Summary of All Causes of Potential Impairment in the Deep Creek Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
2893F	St. Johns Riv Ab Lk Jesup	Stream		DO, Nutrients	
2925	Deep Cr/Lk Ashby Ca	Blackwater	Silver, Lead, Cadmium, Coliforms, Iron	DO, Iron, Lead, Cadmium	Fecal and/or Total Coliforms
2925A	Lake Ashby	Lake		Iron, Copper, Lead	
2931	Lake Winnemissett Outlet	Lake		Lead, Selenium	
2964	Under Hill Slough	Stream		DO	
2964A	Lake Harney	Lake	DO, Nutrients, Cadmium, Silver, Fish Consumption Advisory–Mercury	DO, Nutrients, Fish Consumption Advisory–Mercury, Lead, Cadmium	

An increase in total phosphorus and a decrease in DO in the St. Johns River above Lake Jesup denote a decrease in water quality. This waterbody is potentially impaired for both DO and nutrients. Lake Harney has a lake water quality TSI rating of 60.0 (considered fair) and is listed as potentially impaired for nutrients and DO. DOH has issued a health advisory recommending limited fish consumption from Lake Harney.

Point Sources

There are seven permitted point source dischargers in the Deep Creek planning unit. All but one are domestic wastewater facilities, and none is a surface discharge permitted under NPDES. All the facilities use percolation ponds, except for one, Geneva Elementary School, which uses absorption fields. The discharges range from 0.0500 to 0.0085 million gallons per day (mgd). The domestic wastewater facility American Bioclean Residuals Management Facility, the largest discharger, currently discharges 0.500 mgd to the Samsula Canal–Sandy Drain watershed. The Lake Ashby Mobile Home Park discharges 0.0085 mgd of domestic wastewater into percolation ponds. The only industrial wastewater facility is Volusia County Utilities Department/Southwest Barn/Equipment and Truck Wash Recycle System, which discharges an unknown amount into the Lemon Bluff Ditch. **Appendix E** lists, by planning unit, the permitted dischargers in the basin.

There is one active Class I solid waste landfill in the planning unit, as well as three active, three inactive, and one closed construction and debris landfills (see **Noteworthy** on environmental remediation). There is also one delineated ground water contamination area, pursuant to Chapter 62-524, Florida Administrative Code, Potable Water Well Permitting in Delineated Areas (see **Noteworthy** on delineated ground water contamination areas). This area is delineated for a mixture of metals and volatile organic chemicals.

Atmospheric Deposition

Atmospheric deposition on land or water, through “wet” or “dry” processes, can be a significant nonpoint source of pollution in a watershed. Wet deposition occurs when pollutants are bound in water droplets and fall out in rain or fog. Dry deposition occurs as particles settle from the air onto land and water. Both forms of deposition contribute large quantities of nutrients, heavy metals, and other chemicals to surface waters. In Florida, most air pollutants are from fossil fuel combustion, mainly power plants and motor vehicles. Waste incineration, sulfuric acid production, cement manufacturing, pulp and paper production, and the combustion of plant and

animal biomass are a few of the other significant sources of air pollutants. Natural sources of pollutants include lightning and emissions from vegetation.

The air pollutants of most concern in Florida are sulfur dioxide, nitrogen compounds, and mercury compounds. Sulfur dioxide has a role in forming acid rain, which contributes to the lowering of pH in waterbodies. Nitrogen compounds, which act as a nutrient, can cause eutrophication in nitrogen-limited waters and also contribute to acid rain. Eutrophication is a process by which a waterbody becomes rich in dissolved nutrients, often leading to algal blooms, low DO, and changes in community

composition. Eutrophication occurs naturally, but can be accelerated by human activities that increase nutrient inputs to the waterbody.

Mercury compounds bioaccumulate up the food chain and contaminate fish tissue. Other air pollutants such as cadmium and lead, polycyclic organic compounds, polychlorinated biphenyls, and dioxins are also of concern. Because atmospheric pollutants can travel hundreds or thousands of miles before settling on land or water, their sources may be global as well as regional and local.

Environmental Remediation

Environmental remediation activities cover a broad spectrum of cleanup programs. These include state-managed hazardous waste, dry cleaning, and petroleum cleanup programs; as well as the federal Superfund and Resource Conservation and Recovery Act (RCRA) programs. These programs are designed to remediate ground water and soil contamination that pose a threat to public health and the environment. Site location information for petroleum cleanup and other waste cleanup activities is currently being updated.

The National Priorities List (NPL) is a comprehensive list

of the uncontrolled hazardous waste sites that pose the greatest threat to public health or the environment. Sites are placed on the NPL upon the completion of a preliminary assessment, site inspection, and hazardous ranking system evaluation to determine their potential for adverse impacts and priority for corrective action. The U.S. Environmental Protection Agency's (EPA) Superfund Program administers the cleanup of NPL sites. Under the federal Superfund law, states are required to provide 10 percent matching funds for site remediation. The Department's Water Quality Assurance Trust

Fund is the source for the state's matching funds.

The Department's state-funded cleanup program administers the cleanup of contaminated hazardous waste sites when enforcement action against a responsible party is unsuccessful or when no responsible party is identified. The Department's Water Quality Assurance Trust Fund is the main source of funds used to assess and remediate the soil and water contaminated at these sites.

Delineated Ground Water Contamination Areas

The Department's Delineation Program was established in 1988 in response to the discovery of ground water contaminated by ethylene dibromide (EDB), a soil fumigant that was used in 38 counties to control nematodes in citrus groves and row crops. The program has since expanded to include ground water contaminated by other pesticides, industrial solvents, and nutrients. The coverage of delineated areas in this program does not include, nor is it intended to include, all sources of contaminated ground water in Florida. The Delineation Program is designed to ensure

the protection of public health when consuming potable ground water supplies and to minimize the potential for cross-contamination of adjacent ground water resources. The program is regulated under Chapter 62-524, Florida Administrative Code, New Potable Well Permitting in Delineated Areas.

The Delineation Program's primary responsibilities are to:

- delineate areas of known ground water contamination;
- develop corresponding maps identifying these areas;
- implement a water well construction permitting/

application process that requires stringent water well construction standards; and

- require well water testing after completion of the water well to ensure the potable quality of the water source.

Any newly constructed water wells in delineated areas, and existing water wells found to be contaminated, are remediated by installing granular activated carbon filters or by connecting the user to a public water supply system.

Land Use

Upland forest (33.6 percent) and wetlands (36.3 percent) cover more than two-thirds of the Deep Creek planning unit, combined. Agriculture and rangeland occupy 8.9 percent and 6 percent of the total land area, respectively. Urban and built-up areas only comprise 7.7 percent of the planning unit. According to the Middle St. Johns River Reconnaissance Report (URS, 2001), the vast majority of the planning unit is undeveloped. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

The Middle St. Johns River Reconnaissance Report (URS, 2001) summarizes some of the nonpoint source issues in the planning unit. Lake Harney currently assimilates much of the total nitrogen, phosphorus, and suspended solids carried by stormwater runoff from Orlando. Development pressures are evident, with the city of Deltona planning to annex several thousand acres of commercial and industrial land use. In addition, transportation improvement concepts are being evaluated that include paving Maytown Road and building new east-west roadways across Volusia County. New and improved roads will add to development pressure and associated nonpoint source contamination.

Ecological Resources

The rare and imperiled blueback herring (*Alosa aestivalis*) has been observed in the Lake Harney portion of the St. Johns River (Hoehn, 1998).

Planning and Management Activities

Several programs are under way to preserve and protect lands in the Deep Creek planning unit. These include Volusia Forever, Volusia County Conservation Corridor, Small Lot Acquisition Program, Scrub Jay Habitat Preservation Program, and the Environmental, Cultural, Historic, Outdoor Program. Volusia County is conducting surface water monitoring in its portion of the Deep Creek planning unit. EnviroNet, a program run by Volusia County, uses volunteers to carry out a number of activities, ranging from marking stormdrains to assisting in restoration efforts. **Appendix C** summarizes restoration and protection efforts in the basin, by planning unit.

• Econlockhatchee River Planning Unit

General Description

The Econlockhatchee River planning unit lies within portions of Osceola, Orange, and east Seminole Counties. Totaling 173,142 acres (270 square miles), it is contained mostly in the west slope of the St. Johns River Valley. The planning unit is characteristic of blackwater systems in that it drains large areas of marsh, which color the water with organic compounds. The predominant waterbody is the Econlockhatchee River, which is approximately 36 miles long. Major tributaries to the Econlockhatchee River include the Little Econlockhatchee River, Mills Creek, Silcox Branch, Mills Branch, Long Branch, Hart Branch, Cowpen Branch, Green Branch, Turkey Creek, Little Creek, and Fourmile Creek. In 1992 the Environmental Regulation Commission designated the Econlockhatchee River as a





“Special Waters” OFW in accordance with Section 62-302.700(5), Florida Administrative Code. The planning unit also contains numerous small, shallow lakes.

Water Quality Summary

Figure 3.4 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Econlockhatchee River planning unit. Water quality data from 78 monitoring stations were used for assessment (**Appendix G**). **Table 3.5** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show 19 potentially impaired waterbodies.

The upper portion of the Econlockhatchee River has largely remained undeveloped, with limited water quality problems. The Econlockhatchee River drains marshy areas with naturally occurring high organic and low pH and DO levels.

The Little Econlockhatchee River, in contrast, drains the highly developed urban areas of Orlando and its suburbs. Parts of the original watercourse have been extensively channelized, and for many years the Little Econlockhatchee was the receiving water for much of the sewage effluent from the Orlando metropolitan area (URS, 2001). The Little Econlockhatchee River was placed on the 1998 303(d) list of impaired waters for DO, coliform bacteria, nutrients, and biochemical oxygen demand (BOD). It was also potentially impaired for biology, copper, and lead under the impaired surface waters rule. In addition, the segment of the Econlockhatchee River below the confluence with the Little Econlockhatchee River is on the 1998 303(d) list for potential impairment for DO, coliforms bacteria, lead, BOD, and mercury (based on fish consumption advisories).

Another stream, Crane Strand Drain, was potentially impaired for DO, nutrients, BOD, and biology. Bithlo Branch was also potentially impaired for biology. Long Branch, which flows into the Econlockhatchee near Bithlo, is potentially impaired for coliforms, DO, nutrients, iron, BOD, and turbidity.

Eight lakes in the planning unit are potentially impaired, mostly for nutrients and/or lead. Mills Branch at Lake Mills failed a bioassessment in 1999 and is potentially impaired for biology.

Point Sources

In the Econlockhatchee planning unit, there are 35 total known permitted point source dischargers. Of these, 21 are domestic wastewater facilities, 9 are industrial wastewater facilities, 3 are concrete batch plants, and 1 is a petroleum cleanup site. Nine are NPDES-permitted facilities, which may also supply part of their discharge for reuse. Nineteen facilities are permitted to discharge 0.100 million gallons or less per day. The two largest dischargers are domestic wastewater treatment facilities. The Orlando/Iron Bridge PFC is permitted to discharge 40 million gallons per day (mgd): approximately 20 mgd to constructed wetlands and the remainder to the St. Johns River. The Orange County Utilities Division (OCUD)/Easterly Subregional Wastewater Treatment Plant is permitted to discharge 6.2 mgd of highly treated effluent into a combined natural



Table 3.5: Summary of All Causes of Potential Impairment in the Econlockhatchee River Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
2991	Econlockhatchee River	Stream	Fish Consumption Advisory–Mercury	DO, Fish Consumption Advisory–Mercury, Copper, Lead, Cadmium	
2991A	Econlockhatchee River	Stream	DO, Coliforms, Nutrients, Lead, BOD, Fish Consumption Advisory–Mercury	DO, Fish Consumption Advisory–Mercury, Copper, Lead, Silver, Cadmium	Nutrients, Fecal and/or Total Coliforms
3001	Little Econlockhatchee	Stream	DO, Coliforms, Nutrients, BOD	DO, Total Coliforms, Biology, Copper, Lead	Nutrients
3003	Lake Pickett	Lake		Nutrients, Copper, Lead	
3003A	Mills Lake	Lake		Biology	
3014	Crane Strand Drain	Stream	DO, Nutrients, BOD	Biology, DO	
3019	Lake Tanner Outlet	Lake		DO, Nutrients, Copper	
3022	Bithlo Branch	Stream		Biology	
3023	Crane Strand	Stream		DO, Total Coliforms, Fecal Coliforms, Lead	
3023A	Lake Baldwin	Lake		Total Coliforms, Nutrients, Copper, Lead	
3023B	Lake Barton	Lake		Nutrients, Lead	
3024	Lake Downey	Lake		Nutrients, Lead, Copper	
3024A	Trib to Little Econ. River	Stream		DO, Total Coliforms, Lead, Fecal Coliforms	
3030	Long Branch	Stream	Coliforms, DO, Nutrients, Iron, BOD, Turbidity	DO	
3033	Unnamed Drain	Stream		Biology	
3033C	Lake Corner	Lake		Nutrients	
3033D	Lake Drawdy	Lake		DO, Nutrients	
3036	Lake Frederica	Lake		Nutrients	
3037	Unnamed Drain	Stream		DO, Biology	

and human-made wetlands system that provides further treatment before it flows into an unnamed tributary of the Econlockhatchee River. The remaining 12.8 mgd of effluent from the OCUD/Easterly plant goes to reuse systems, including cooling water for the Curtis H. Stanton Energy Plant. Other significant domestic wastewater dischargers include Alafaya Utility (1.1 mgd), which discharges to percolation ponds, and OCUD/University Shores (1.275 mgd), which discharges to the Little Econlockhatchee River. Industrial facilities with permitted discharges include car and truck wash facilities, concrete batch plants, and two ground water contamination remediation systems. These are all small discharges, with the largest, the Rexam Groundwater Treatment Facility, permitted to discharge 72,000 gallons per day. **Appendix E** lists, by planning unit, the permitted dischargers in the basin.

Wastewater reuse is significant in the Econlockhatchee River planning unit, with at least 31.15 mgd directed to reuse. The Orlando/Iron Bridge facility is the largest contributor, at 18.86 mgd.

Other contributors of point source discharges are two hazardous waste sites, which consists of one active Superfund site and one active state-funded site. There are also one closed Class I and one closed Class III solid waste landfills, as well as two closed construction and debris landfills. Pursuant to Chapter 62-524, Florida Administrative Code, Potable Water Well Permitting in Delineated Areas, four areas are delineated for ground water contamination, for a mixture of metals, volatile organic compounds, and pesticides.

Land Use

Extensive urbanization has occurred on the banks and channels of the Econlockhatchee River system, often in the floodplain. Urban runoff and the continuing effects of sediment load from previous wastewater effluent discharges affect the Little Econlockhatchee River (SJRWMD, 2002a). Approximately 25 percent of the land area in the planning unit is classified as urban and built-up, with an additional 2.7 percent occupied by transportation, communications, and utilities. Wetlands account for 26 percent of the land area. Agricultural land uses are also significant, with almost a quarter of the land area devoted to agriculture (12.7 percent) and rangeland (10.4 percent). Past agricultural use included citrus groves, many of which were destroyed by freezes during the 1990s. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

Ecological Resources

The Econlockhatchee River is characterized by a narrow border of significant wetlands, with pine flatwoods adjacent to the river corridor. The headwater area contains wetlands that are more expansive and flatwoods that are interspersed with agriculture, with small patches of hardwood forest and longleaf pine. Urbanization has resulted in the reduction of wetland and upland habitats throughout the Econlockhatchee River watershed. In response, special basin criteria have been adopted for the river and its tributaries; these currently serve as a model in Florida for buffering development on private properties along river systems (SJRWMD, 2001b).





Planning and Management Activities

Several projects have been initiated to address issues with the Econlockhatchee River. In partnership with the SJRWMD, Orange and Seminole Counties are finalizing their Little Econlockhatchee master plans. Efforts are already under way to begin the implementation of water quality and quantity retrofit systems. State, regional, and local governments are acquiring lands on the river to begin wetland restoration where possible. Local governments have identified stormwater retrofit programs to improve water quality and flood control in older developments constructed prior to state stormwater regulations. Plans for the Natural Resources Agricultural Learning Center on Long Branch Creek in Orange County are under way; the center will promote environmental preservation, reduction of development pressure, and educational outreach (URS, 2001). **Appendix C** summarizes restoration and protection efforts in the basin, by planning unit.

• Lake George Planning Unit

General Description

The Lake George planning unit, in portions of Lake, Marion, Volusia, and Putnam Counties, comprises 161,139 acres (252 square miles), with Lake George itself taking up 46,000 of these acres (72 square miles). Lake George is the state's second largest lake. The major waterbodies in the planning unit include Lake George, the St. Johns River above the Ocklawaha River, Price Creek, and Jumping Gully Creek. The U.S. Navy also used Lake George as a bombing range (Fitzgerald et al., 1988). The lands surrounding Lake George in Volusia County are now in the Lake George State Forest.

Water Quality Summary

Figure 3.5 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Lake George planning unit. Water quality data from 61 monitoring stations were used for assessment (**Appendix G**). **Table 3.6** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show four potentially impaired waterbodies.

Lake George is potentially impaired for low DO, elevated levels of nutrients, cadmium, selenium, and biology. Moderately eutrophic, the lake receives nutrient loading from both human-made and natural sources. Periodic algal blooms occur (Alvarez, Lehman, and Associates, 1991). This watershed is surrounded by metropolitan areas in the uplands of the west (Ocala) and to the south-southeast of the basin (Orlando and DeLand). Lake George is especially vulnerable to pollutants because the river water slows as it drains into the large, shallow lake, increasing the retention time of the water (Alvarez, Lehman, and Associates, 1991). Segments of the St. Johns River upstream and downstream of Lake George are also impaired for nutrients.

Point Sources

There are 14 total permitted point source dischargers in the Lake George planning unit. Of these, 12 are domestic wastewater facilities and

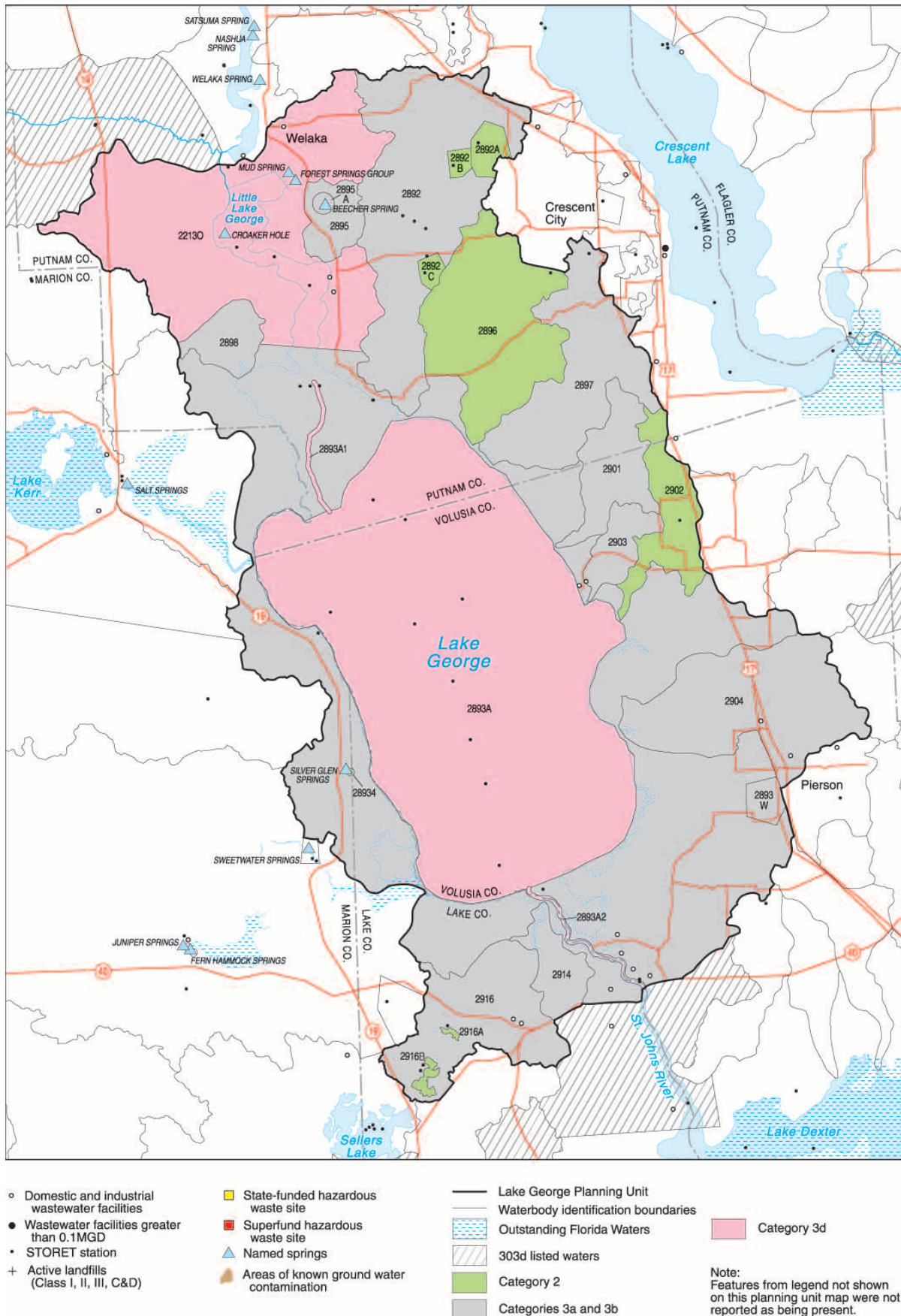


Figure 3.5: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Lake George Planning Unit

Table 3.6: Summary of All Causes of Potential Impairment in the Lake George Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
22130	St. Johns River Above Ocklawaha	Stream		Nutrients	
2893A	Lake George	Lake		DO, Nutrients, Cadmium, Selenium, Biology	
2893A1	St. Johns River Below Lake George	Stream		Nutrients	
2893A2	St. Johns River Above Lake George	Stream		DO, Nutrients	

2 are industrial wastewater facilities. Discharges range from 0.0990 to 0.0043 million gallons per day (mgd), and none is NPDES permitted. The facilities discharge to percolation ponds, drainfields, or holding ponds. The facility with the largest discharge is the Welaka Wastewater Treatment Plant (0.0990 mgd), which discharges into the St. Johns Basin above the Ocklawaha Basin. The facility discharging the smallest amount is the Pierson Laundromat (0.0043 mgd), an industrial wastewater source discharging into the Price Creek watershed. Another notable facility is River Park Utilities, discharging 0.025 mgd. This facility has its own reuse system.

Appendix E lists, by planning unit, the permitted dischargers in the basin.

Other contributors of point source discharges include one closed Class I and two closed Class II solid waste landfills, as well as one closed construction and debris landfill. There are no delineated areas pursuant to Chapter 62-524, Florida Administrative Code, Potable Delineated Water Well Permitting in Delineated Areas, and no Superfund or state-funded hazardous waste sites.

Land Use

Water (32.7 percent), upland forest (30.8 percent), and wetlands (21.6 percent) occupy most of the land area in the Lake George planning unit. Urban and built-up lands cover about 7 percent of the total land area, mostly concentrated around the town of Pierson, on the eastern side of the planning unit, or on the north shore of Lake George. Agriculture accounts for 5.4 percent of the total land area. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

Major pollution in the planning unit comes from urban and agricultural runoff. Specifically, the SJRWMD estimated that 2.3 million pounds of pesticides were used in 1988, with an unknown amount entering the St. Johns River just upstream of Lake George. It also has been suggested that leakage of old sanitary sewers could be contributing to water quality degradation. The St. Johns River, however, is probably responsible for the highest pollution loading into the basin (Alvarez, Lehman, and Associates, 1991).

Ecological Resources

The Lake George State Forest is one of several publicly owned tracts of land encircling Lake George. The St. Johns River borders three and a half miles of the forest and provides a wealth of ecologically valuable communities, as well as river-based recreation. The surrounding landscape of the forest contributes to water resource protection of the Lake George watershed and aquifer recharge. The Lake George region is also part of an extensive wildlife corridor that provides habitat and roaming areas vital to the survival of the local black bear population (*Ursus americanus floridanus*). Other wildlife that make their homes in the forest include bald eagle (*Haliaeetus leucocephalus*), sandhill crane (*Grus canadensis pratensis*), white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo silvestris*), bobcat (*Lynx rufus*), and gopher tortoise (*Gopherus polyphemus*). One of the largest concentrations of bald eagles statewide can be found around Lake George (Florida Fish and Wildlife Conservation Commission Bald Eagle Nesting Survey Data Layer, 2000). This cluster of bald eagle nests is one of 13 clusters statewide needed to ensure the survival of the species within Florida.

Rare and imperiled or unique species of fish and aquatic invertebrates occur in the planning unit. The endangered shortnose sturgeon (*Acipenser brevirostrum*) is thought by fishery biologists to have used the St. Johns River upstream to Lake George. The collection of shortnose sturgeon in recent years has been rare (Hoehn, 1998). Other rare and imperiled fish observed in the Lake George watershed are blueback herring (*Alosa aestivalis*) and bluenose shiner (*Pteronotropis welaka*) (Hoehn, 1998). The Silver Glen Springs crayfish (*Procambarus attiguus*) is found in Silver Glen Springs. Croaker Hole, a spring in the bed of the St. Johns River, is the primary thermal refuge for striped bass (*Morone spp.*) on the St. Johns River, although stripers may occur as far upstream as Lake Jesup (Cross, 1994).

Planning and Management Activities

The Lake George Restoration Project has been under way since 1997. Agencies involved include the Corps of Engineers, Florida Fish and Wildlife Conservation Commission, St. Johns River Water Management District, and the Department's Central District and its Bureau of Invasive Plant Management, as well as concerned residents and property owners. The project's goals include removing and preventing the accumulation of muck along the lake's shoreline and restoring and maintaining the health of the lake (Florida Department of Environmental Protection, 1991).

Appendix C summarizes restoration and protection efforts in the basin, by planning unit.

• Lake Jesup Planning Unit

General Description

The Lake Jesup planning unit is located in central Seminole County and extends into Orange County. It covers 92,808 acres (145 square miles), of which 16,000 acres comprise Lake Jesup (including the lake's open water and floodplain). Many communities, including the northern





metropolitan area of Orlando, are partially or wholly contained in the Lake Jesup planning unit.

An outlet channel by the State Road (S.R.) 46 bridge and causeway connects Lake Jesup to the St. Johns River. Other major waterbodies are Gee Creek, Soldier Creek, Howell Creek, and Sixmile Creek. The planning unit also contains many small, shallow ponds and lakes.

Water Quality Summary

Figure 3.6 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Lake Jesup planning unit. Water quality data collected from 241 sampling stations were used for assessment (**Appendix G**). **Table 3.7** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show 37 potentially impaired waterbodies in the planning unit. Of these, 29 are lakes, including Lake Jesup. The other lakes are mostly small urban lakes potentially impaired primarily by nutrients.

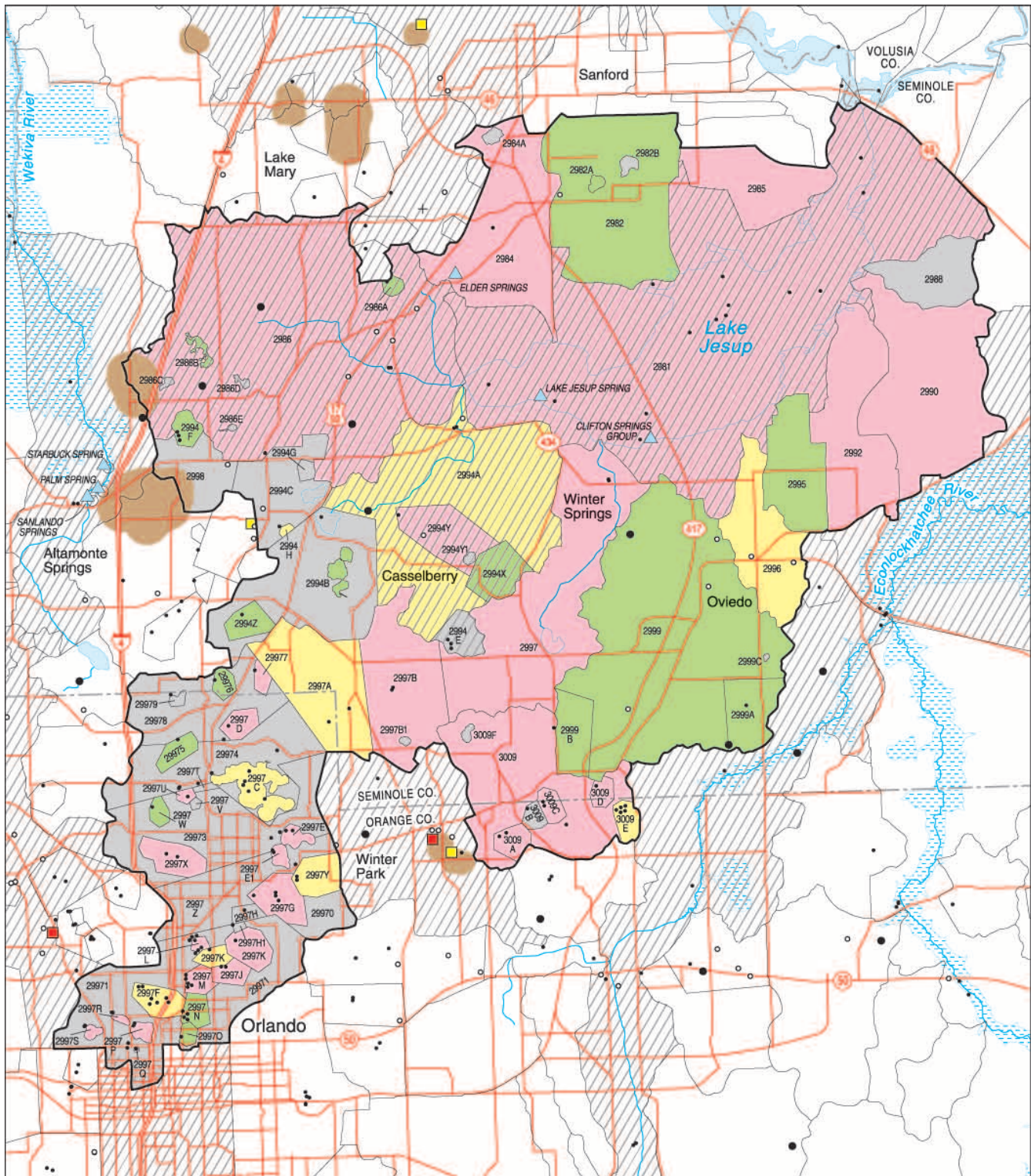
With excessive amounts of phosphorus, nitrogen, organic “muck” deposits, and declining fish numbers, Lake Jesup is a hypereutrophic lake, deficient of submerged aquatic vegetation (SJRWMD, 2002a). Additional problems such as poor lake circulation and nutrient and sediment loading have degraded water quality (URS, 2001). The S.R. 46 bridge and causeway constrict the single outlet channel connecting the lake to the St. Johns River, limiting the lake’s water circulation (SJRWMD, 2001a). Sediments have developed on the bottom of Lake Jesup due to years of discharged municipal wastewater and still may be a source of nutrient loading in the lake (URS, 2001). Overall, the lake’s water quality is poor, partly due to the inhibited circulation (URS, 2001).

Two creeks, Soldier Creek and Gee Creek, are potentially impaired for a variety of contaminants. Soldier Creek was placed on the 1998 303(d) list for coliforms, DO, nutrients, and lead, and under the IWR is additionally potentially impaired for silver. Gee Creek was included on the 1998 303(d) list for coliforms, nutrients, and lead, but is potentially impaired for fecal coliforms, lead, nutrients, and silver under the IWR. Sweetwater Creek is potentially impaired for biology, while a segment of Howell Creek has low DO and potential impairments from copper and lead. Many small, shallow lakes lie within the Lake Jesup planning unit. Twenty-seven of these lakes are potentially impaired primarily for nutrients.

Point Sources

There are 21 total permitted point source dischargers in the Lake Jesup planning unit. Of these, 11 are domestic wastewater facilities, 7 are industrial wastewater facilities, 2 are concrete batch plants, and 1 is a ground water treatment system at a petroleum contamination site. Four of the facilities are permitted under NPDES.

Five of the 21 facilities are permitted to discharge more than 0.100 million gallons per day (mgd). The largest discharge is the Seminole County Environmental Services/Greenwood Lakes domestic wastewater facility, which is permitted to release 3,500 mgd into Soldier Creek. Other major dischargers include the Winter Springs East wastewater treatment plant



- Domestic and industrial wastewater facilities
- Wastewater facilities greater than 0.1MGD
- STORET station
- + Active landfills (Class I, II, III, C&D)
- State-funded hazardous waste site
- Superfund hazardous waste site
- ▲ Named springs
- Areas of known ground water contamination

- Lake Jesup Planning Unit
- Waterbody identification boundaries
- Outstanding Florida Waters
- 303d listed waters
- Category 2
- Categories 3a and 3b

Note:
Features from legend not shown
on this planning unit map were not
reported as being present.

- Category 3c
- Category 3d

Figure 3.6: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Lake Jesup Planning Unit

Table 3.7: Summary of All Causes of Potential Impairment in the Lake Jesup Planning Unit (Based on the 1998 303[d] List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
2981	Lake Jesup	Lake	Unionized Ammonia, Nutrients	Unionized Ammonia, Nutrients, Lead	
2984	Lake Nann	Lake		Nutrients	
2985	Chub Creek	Stream		DO, Iron, Nutrients	
2986	Soldier Creek Reach	Stream	Coliforms, DO, Nutrients, Lead	Fecal Coliforms, Lead, Silver, DO, Nutrients	
2990	Salt Creek	Stream		Biology, DO, Iron, Nutrients	
2992	Sweetwater Creek	Stream		Biology, DO	
2994A	Gee Creek	Stream	Coliforms, Nutrients, Lead	Fecal Coliforms, Lead, Silver, Nutrients	
2994H	Lake Griffin	Lake		Nutrients	
2994Y	Fruitwood Lake	Lake		Nutrients	
2996	Sweetwater Creek	Stream		Biology	
29977	Lake in the Woods	Lake		Nutrients	
2997	Howell Creek below Lake Howell	Stream		Nutrients	
2997A	Howell Creek	Stream		DO, Copper, Lead	
2997B	Howell Lake	Lake		Nutrients	
2997C	Lake Maitland	Lake		Lead, Nutrients	
2997D	Lake Minnehaha	Lake		Nutrients	
2997E	Lake Osceola North	Lake		Nutrients, Copper, Lead	
2997E1	Lake Osceola South	Lake		Nutrients	
2997F	Lake Ivanhoe	Lake		Nutrients, Lead	
2997G	Lake Virginia	Lake		Nutrients, Copper, Lead	
2997I	Lake Sue	Lake		Nutrients, Lead	
2997J	Lake Rowena	Lake		Nutrients	
2997K	Lake Estelle	Lake		Nutrients	
2997L	Lake Winyah	Lake		Nutrients	
2997M	Lake Formosa	Lake		Nutrients	
2997P	Lake Concord	Lake		Nutrients	
2997Q	Lake Dot	Lake		Nutrients	
2997R	Lake Adair	Lake		Nutrients	
2997S	Lake Spring	Lake		Nutrients	
2997U	Lake Park	Lake		Nutrients	
2997X	Lake Killarney	Lake		Nutrients, Copper	
2997Y	Lake Mizell	Lake		Nutrients	
3009	Bear Gulley Lake	Lake		Nutrients	
3009A	Waunatta Lake	Lake		DO, Nutrients	
3009C	Lake Burkett	Lake		Nutrients	
3009D	Deep Lake	Lake		DO, Nutrients, Copper, Lead	
3009E	Lake Georgia	Lake		DO, Turbidity	

(WWTP) (2.01 mgd), Winter Springs West WWTP (1.55 mgd), and Casselberry WWTP (1.4 mgd). Three facilities are implementing a reuse plan, with at least 1.08 mgd being discharged for reuse. The three facilities with reuse programs are Florida Central Commerce Park, Winter Springs East WWTP, and Winter Springs West WWTP. **Appendix E** lists, by planning unit, the permitted dischargers in the basin.

Although there are no Superfund or state-funded hazardous waste sites in the planning unit, there is one closed Class I solid waste landfill. There are also two delineated ground water contamination areas pursuant to Chapter 62-524, Florida Administrative Code, Potable Water Well Permitting in Delineated Areas. These areas are delineated for ethylene dibromide (EDB).

Land Use

Land use in the planning unit is predominately urban and built-up (45 percent). Other major land uses are wetlands (19 percent), water (14 percent), agriculture (8 percent), and upland forest (7 percent). Range-land and transportation, communication, and utilities account for about 6 percent of land use, with less than 1 percent in barren land. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

For decades, Lake Jesup has received direct discharges of wastewater effluent and stormwater discharges from its tributaries. The lake presently receives urban runoff from Orlando, Winter Park, Casselberry, and Maitland and agricultural runoff from adjacent farms (SJRWMD, 2001a). Current and past land uses, which threaten the lake's waters with many sources of pollution, need to be carefully monitored (URS, 2001).

Ecological Resources

The Lake Jesup area is a winter sanctuary for migratory birds such as sandhill cranes (*Grus canadensis pratensis*). It also provides habitat for American alligators (*Alligator mississippiensis*), bald eagles (*Haliaeetus leucocephalus*), otters (*Lutra canadensis*), and osprey (*Pandion haliaetus*). It is an important nesting area for bald eagles (Florida Fish and Wildlife Conservation Commission Bald Eagle Nesting Survey Data Layer, 2000). Blue herons (*Ardea herodias*) use the lake's wetlands as rookeries (Florida Fish and Wildlife Conservation Commission Wading Bird Survey Data Layer, 1999).

The Clifton Springs hydrobe (*Aphaestracon theiocrenetum*), a brown snail, is found only in the spring run of this spring. Clifton Springs discharges into the south side of Lake Jesup.

Planning and Management Activities

The Lake Jesup Act was passed by the Legislature in 1994 and expired in 1998. Its intent was to direct the St. Johns River Water Management District along with other state and local agencies and governments and private citizens to begin a specific set of assessment and restoration projects for Lake Jesup. To further protect, preserve, remediate, and improve waters in the area, state, local, and regional agencies are implementing a number of restoration and management plans in the Lake Jesup planning unit.





These plans include the Lake Jesup Basin Evaluation Plan, Howell Creek Discharge Dredging (dredging of shore of Lake Jesup at Howell Creek), Lake Nina and Lake Waunatta Remediation for nutrient load reduction, Aquatic Vegetation Planting Plan, S.R. 46 Lake Jesup Box Culvert, Lake Circulation Analysis, Lake Sediment Analysis, Levee Removal on Lake Jesup to reconnect wetlands, Seminole County Stormwater Deficiency Correction Projects, Lake Estelle Interconnect Replacement (construction of open channel to replace culverts), and Seminole County Stormwater Retrofit Program (URS, 2001). **Appendix C** summarizes restoration and protection efforts in the basin, by planning unit.

• Lake Kerr Planning Unit

General Description

Located in portions of Lake, Marion, and Putnam Counties, the total area of the Lake Kerr planning unit is about 120,498 acres (188 square miles). Major waterbodies include Lake Kerr and Juniper Creek. Lake Kerr is an OFW. Predominantly undeveloped, the planning unit is within the Ocala National Forest.

Water Quality Summary

Figure 3.7 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Lake Kerr planning unit. Water quality data from 13 sampling stations were used for assessment (**Appendix G**). **Table 3.8** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show three potentially impaired waterbodies.

Parameters of concern for these three waterbodies are DO, zinc, and lead for Hopkins Prairie; copper, lead, selenium, and silver for Lake Kerr; and silver for Little Lake Kerr Outlet. Lake Kerr also has a limited fish consumption advisory (for elevated levels of mercury) for largemouth bass, bowfin, and gar.

Point Sources

The planning unit has three permitted point source dischargers. All are domestic wastewater discharges, and none is NPDES permitted. The largest discharge is 0.0850 million gallons per day (mgd) from the Salt Springs wastewater treatment plant, which discharges into percolation ponds. The smallest discharge is 0.0028 mgd, from the Fountain Center wastewater facility, which also discharges into percolation ponds. The Juniper Springs Recreational Area discharges 0.0190 mgd into the Juniper Springs watershed through drainfields. **Appendix E** lists, by planning unit, the permitted dischargers in the basin.

The planning unit has no Superfund or state-funded hazardous waste sites; no Class I, II, or III solid waste landfills and debris landfills; and no delineated areas under Chapter 62-524, Florida Administrative Code, Potable Water Well Permitting in Delineated Areas.



Figure 3.7: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Lake Kerr Planning Unit

Table 3.8: Summary of All Causes of Potential Impairment in the Lake Kerr Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
2899	Little Lake Kerr Outlet	Lake	Fish Consumption Advisory–Mercury	Fish Consumption Advisory–Mercury	
2899A	Hopkins Prairie	Stream		DO, Lead, Zinc	
2899B	Lake Kerr	Lake	DO, Nutrients	Copper, Lead, Selenium, Silver, Cadmium	

Land Use

The Lake Kerr planning unit is predominately upland forest (86 percent), with wetlands making up another 9 percent of land use. Water comprises 4 percent, and less than 2 percent is urban and built-up. Rangeland, barren land, and communications, transportation, and utilities make up less than 1 percent of land use, combined. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

Planning and Management Activities

Appendix C summarizes restoration and protection efforts in the basin, by planning unit.

• Lake Monroe Planning Unit

General Description

The Lake Monroe planning unit lies within northwestern Seminole and southwestern Volusia Counties. Its main waterbody is Lake Monroe. One of the 3 major lakes in the Middle St. Johns Basin, Lake Monroe is 6 miles long, 4 miles wide, and on average 7 feet deep. Covering approximately 11 percent of the total area of the planning unit, the lake's total size is 9,406 acres (URS, 2001). Classified as a "river run" lake, Lake Monroe consists of an enlargement of the St. Johns River that the river runs through. Major tributaries include Bethel Creek and the DeBary Drain (SJRWMD, 2002a). Other waterbodies include various segments of the St. Johns River and the northernmost portion of Lake Jesup, which is separated from the main body of the lake by a built-up causeway. Its water quality is distinctly different from the rest of Lake Jesup.

Water Quality Summary

Figure 3.8 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Lake Monroe planning unit. Water quality data from 105 sampling stations were used for assessment (**Appendix G**). **Table 3.9** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show six potentially impaired waterbodies.

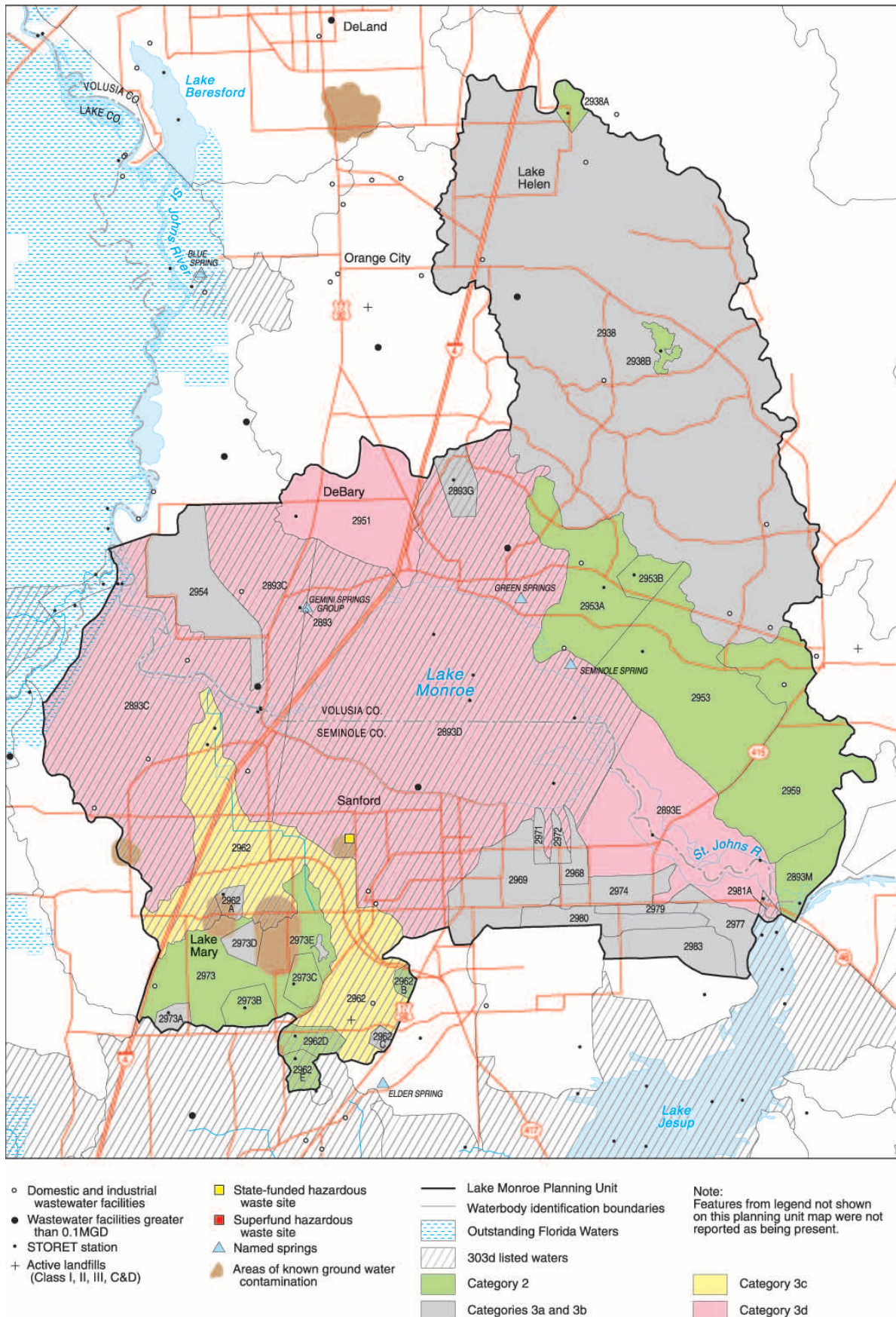


Figure 3.8: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Lake Monroe Planning Unit

Table 3.9: Summary of All Causes of Potential Impairment in the Lake Monroe Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
2893C	St. Johns Riv Ab Wekiva Riv	Stream	DO, Nutrients, Lead, BOD, Total Suspended Solids	DO, Nutrients, Biology	
2893D	Lake Monroe	Lake	DO, Nutrients, Lead, Selenium	DO, Nutrients, Selenium, Silver	
2893E	St. Johns Riv Ab Lk Monroe	Stream		DO	
2951	Lake Marie	Lake		Nutrients	
2962	Smith Canal	Stream	Coliforms, DO, Nutrients, Iron, Turbidity	Biology	
2981A	Lake Jesup Nr St Johns Riv	Lake	DO, Nutrients	DO, Nutrients	

Lake Monroe is a eutrophic lake with fair water quality. Parameters of concern include DO, nutrients, lead, unionized ammonia, selenium, silver, coliforms, iron, turbidity, total suspended solids, and BOD. Water quality in Lake Monroe has become more stable since 1997. Recent results have shown high levels of phosphorus and have produced fair to poor Water Quality Index and TSI ratings (URS, 2001).

Two segments of the St. Johns River also show potential impairment. The St. Johns River above the Wekiva River is potentially impaired for DO, nutrients, lead, BOD, and total suspended solids. The St. Johns River above Lake Monroe has low DO. The segment of Lake Jesup in the Lake Monroe planning unit is potentially impaired for DO. Smith Canal is potentially impaired for coliform bacteria, DO, nutrients, iron, biology, and turbidity.

Point Sources

There are 23 permitted point source dischargers in the Lake Monroe planning unit. Of these, 15 are domestic wastewater facilities, 5 are industrial wastewater facilities, 2 are concrete batch plants, and 1 is a petroleum cleanup facility. Five are NPDES permitted, and three are permitted to discharge more than 0.100 million gallons per day (mgd). The Florida Power and Light (FPL) Sanford Power Plant is permitted for the largest discharge, at 180 mgd. **Appendix E** lists, by planning unit, the permitted dischargers in the basin.

Four of the wastewater treatment facilities in the planning unit implement wastewater reuse, with at least 5.59 mgd discharged for reuse purposes. The sites permitted for these types of reuse are Deltona Lakes (domestic wastewater, permitted to 1.4 mgd, irrigation reuse), Sanford/North (domestic wastewater, permitted to 7.3 mgd, flow mostly to public reuse, with an allowable annual average surface discharge of 1.0 mgd), Twelve Oaks RV Resort (permitted to .025 mgd, reuse to two percolation

ponds), and Volusia County Utilities Department/Deltona North (domestic wastewater, permitted to 1.2 mgd, reuse for public irrigation and to percolation ponds).

The planning unit contains one active state-funded hazardous waste site, as well as one closed Class I, one closed Class II, and one active Class III solid waste landfills. There are also 11 delineated ground water contamination areas pursuant to Chapter 62-524, Florida Administrative Code, Potable Water Well Permitting in Delineated Areas. These areas are delineated for EDB and volatile organic compounds.

Land Use

While the majority of land use in the planning unit comprises wetlands (20 percent), water (17 percent), and upland forest (15 percent), another large portion consists of urban and built-up (35 percent). Agriculture accounts for 8 percent; rangeland, 3 percent; and barren land and transportation, communications, and utilities, 2 percent. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

The large proportion of urban and built-up land in the planning unit creates the potential for nonpoint source contamination. Historically, Lake Monroe has received untreated stormwater discharges (URS, 2001). Located in the area with the highest growth potential in Seminole County (SJRWMD, 2001b), the Midway portion of the planning unit is under development pressure. A master plan has been completed by Seminole County for this area. Although agricultural runoff into Lake Monroe has diminished, other direct runoff (e.g., fertilizer and roadway pollutants) continues to affect water quality. Presently, there are no treatment areas for road runoff in this area (SJRWMD, 2001b).

Ecological Resources

The wetland environment of the Lake Monroe planning unit provides many habitats for surrounding wildlife. Major development has been taking place, and efforts are being designed to preserve and protect lands that are currently undeveloped.

The blueback herring (*Alosa aestivalis*), a rare and imperiled fish, has been observed in Lake Monroe and the St. Johns River (Hoehn, 1998).

Planning and Management Activities

Many plans are being implemented to monitor, correct, and ultimately improve water problems. Local, county, and state governments are carrying out these plans, which include the Lake Monroe Basin Watershed Management Plan, Deltona Watershed Management Plan, Wastewater Reuse, Volusia-to-DeBary Trunkline, Sanford and Midway Basin Studies, Water Quality Enhancement Capital Program, Basin Deficiency Correction Program, Middle Basin Forecasting Model, and Scrub Jay Habitat Preservation Program. **Appendix C** summarizes restoration and protection efforts in the basin, by planning unit.





• Lake Woodruff Planning Unit

General Description

Volusia and Lake Counties bisect the Lake Woodruff planning unit, which drains 176,782 acres (276 square miles). Major waterbodies include Lake Woodruff and Lake Dexter. In the planning unit, the St. Johns River extends through Beresford Lake, Lake Woodruff, and Lake Dexter (URS, 2001). The St. Johns River makes up the western border of the 21,500-acre (33.5-square-mile) Lake Woodruff National Wildlife Refuge (West Volusia Audubon Society, 2001), which is completely contained within the planning unit. The typical landscape comprises freshwater marshland and swamp bordering the St. Johns River (U.S. Fish and Wildlife Service, 1997).

Water Quality Summary

Figure 3.9 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Lake Woodruff planning unit. Water quality data from 42 sampling stations were used for assessment (**Appendix G**). **Table 3.10** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show five potentially impaired waterbodies.

Four of these waterbodies are potentially impaired for DO. According to the data in **Tables 4.2a** and **4.2b** in Chapter 4, the majority of impairments, by mileage, are in the planning unit's streams. However, Lake Beresford is potentially impaired for nutrients, and Lake Woodruff is potentially impaired for DO. Volusia Blue Spring is listed as impaired for nutrients on the 1998 303(d) list (the only spring on the 303(d) list in the planning unit). The nitrate-nitrite concentrations increased from 0.11 mg/L to 0.264 mg/L between October 2000 and March 2001. Volusia Blue Spring received a SCI rating of 15 in October 2000 and a rating of 17 in March 2001; both ratings are in the "poor" range (FDEP, 2000–2001).

Point Sources

There are 34 permitted point source dischargers in the Lake Woodruff planning unit. Of these, 27 are domestic wastewater facilities, and 7 are industrial wastewater facilities. Only one is permitted under NPDES (Deland/Wiley Nash). The Deland/Wiley Nash facility (domestic wastewater) has a permitted capacity of 6.0 million gallons per day (mgd), but may only discharge 4.0 mgd into the St. Johns River. Four facilities are allowed to discharge more than 0.100 mgd. They are Volusia County Utilities Department (VCUD)/Southwest Regional (domestic wastewater, permitted to 0.544 mgd into a noncontributing area), Florida Power Corp DeBary (industrial wastewater permitted to 0.420 mgd), and VCUD/Four Townes (domestic wastewater, 0.300 mgd into a noncontributing area).

Appendix E lists, by planning unit, the permitted dischargers in the basin.

Two facilities in the planning unit have implemented reuse plans. These are Deland/Wiley Nash (domestic wastewater, permitted to 6.0 mgd, reuse for irrigation) and VCUD/Southwest Regional (domestic wastewater, permitted to 0.544 mgd, public access reuse). The total volume discharged

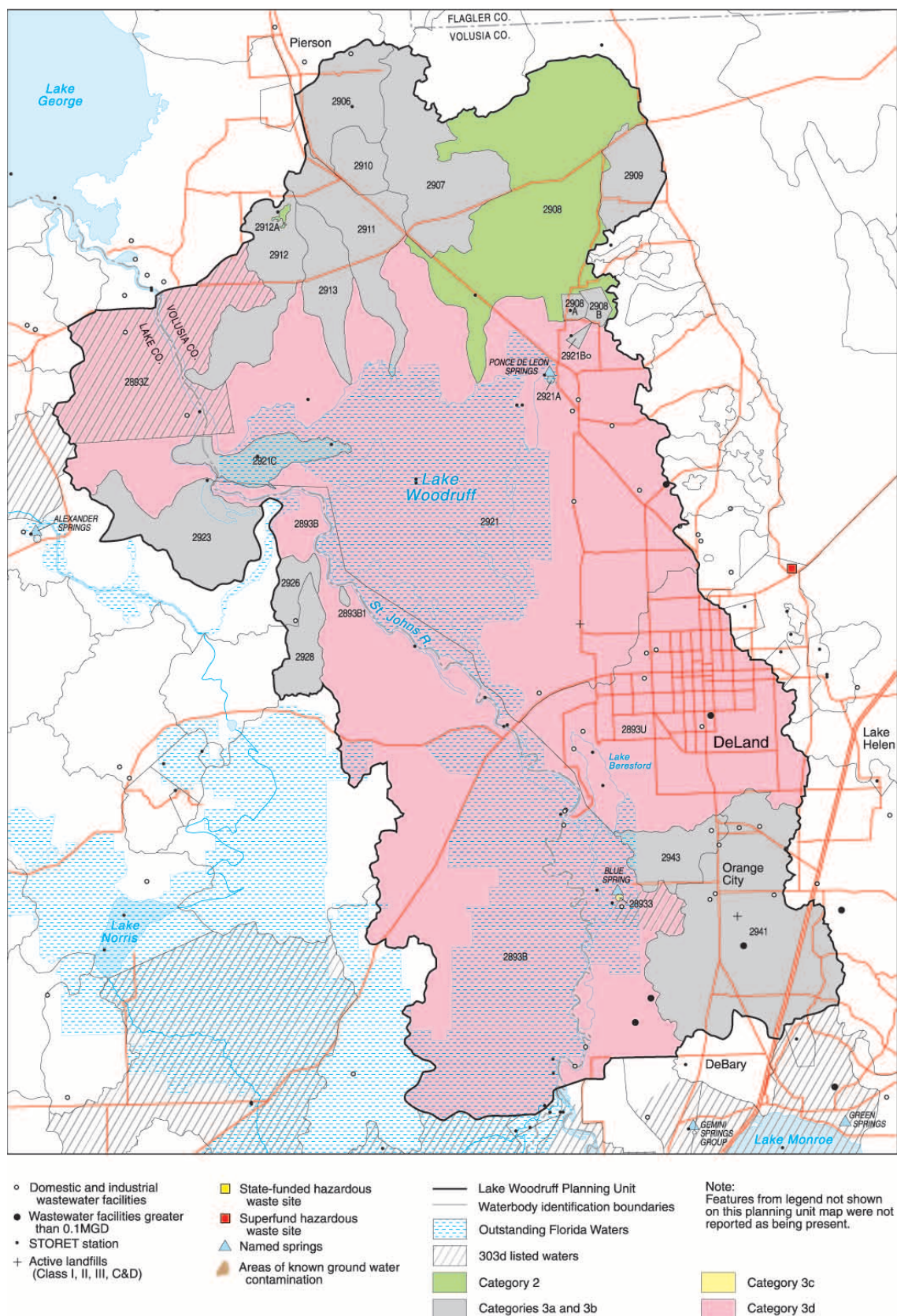


Figure 3.9: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Lake Woodruff Planning Unit

Table 3.10: Summary of All Causes of Potential Impairment in the Lake Woodruff Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
28933	Volusia Blue Spring	Spring	Nutrients	DO	
2893B	St. Johns Riv Ab Lk Woodruff	Stream		DO, Nutrients, Selenium, Biology	
2893U	Lake Beresford	Lake		Nutrients	
2893Z	St. Johns Riv Ab Lk George	Stream	DO, Nutrients, Total Suspended Solids	DO, Biology, Nutrients	
2921	Lake Woodruff	Lake		DO, Nutrients	

for reuse is 1.52 mgd, with Deland/Wiley Nash discharging 1.0 mgd and VCUD/Southwest Regional discharging the remaining 0.52 mgd.

The planning unit contains no Superfund or state-funded hazardous waste sites; however, there is one closed Class I solid waste landfill as well as two closed and one active Class III solid waste landfills, with one inactive and one active construction and debris landfill. One area is delineated for ground water contamination pursuant to Chapter 62-524, Florida Administrative Code, Potable Water Well Permitting in Delineated Areas, for EDB.

Land Use

The majority of land use in the planning unit is a combination of wetlands (35 percent) and upland forest (30 percent). Other major land uses include urban and built-up (17 percent), agriculture (10 percent), water (5 percent), and rangeland (2 percent). Less than 1 percent of the total land area is made up of barren land and transportation, communications, and utilities. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

Ecological Resources

The planning unit supports several unique or ecologically imperiled aquatic species. The rare and imperiled blueback herring (*Alosa aestivalis*) has been observed in this portion of the St. Johns River and Lake Woodruff (Hoehn, 1998). Unique aquatic invertebrate species that are sensitive to water quality are associated with Blue Spring. These are the Blue Spring siltsnail (*Cincinnatia parva*) and the Blue Spring hydrobe (*Aphaostracon asthenes*).

Planning and Management Activities

Two projects are currently under way in the south-central portion of the planning unit, west of DeLand, to retrofit existing stormwater management systems. The first, the West Minnesota Avenue Retention Pond

Expansion, will expand the capacity of an existing pond constructed in the 1970s. The pond's appearance will be improved by flattening its side slopes, eliminating fencing, and providing new landscape plantings (URS, 2001).

The second project is the Thompson–Mathis Retention Area Expansion. Additional land was acquired to expand the existing pond by approximately two acres to provide water quantity and water quality benefits.

Appendix C summarizes restoration and protection efforts in the basin, by planning unit.

- **Wekiva River Planning Unit**

General Description

The Wekiva River planning unit, within portions of Orange, Seminole, Lake, and Marion Counties, drains 240,123 acres (more than 376 square miles) and contains both spring-fed and blackwater streams. Major tributaries include the Little Wekiva River, Rock Springs Run, and Blackwater Creek (SJRWMD, 2002a).

The Wekiva and Little Wekiva Rivers, upstream of State Road 434, are designated as OFWs. The federal government has classified segments of the Wekiva River as a Wild and Scenic River and the state as a Scenic and Wild River. As specified by Florida's Wekiva River Protection Act (1988), the Wekiva River also has special criteria for Environmental Resource Permits (ERP), which are regulated by St. Johns River Water Management District. The act also required local governments to amend comprehensive planning policy and land development regulations to protect habitat and prevent wetland losses.

Water Quality Summary

Figure 3.10 shows a composite map of potentially impaired waters and potential point and nonpoint sources of pollution in the Wekiva River planning unit. Water quality data collected from 177 sampling stations were used for assessment (**Appendix G**). **Table 3.11** summarizes all causes of potential impairment for individual waterbody segments. The table and figure show 31 potentially impaired waterbody segments.

Water quality ratings in the planning unit range from good to poor. An increase in flow rate due to urbanization is a major problem in the Little Wekiva River. The movement and deposition of sediments have also adversely affected water quality and the environment (SJRWMD, 2001c). The major parameters of concern for the planning unit are high levels of nutrients, DO, and metals. Additionally, the Little Wekiva watershed has impairment by coliform bacteria. One segment of the Wekiva River is potentially impaired for biology. Lake Dorr has a limited fish consumption advisory because of the levels of mercury in the tissue of largemouth bass, bowfin, and gar.

Two springs in the planning unit are potentially impaired: Wekiwa Spring and Rock Springs Run. The parameters of concern in Wekiwa Springs are low DO and high levels of coliform bacteria and nutrients, while in Rock Springs Run they are DO, coliform bacteria, nutrients, copper, lead, and BOD.



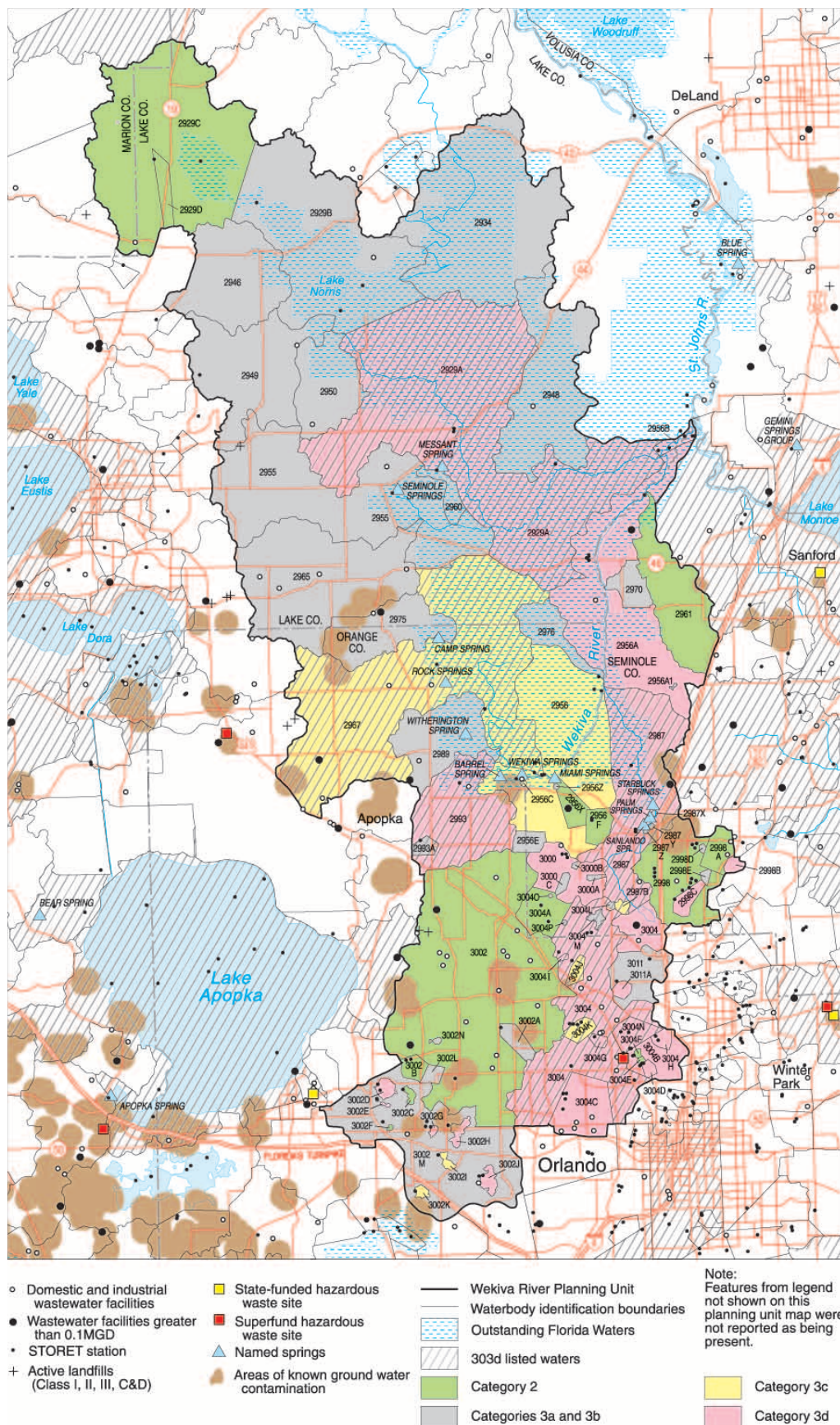


Figure 3.10: Composite Map of Potentially Impaired Waters and Potential Point and Nonpoint Sources in the Wekiva River Planning Unit

Table 3.11: Summary of All Causes of Potential Impairment in the Wekiva River Planning Unit (Based on the 1998 303(d) List and the Impaired Surface Waters Rule, and Including Parameters Proposed for Delisting)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule	Parameters Proposed for Delisting
2929A	Blackwater Creek	Stream	Cadmium, DO, Nutrients, Lead, Iron, Selenium, Zinc	DO, Iron, Selenium, Nutrients	Cadmium, Zinc
2929C	Lake Dorr	Lake	Fish Consumption Advisory–Mercury	Fish Consumption Advisory–Mercury	
2956	Wekiva River	Stream		DO, Copper, Lead	
2956A	Wekiva River	Stream		DO, Copper, Lead, Nutrients	
2956B	Wekiva River Lower	Stream		DO	
2956C	Wekiwa Spring (Orange)	Spring	Coliforms, Nutrients	DO	Nutrients, Fecal and/or Total Coliform
2967	Rock Springs Run	Spring	Coliforms, DO, Nutrients, BOD	DO, Total Coliforms, Copper, Lead	Nutrients, Fecal Coliforms
2987	Little Wekiva River	Stream	Coliforms, Nutrients	Fecal Coliform, Total Coliforms, Lead, Nutrients	
2987A	Spring Lake	Lake		Nutrients	
2987B	Wekiva River NW Ave T	Stream		Biology	
2993	Lake Prevatt	Lake	Coliforms, DO, Nutrients	DO, Nutrients, Copper, Lead	Fecal and Total Coliforms
2998B	Lake Mobile	Lake		Nutrients	
2998C	Lake Orienta	Lake		Nutrients	
3000	Lake Pearl	Lake		Nutrients	
3002D	Starke Lake	Lake		Nutrients, Copper, Lead	
3002E	Lake Primavista	Lake		Nutrients, Lead	
3002G	Lake Lotta	Lake		Nutrients	
3002H	Lake Sherwood	Lake		DO, Nutrients	
3002I	Lake Rose	Lake		Nutrients	
3002J	Lake Hiawassee	Lake		Nutrients, Copper, Lead	
3002K	Lake Olivia	Lake		Nutrients	
3004	Little Wekiva Canal	Stream	Coliforms, Nutrients, DO, BOD	DO, Copper, Total Coliforms, Cadmium, Nutrients	Fecal Coliforms
3004B	Lake Fairview	Lake		Nutrients, Copper, Lead	
3004C	Lake Lawne	Lake		Nutrients, Copper, Lead	
3004D	Silver Lake	Lake		Nutrients	
3004G	Bay Lake	Lake		Nutrients	
3004H	Little Lake Fairview	Lake		Nutrients	
3004I	Lake Rose	Lake		Nutrients, Copper	
3004J	Lake Gandy	Lake		DO	
3004K	Lake Wekiva/Orlando	Lake		Nutrients	
3004N	Lake Fairview	Lake		Nutrients, Lead, Copper	
3011A	Lake Weston	Lake		Nutrients	



Twenty-two lakes in the planning unit are potentially impaired. The parameters of concern are mainly nutrients, copper, and lead. In addition, a limited fish consumption advisory has been issued for Lake Dorr.

Several of the headwater springs in the Wekiva system have recorded dissolved nitrate concentrations (expressed as nitrogen) above 1 milligram (mg) per liter. A recent study found that the nitrate levels in Wekiwa Springs were 1.92 mg per liter; in Rock Springs, 1.620 mg per liter; and in Seminole Springs, 1.41 mg per liter (Toth, 1999).

Point Sources

There are 60 permitted point source dischargers in the Wekiva River planning unit. Of these, 39 are domestic wastewater facilities, 18 are industrial wastewater facilities, 2 are concrete batch plants, and 1 is a petroleum contamination cleanup site. Six facilities are NPDES permitted and discharge directly to surface waterbodies. Nine facilities are permitted to discharge more than 0.100 million gallons per day (mgd). The Altamonte Springs/Swofford facility, permitted for the largest discharge at 12.50 mgd, is a domestic wastewater plant and is NPDES permitted. The remaining 8 point sources with discharges greater than 0.100 mgd, are all domestic wastewater facilities. Two of these, Wekiva Hunt Club (2.9 mgd) and Seminole County Environmental Services/Northwest Regional (2.5 mgd), are permitted under NPDES. **Appendix E** lists, by planning unit, the permitted dischargers in the basin.

Eleven sites in the planning unit implement reuse plans, including reuse for irrigation, reuse into percolation ponds, and public access reuse, with at least 3.68 mgd being discharged for these purposes. Altamonte Springs/Swofford provides treated wastewater effluent for irrigation, while the city of Ocoee (domestic wastewater, permitted to 3.0 mgd) has public access reuse plans. The Audubon Village Mobile Home Park (domestic wastewater, permitted to 0.049 mgd) is classified as a wastewater reuse facility, with discharge to two percolation ponds.

The planning unit contains one active Superfund site and one delisted state-funded hazardous waste site. There is one closed Class I solid waste landfill in the planning unit and no construction and debris landfills. Pursuant to Chapter 62-524, Florida Administrative Code, Potable Water Well Permitting in Delineated Areas, there are 21 delineated ground water contamination areas for benzene and EDB.

Land Use

Predominate land uses in the Wekiva River planning unit are urban and built-up (29 percent), upland forest (22 percent), and wetlands (20 percent). Other major land uses include agriculture (15 percent), rangeland (17 percent), and water (5 percent). Barren land and transportation, communication, and utilities make up approximately 1.5 percent of total land use. **Appendix F** provides a detailed analysis of land use in the basin, by planning unit.

Much of the basin was developed prior to stormwater management requirements. Development has caused increases in stormwater flow rates and volumes, erosion of the riverbank and bed, build-up of sediment, and

increases in the amount of pollutants going into the river (SJRWMD, 2001c). A study in the early 1990s predicted rapid growth in this area and therefore an increase in urban runoff (Alvarez, Lehman, and Associates, 1991).

The Middle St. Johns Basin Reconnaissance Report (URS, 2001) found that in the northern portion of the planning unit, nonpoint source pollution is occurring as a result of stormwater runoff and agricultural drainage, while the middle portion receives urban runoff from a development near the Lake McCoy chain of lakes. The report found that lack of adequate stormwater management infrastructure, along with rapid urbanization, have contributed to water quality problems in the southern end of the planning unit.

Ecological Resources

Intense development between 1944 and 1988 has resulted in loss of wetlands and has had a negative effect on native plants and wildlife in parts of the planning unit. Parts of the Little Wekiva River watershed have undergone extensive urbanization and loss of native species.

A number of sensitive endemic aquatic species are found in springs and spring-fed streams in the planning unit. Spring-run ecological communities found in the Wekiva River, Little Wekiva River, Rock Springs Run, Seminole Creek, and Sulphur Run are ranked by the Nature Conservancy as globally imperiled (Hupalo et al., 1994). The rare and imperiled blue-nose shiner (*Pteronotropis welaka*) has been observed in the Wekiva River (Hoehn, 1998). Several sensitive species of aquatic snails with narrow habitat requirements are endemic to watershed springs. The Wekiwa siltsnail (*Cincinnatia wekiwae*) is found in Wekiwa Springs; the Rock Springs siltsnail (*Cincinnatia petriphons*) is found at Rock Springs; the ponderous siltsnail (*Cincinnatia ponderosa*) occurs at Sanlando Springs; and the Seminole siltsnail (*Cincinnatia vanhyningi*) is found at Seminole Springs (Hupalo et al., 1994). Another aquatic species found in ground water habitats is the Orlando cave crayfish (*Procambarus acherontis*), an endemic subterranean crayfish. This species has been observed in Palm Spring, on the Little Wekiva River, and in wells in the Orlando area, although rarely (Hupalo et al., 1994).

Planning and Management Activities

Numerous plans and regulatory actions have been initiated to monitor, correct, and ultimately improve water quality and habitats in the planning unit. Minimum flows and levels have been established for the Wekiva River and associated springs. Water quality management plans include the Little Wekiva River Watershed Plan; Wekiva River Section 22 Studies; Stormwater Retrofit Programs; Sweetwater Cove Tributary to the Wekiva River Sediment Control Project; Lake Orienta; Lake Lotta/Lake Sherwood Artificial Recharge Demonstration Project and Starke Lake Drainwell Relocation Proposals; Blackwater Creek Study; a master plan to address water quality and flood protection issues; drainage basin studies; Lake County wastewater, water, and reuse master plan for the Sorrento and Mt. Plymouth areas; and the East-Central Florida Regional Planning Council's



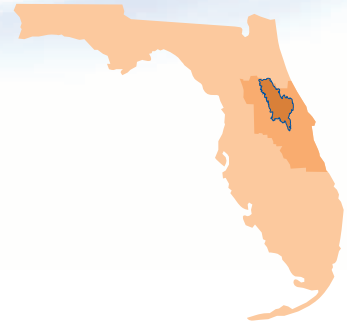


study of computer modeling of potential impacts to the Wekiva River protection area. **Appendix C** summarizes restoration and protection efforts in the basin, by planning unit.

Chapter 4: Planning List of Potentially Impaired Waters

Chapter Summary

This chapter presents the Department's "planning list" of potentially impaired surface waters in the Middle St. Johns Basin, describes the relationship between the planning list and subsequent verified and 303(d) lists, and provides a list of waters that the Department intends to propose to delist from the 1998 303(d) list. It also identifies waters that are not impaired and waters without enough data to determine potential impairment.





The Planning List

The methodology used to develop the planning list follows the tenet of “independent applicability,” which means that a water will be listed if any of its designated uses are potentially impaired. As such, the planning list (**Table 4.1**) can be thought of as a summary of any potential impairment noted in the assessment chapter, based on the impaired surface waters rule (IWR) and the 1998 303(d) list in the basin. The table lists each waterbody segment, why it was listed as potentially impaired, and the parameters of concern. It also differentiates between potential impairments related to the impaired surface waters assessment and those related to the 1998 303(d) list. Waters on the planning list must meet specific thresholds and data sufficiency and data quality requirements in Chapter 62-303, Florida Administrative Code. However, waters that were previously on the 1998 303(d) list, but for which there were insufficient data for an assessment, are included on the planning list. The 303(d) listed waters will receive higher priority for monitoring and total maximum daily load (TMDL) development.

Summary of Types of Impairment

This section presents the waters in each planning unit that are potentially impaired by individual waterbody segments (**Table 4.1**). **Appendix H** is a summary of water quality data for each planning unit by waterbody type. **Appendix I** lists the potentially impaired waterbody segments in the basin, by water quality parameter, based on the IWR. **Appendix J** is the complete listing of all evaluated segments including the 1998 303(d) list, IWR evaluation, and integrated assessment categories.

Impairments by Water Quality Parameters

The preliminary assessment in this Basin Status Report includes an evaluation of approximately 90 water quality parameters. **Table 4.1** shows potentially impaired waters and the specific parameters of impairment for the Middle St. Johns Basin. **Tables I-1** and **I-2** in **Appendix I** list all of the parameters assessed.

To provide a broad overview of the assessment, the parameters have been grouped into seven major categories: bacteria, biology, fish, nutrients (Trophic State Index [TSI]/chlorophyll *a*), unionized ammonia, metals, and dissolved oxygen (DO). **Figures 4.1 through 4.7**, respectively, show the waterbodies in the basin that are potentially impaired for each parameter group. A detailed methodology for the assessment, including more detailed descriptions of the parameter groups, can be found in Chapter 3 and **Appendix D**.

Of 361 delineated WBIDs, 193 had sufficient data for a least one parameter to be assessed for impairment. Of the 193 WBIDs, 108 are identified as having potential water quality impairment for at least one parameter. Summaries of impairment by parameter group follow.

Table 4.1: Potentially Impaired Waters in the Middle St. Johns Basin

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule
Alexander Springs Creek Planning Unit				
2918B	Buck Lake	Lake	Coliforms	
Deep Creek Planning Unit				
2893F	St. Johns Riv Ab Lk Jesup	Stream		DO, Nutrients
2925	Deep Cr-Lk Ashby Ca	Blackwater	Silver, Cadmium, Coliforms, Lead, Iron	Iron, Lead, DO, Cadmium
2925A	Lake Ashby	Lake		Iron, Copper, Lead
2931	Lake Winnemissett Outlet	Lake		Lead, Selenium
2964	Under Hill Slough	Stream		DO
2964A	Lake Harney	Lake	Silver, Cadmium, DO, Nutrients, Fish Consumption Advisory–Mercury	DO, Nutrients, Fish Consumption Advisory–Mercury, Lead, Cadmium
Econlockhatchee River Planning Unit				
2991	Econlockhatchee River	Stream	Fish Consumption Advisory–Mercury	DO, Fish Consumption Advisory–Mercury, Copper, Lead, Cadmium
2991A	Econlockhatchee River	Stream	Coliforms, DO, Fish Consumption Advisory–Mercury, Nutrients, Lead, BOD	DO, Fish Consumption Advisory–Mercury, Copper, Lead, Silver, Cadmium
3001	Little Econlockhatchee	Stream	Coliforms, DO, Nutrients, BOD	DO, Total Coliforms, Biology, Copper, Lead
3003	Lake Pickett	Lake		Nutrients, Copper, Lead
3003A	Mills Lake	Lake		Biology
3014	Crane Strand Drain	Stream	DO, Nutrients, BOD	Biology, DO
3019	Lake Tanner Outlet	Lake		DO, Nutrients, Copper
3022	Bithlo Branch	Stream		Biology
3023	Crane Strand	Stream		DO, Total Coliforms, Fecal Coliforms, Lead
3023A	Lake Baldwin	Lake		Total Coliforms, Nutrients, Copper, Lead
3023B	Lake Barton	Lake		Nutrients, Lead
3024	Lake Downey	Lake		Nutrients, Lead, Copper
3024A	Trib to Ltl Econ Riv	Stream		DO, Total Coliforms, Fecal Coliforms, Lead
3030	Long Branch	Stream	Coliforms, DO, Nutrients, Iron, BOD, Turbidity	DO
3033	Unnamed Drain	Stream		Biology
3033C	Lake Corner	Lake		Nutrients
3033D	Lake Drawdy	Lake		DO, Nutrients
3036	Lake Frederica	Lake		Nutrients
3037	Unnamed Drain	Stream		DO, Biology

Table 4.1 (continued)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule
Lake George Planning Unit				
22130	St. Johns River Above Ocklawaha	Stream		Nutrients
2893A	Lake George	Lake		DO, Nutrients, Selenium, Biology, Cadmium
2893A1	St. Johns River Below Lake George	Stream		Nutrients
2893A2	St. Johns River Above Lake George	Stream		DO, Nutrients
Lake Jesup Planning Unit				
2981	Lake Jesup	Lake	Unionized Ammonia, Nutrients	Unionized Ammonia, Nutrients, Lead
2984	Lake Nan	Lake		Nutrients
2985	Chub Creek	Stream		DO, Iron, Nutrients
2986	Soldier Creek Reach	Stream	Coliforms, DO, Nutrients, Lead	Fecal Coliform, Lead, Silver, DO, Nutrients
2990	Salt Creek	Stream		Biology, DO, Iron, Nutrients
2992	Sweetwater Creek	Stream		Biology, DO
2994A	Gee Creek	Stream	Coliforms, Nutrients, Lead	Fecal Coliform, Lead, Silver, Nutrients
2994H	Lake Griffin	Lake		Nutrients
2994Y	Fruitwood Lake	Lake		Nutrients
2996	Sweetwater Creek	Stream		Biology
29977	Lake in the Woods	Lake		Nutrients
2997	Howell Creek below Lake Howell	Stream		Nutrients
2997A	Howell Creek	Stream		DO, Copper, Lead
2997B	Howell Lake	Lake		Nutrients
2997C	Lake Maitland	Lake		Lead, Nutrients
2997D	Lake Minnehaha	Lake		Nutrients
2997E	Lake Osceola North	Lake		Nutrients, Copper, Lead
2997E1	Lake Osceola South	Lake		Nutrients
2997F	Lake Ivanhoe	Lake		Nutrients, Lead
2997G	Lake Virginia	Lake		Nutrients, Copper, Lead
2997I	Lake Sue	Lake		Nutrients, Lead
2997J	Lake Rowena	Lake		Nutrients
2997K	Lake Estelle	Lake		Nutrients
2997L	Lake Winyah	Lake		Nutrients
2997M	Lake Formosa	Lake		Nutrients
2997P	Lake Concord	Lake		Nutrients
2997Q	Lake Dot	Lake		Nutrients
2997R	Lake Adair	Lake		Nutrients

Table 4.1 (continued)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule
Lake Jesup Planning Unit, continued				
2997S	Lake Spring	Lake		Nutrients
2997U	Lake Park	Lake		Nutrients
2997X	Lake Killarney	Lake		Nutrients, Copper
2997Y	Lake Mizell	Lake		Nutrients
3009	Bear Gulley Lake	Lake		Nutrients
3009A	Waunatta Lake	Lake		DO, Nutrients
3009C	Lake Burkett	Lake		Nutrients
3009D	Deep Lake	Lake		DO, Nutrients, Copper, Lead
3009E	Lake Georgia	Lake		DO, Turbidity
Lake Kerr Planning Unit				
2899	Little Lake Kerr Outlet	Lake	Fish Consumption Advisory–Mercury	Fish Consumption Advisory–Mercury
2899A	Hopkins Prairie	Stream		DO, Lead, Zinc
2899B	Lake Kerr	Lake		Copper, Lead, Selenium, Silver, Cadmium
Lake Monroe Planning Unit				
2893C	St Johns Riv Ab Wekiva Riv	Stream	DO, Nutrients, Lead, BOD, Total Suspended Solids	DO, Nutrients, Biology
2893D	Lake Monroe	Lake	DO, Nutrients, Lead, Selenium	DO, Nutrients, Selenium, Silver
2893E	St Johns Riv Ab Lk Monroe	Stream		DO
2951	Lake Marie	Lake		Nutrients
2962	Smith Canal	Stream	Coliforms, DO, Nutrients, Iron, Turbidity	Biology
2981A	Lake Jesup Nr St Johns Riv	Lake	DO, Nutrients	DO, Nutrients
Lake Woodruff Planning Unit				
28933	Volusia Blue Spring	Spring	Nutrients	DO
2893B	St Johns Riv Ab Lk Woodruff	Stream		DO, Nutrients, Selenium, Biology
2893U	Lake Beresford	Lake		Nutrients
2893Z	St Johns Riv Ab Lake George	Stream	DO, Nutrients, Total Suspended Solids	DO, Biology, Nutrients
2921	Lake Woodruff	Lake		DO, Nutrients
Wekiva River Planning Unit				
2929A	Blackwater Creek	Stream	Cadmium, DO, Nutrients, Lead, Iron, Selenium, Zinc	DO, Iron, Selenium, Nutrients
2929C	Lake Dorr	Lake	Fish Consumption Advisory–Mercury	Fish Consumption Advisory–Mercury
2956	Wekiva River	Stream		DO, Copper, Lead

Table 4.1 (continued)

WBID	Waterbody Segment	Waterbody Type	Parameters Potentially Impaired on the 1998 303(d) List	Parameters Potentially Impaired Based on the 2001 Impaired Surface Waters Rule
Wekiva River Planning Unit, continued				
2956A	Wekiva River	Stream		DO, Copper, Lead, Nutrients
2956B	Wekiva River Lower	Stream		DO
2956C	Wekiva Spring (Orange)	Spring	Coliforms, Nutrients	DO
2967	Rock Springs Run	Spring	Coliforms, DO, Nutrients, BOD	DO, Total Coliforms, Copper, Lead
2987	Little Wekiva River	Stream	Coliforms, Nutrients	Fecal Coliform, Total Coliforms, Lead, Nutrients
2987A	Spring Lake	Lake		Nutrients
2987B	Wekiva River NW Ave T	Stream		Biology
2993	Lake Prevatt	Lake	Coliforms, DO, Nutrients	DO, Nutrients, Copper, Lead
2998B	Lake Mobile	Lake		Nutrients
2998C	Lake Orienta	Lake		Nutrients
3000	Lake Pearl	Lake		Nutrients
3002D	Starke Lake	Lake		Nutrients, Copper, Lead
3002E	Lake Primavista	Lake		Nutrients, Lead
3002G	Lake Lotta	Lake		Nutrients
3002H	Lake Sherwood	Lake		DO, Nutrients
3002I	Lake Rose	Lake		Nutrients
3002J	Lake Hiawassee	Lake		Nutrients, Copper, Lead
3002K	Lake Olivia	Lake		Nutrients
3004	Little Wekiva Canal	Stream	Coliforms, DO, Nutrients, BOD	DO, Copper, Total Coliforms, Cadmium, Nutrients
3004B	Lake Fairview	Lake		Nutrients, Copper, Lead
3004C	Lake Lawne	Lake		Nutrients, Copper, Lead
3004D	Silver Lake	Lake		Nutrients
3004G	Bay Lake	Lake		Nutrients
3004H	Little Lake Fairview	Lake		Nutrients
3004I	Lake Rose	Lake		Nutrients, Copper
3004J	Lake Gandy	Lake		DO
3004K	Lake Wekiva/Orlando	Lake		Nutrients
3004N	Lake Fairview	Lake		Nutrients, Lead, Copper
3011A	Lake Weston	Lake		Nutrients

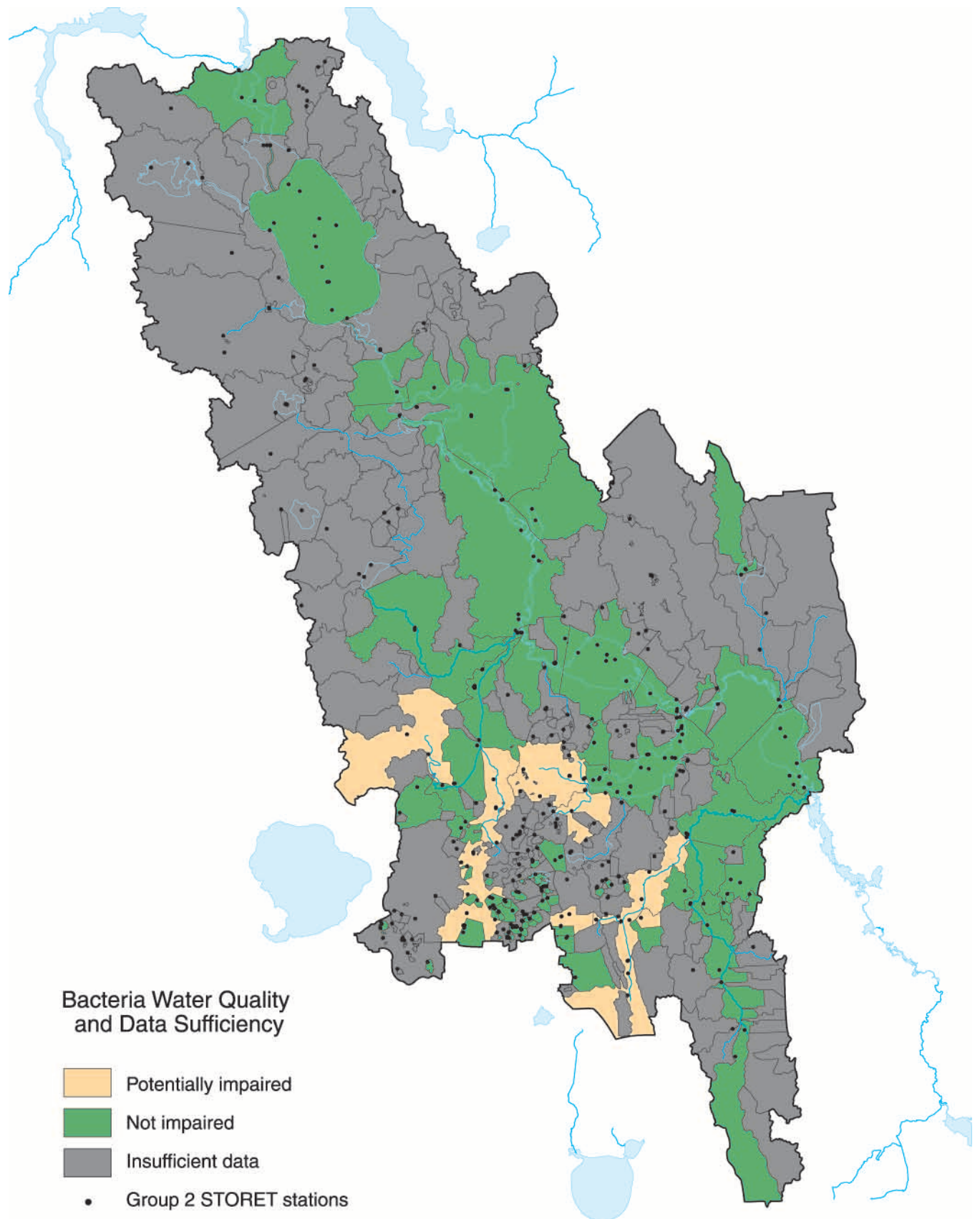


Figure 4.1: Middle St. Johns Basin Waters Potentially Impaired for Bacteria According to the Impaired Surface Waters Rule

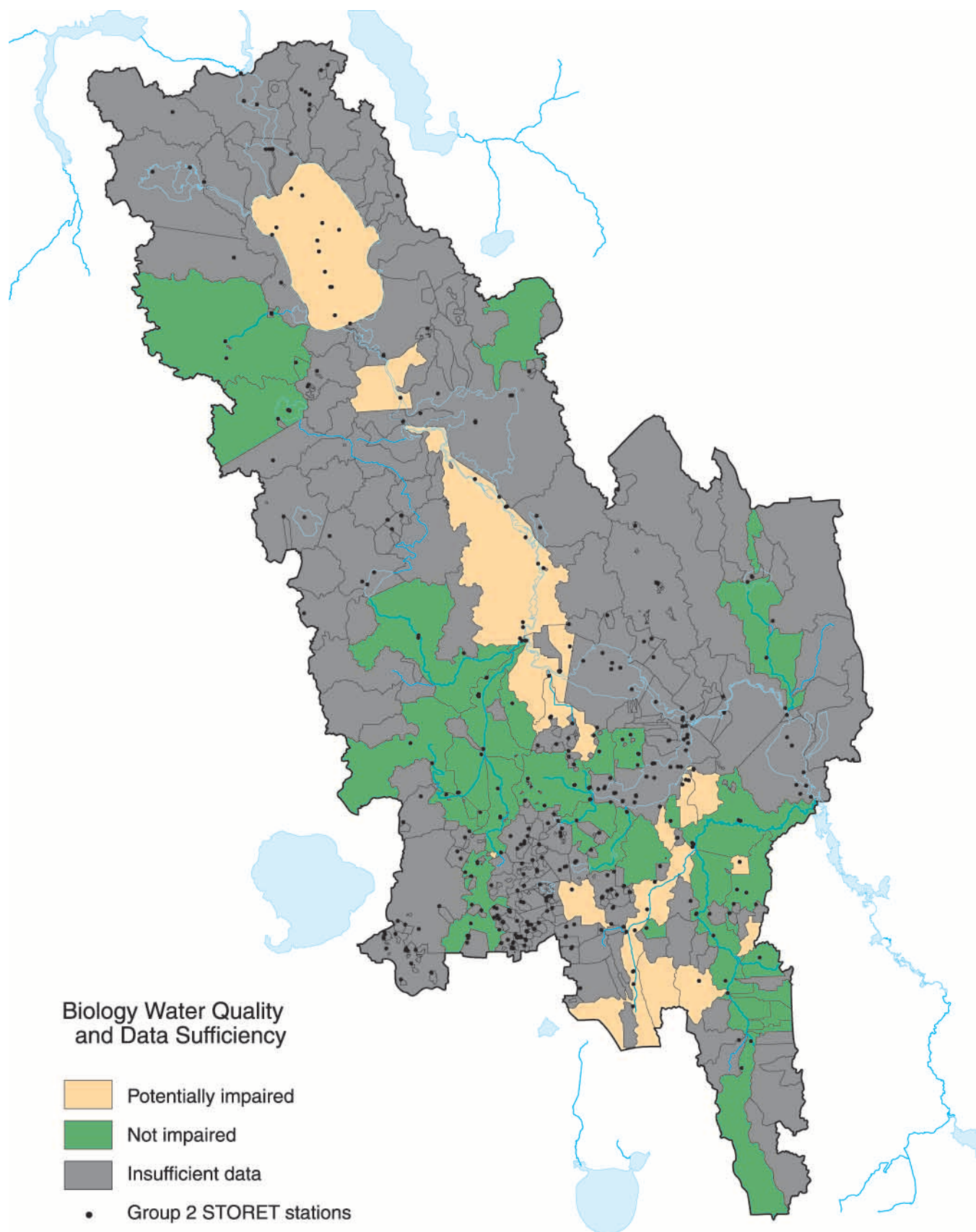


Figure 4.2: Middle St. Johns Basin Waters With Potentially Impaired Biology According to the Impaired Surface Waters Rule

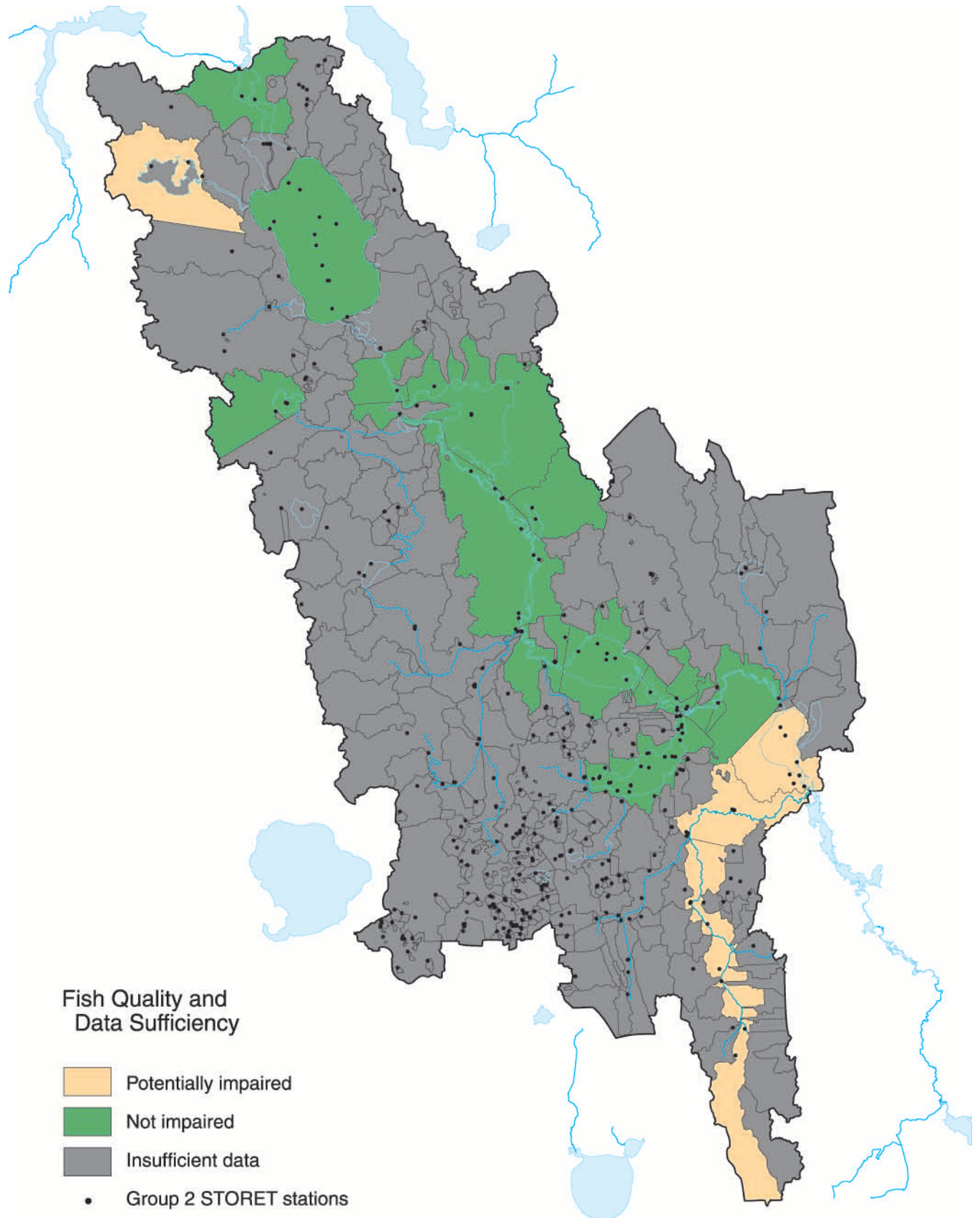


Figure 4.3: Middle St. Johns Basin Waters Potentially Impaired for Fish According to the Impaired Surface Waters Rule

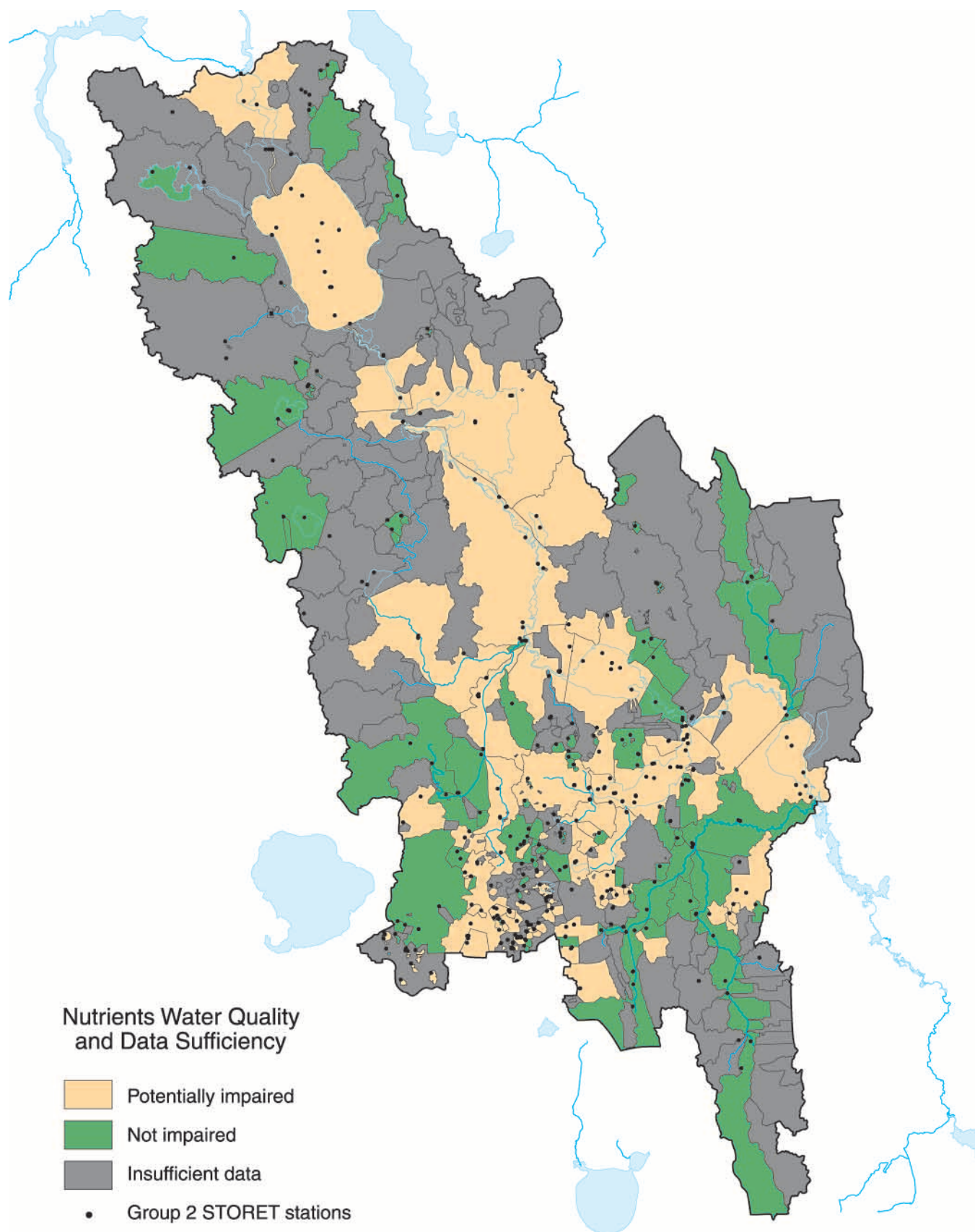


Figure 4.4: Middle St. Johns Basin Waters Potentially Impaired for Nutrients According to the Impaired Surface Waters Rule

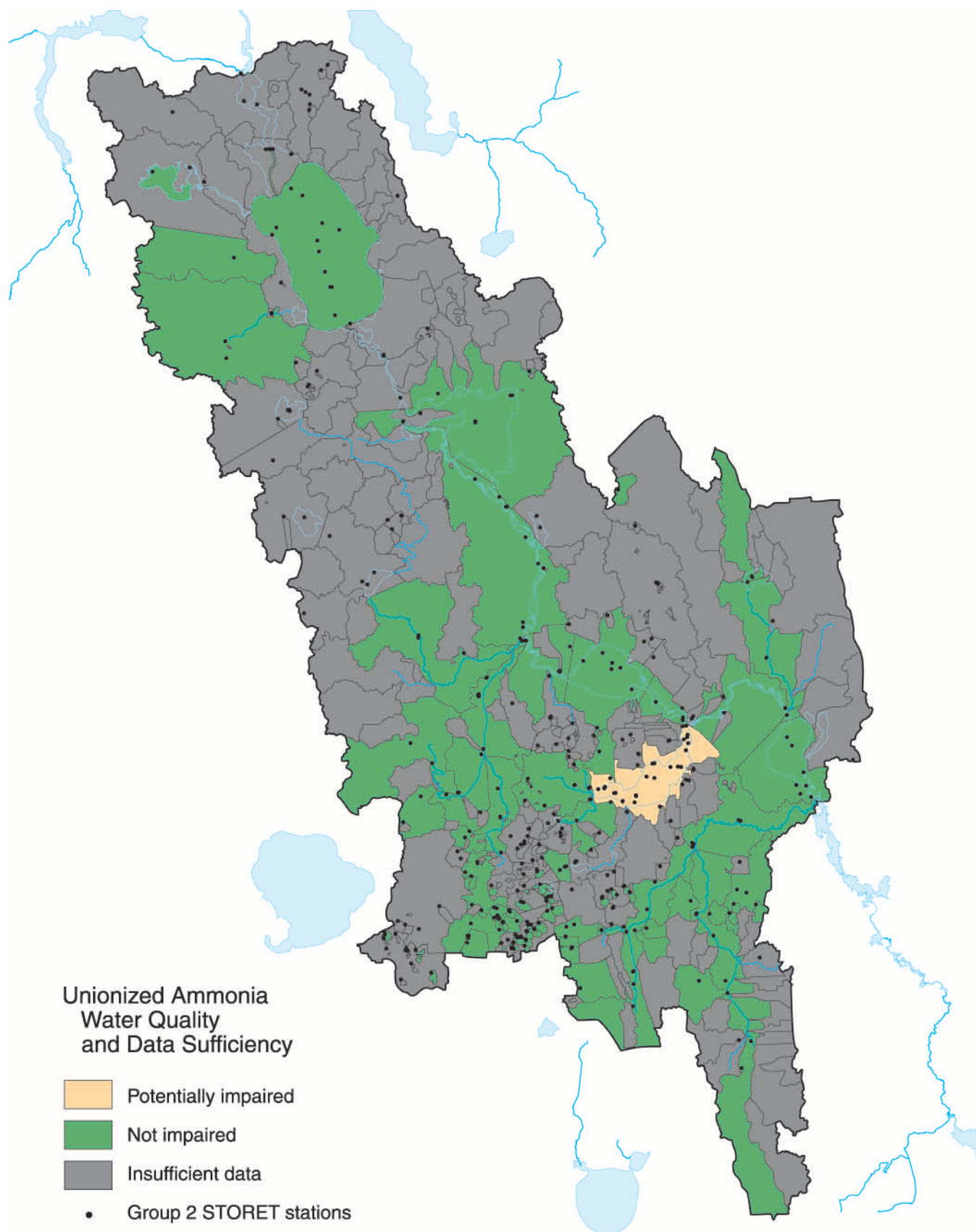


Figure 4.5: Middle St. Johns Basin Waters Potentially Impaired for Unionized Ammonia According to the Impaired Surface Waters Rule

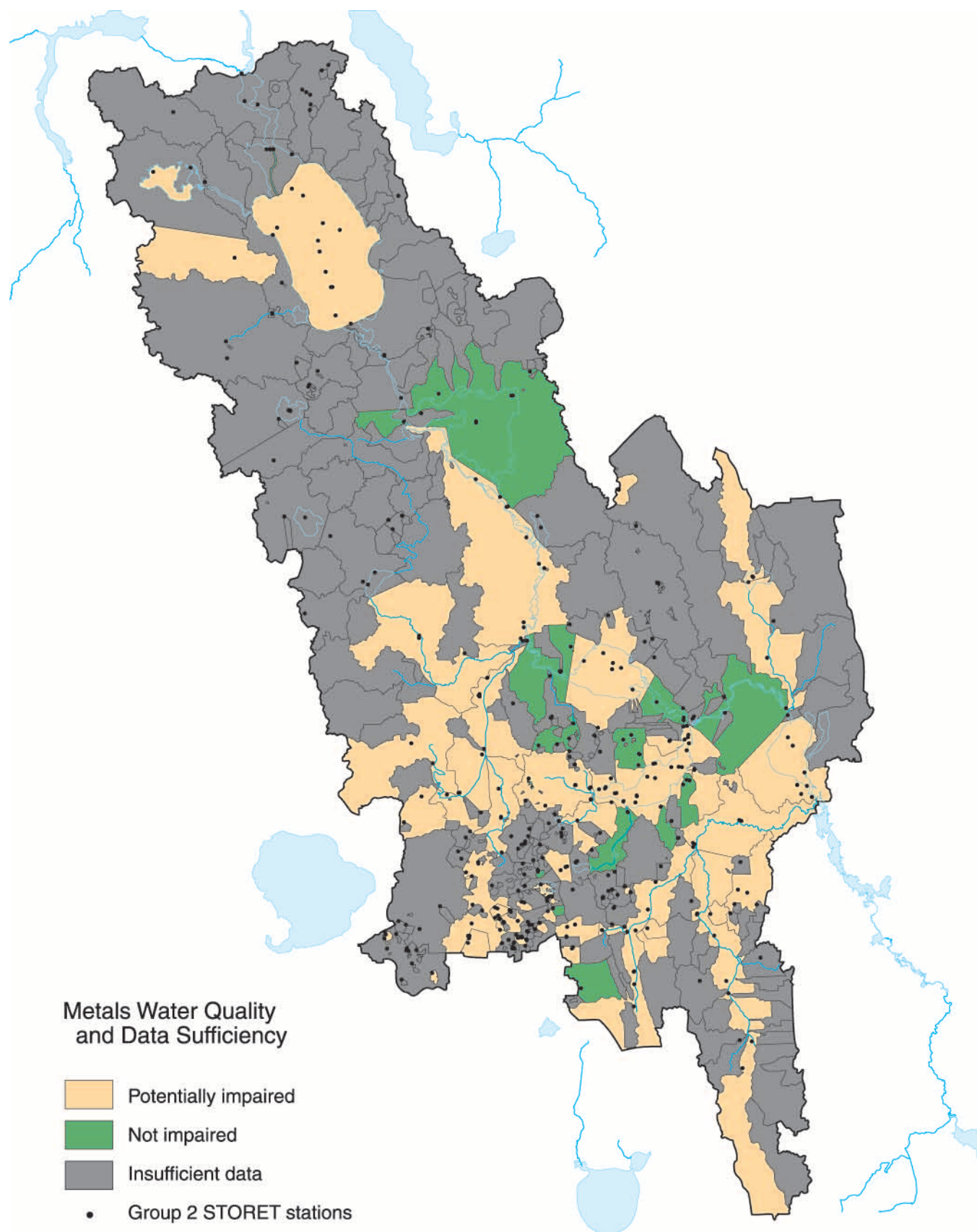


Figure 4.6: Middle St. Johns Basin Waters Potentially Impaired for Metals According to the Impaired Surface Waters Rule

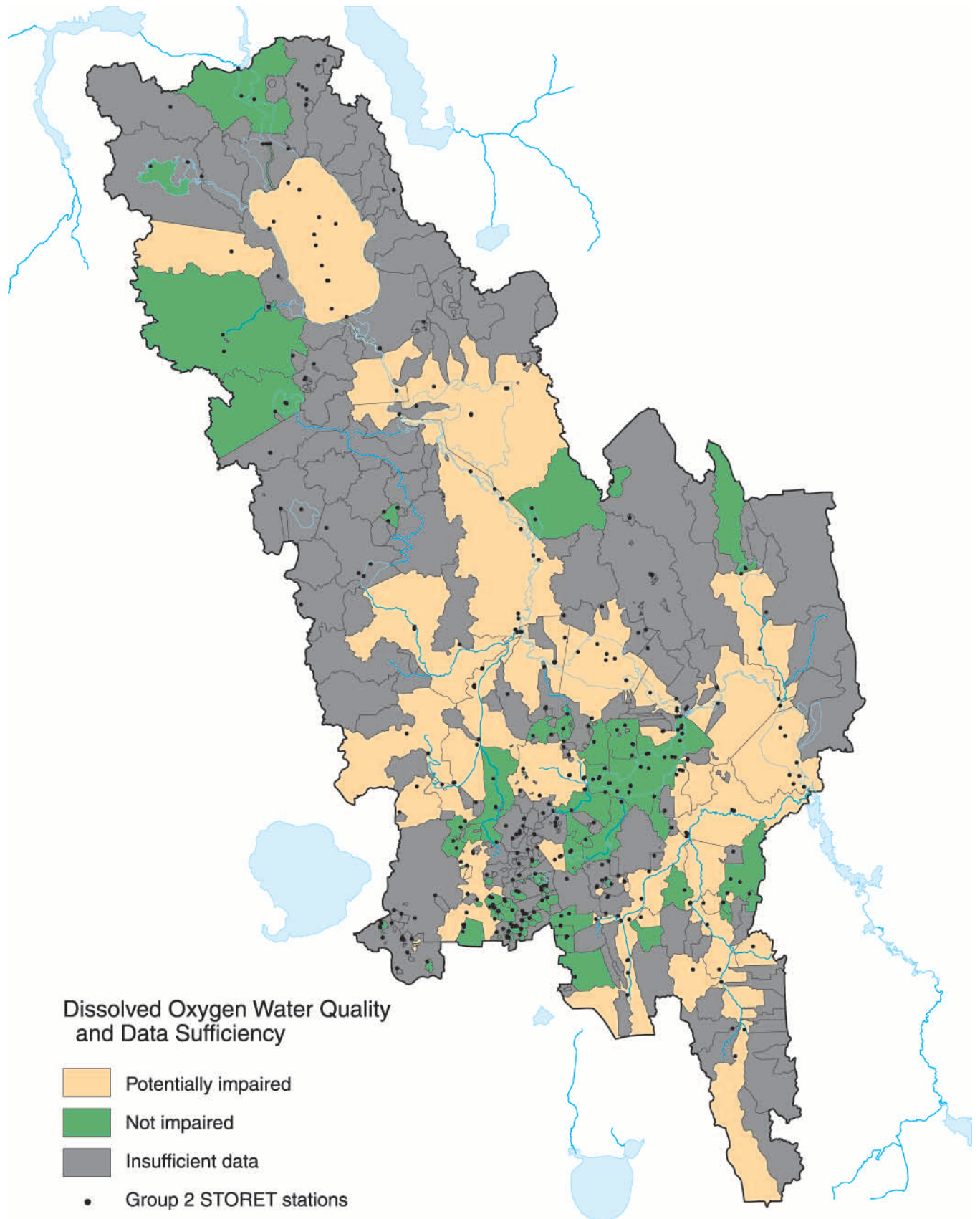


Figure 4.7: Middle St. Johns Basin Waters Potentially Impaired for Dissolved Oxygen According to the Impaired Surface Waters Rule



Bacteria, DO, and Unionized Ammonia

The presence of bacteria (fecal coliforms and total coliforms) in a waterbody indicate the possible presence of disease-causing organisms. Bacterial impairment is not widespread in this basin with only 11 waterbodies listed for either fecal or total coliforms bacteria: 1 spring, 2 lakes, and 8 streams.

DO is necessary to ensure the continued health of aquatic biota. It is also important to the chemical transformation and degradation processes occurring in water. Potential DO impairment was found in 42 waterbodies throughout the basin: 15 lakes, 3 springs, 1 blackwater stream, and 23 streams. Not all low DO is caused by anthropogenic activities. A number of natural healthy systems, such as wetlands, springs, and blackwater streams, have naturally occurring lower levels of oxygen. For those waterbodies listed for DO impairment, a cause must be identified for the waterbody to be verified as impaired.

Unionized ammonia is calculated from concentrations of ammonium with respect to temperature and pH of the waterbody. Only WBID 2981 (Lake Jesup) was impaired for unionized ammonia.

Biology

The numbers and types of organisms present in a waterbody serve as indicators of biological health. Based on analysis of macroinvertebrate communities, 15 segments in the basin were potentially impaired for biology: 13 streams and 2 lakes.

WBID 2893Z (St. Johns Riv Ab Lake George), WBID 2962 (Smith Canal), WBID 2987B (Wekiva River NW Ave T), WBID 2990 (Salt Creek), WBID 2992 (Sweetwater Creek), WBID 2996 (Sweetwater Creek), WBID 3022 (Bithlo Branch), WBID 3001 (Little Econlockhatchee), WBID 2893A (Lake George), and WBID 3037 (Unnamed Drain, used as a test site for Orange County Utilities Division) met the criteria for the planning list based on Stream Condition Index (SCI) sampling. WBID 3003A (Mills Branch) met the criteria based on BioRecon sampling. WBID 2893B (St. Johns River Ab LK Woodruff), WBID 2893C (St. Johns River Ab Wekiva River), WBID 3014 (Crane Strand Drain), and WBID 3033 (Unnamed Drain, control for Orange County Utilities STP) met the criteria for the verified list based on SCI sampling. WBID 2893B had limited habitat due to algal growth.

Fish

This parameter comprises fish consumption advisories for mercury, a heavy metal that can affect human health and the environment. In 1993, the Florida Department of Health (DOH) and the U.S. Environmental Protection Agency (EPA) issued a limited consumption advisory for largemouth bass, bowfin, and gar in four WBIDs within the basin. These included the Econlockhatchee River in Orange and Seminole Counties, Lake Harney, and Little Lake Kerr.

Nutrients (TSI/Chlorophyll *a*)

The TSI for lakes and estuaries and chlorophyll *a* concentration in streams and rivers indicate nutrient enrichment in a waterbody. One hundred seventy-one waterbodies had sufficient data for evaluation of potential nutrients impairments. Potential nutrients impairments were found in 75 waterbodies: 16 streams and 59 lakes. Lakes with nutrients impairments were concentrated in the Wekiva and Lake Jesup planning units. Increased levels of nutrient loading were reported in both basins. Many of these lakes are located in Orange County or Orlando.

Metals

Heavy metals such as arsenic, cadmium, chromium, and lead in a waterbody can affect human health and the health of aquatic organisms. One hundred seven waterbody segments had sufficient data to be evaluated for potential metals impairments. Potential impairment by metals was found in 44 waterbodies: 1 blackwater stream, 1 spring, 25 lakes, and 17 streams. The only planning unit with metals impairments was Alexander Springs Creek. The metals commonly found were lead and copper followed in frequency of occurrence by silver, iron, selenium, and cadmium.

Impairments by Waterbody Type

Tables 4.2a and **4.2b** summarize the status of assessed and potentially impaired waters in the Middle St. Johns Basin based on water quality data collected from 1991 through 2000. The tables list the status of waterbody types in each planning unit. The following summarizes water quality by waterbody type for waters with sufficient data under the IWR.

Lakes

The majority of waterbody segments in the Middle St. Johns Basin are lakes. All planning units have lake segments. There are 220.1 square miles of lake waterbody segments in the basin, and 589 monitoring stations with data for the impairment parameters. Of the total square miles, 132.7 square miles (60.3 percent) were assessed for metals impairments, 171.8 square miles (78 percent) for nutrients impairments, 148.9 square miles (67.6 percent) for conventional impairments, 126.7 square miles (57.6 percent) for biology/fish, and 73.7 square miles (33.5 percent) for pesticides. None of the planning units had adequate data to allow the assessment of all lakes within their area.

Of the total lake area in the basin, 112.2 square miles (51 percent) were potentially impaired for metals, 141.7 square miles (64.4 percent) for nutrients, 103.6 square miles (47 percent) for conventionals, and 90.8 square miles (41.3 percent) for biology/fish. The Alexander Springs Creek planning unit had no potential impairments for lake waterbody segments out of the square miles assessed. The metals found in lakes of the Middle St. Johns are iron, cadmium, selenium, lead, and silver. The most common conventional stressor is DO.

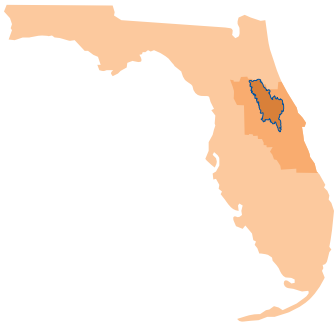


Table 4.2a: Summary of Water Quality Status Assessed by Waterbody Type in the Middle St. Johns

Waterbody Type	Stream Length (mi), Lake or Estuary Area (sq. mi)	Miles Assessed Using the Impaired Surface Waters Rule							
		Bacteria	DO	Unionized Ammonia	Metals	Fish	Nutrients (TSI/ Chlorophyll a)	Biology	Pesticides
Alexander Springs Creek Planning Unit									
Spring	0.1								
Lake	6.9		2.9	1.9		1.9	3.1	1.9	
Deep Creek Planning Unit									
Blackwater	8.7		3.7	3.7	3.7		3.7	3.7	
Lake	12.2	11.1	12.1	12.1	12.1	10.2	12.1		
Stream	28.9	28.9	28.9	28.9	27.5	27.5	28.9	5.0	
Econlockhatchee River Planning Unit									
Lake	9.5	8.3	8.4	9.0	6		8.4	1.0	
Stream	73.6	47.1	60.5	52.1	47.1	30.4	47.1	69.2	
Lake George Planning Unit									
Lake	89.2	73.7	73.7	73.7	73.7	73.7	84.1	73.7	73.7
Spring	0.1						0.1		
Stream	7.2	7.2	7.2	7.2	0.1	7	7.2		
Lake Jesup Planning Unit									
Stream	39.8	14.1	34.8	18.8	34.8		34.8	29.8	
Lake	25.9	20.9	23.4	20.3	18.5	13.1	24.5	1.1	
Lake Kerr Planning Unit									
Spring	5.5								
Stream	5.1		5.1	5.0	0.1		0.1	5.0	
Lake	9.1		0.1	0.1	0.1	7	1.1	1.0	
Lake Monroe Planning Unit									
Lake	22.5	13.6	14.6	13.7	14.5	14.7	20.6		13.6
Spring	0.1								
Stream	25.5	20.9	25.5	20.9	20.9	20.9	20.9	15.9	
Lake Woodruff Planning Unit									
Lake	10.5	4.5	4.5	3.1	3.4	4.5	5.5	5.0	
Spring	5		5						
Stream	120.1	120.1	120.1	102.4	102.4	120.1	120.1	120.1	
Wekiva River Planning Unit									
Stream	55.4	47.2	47.2	47.2	45.7		47.2	55.3	
Lake	17.3	6.2	8.6	6.0	4.4		12.4	1.1	
Spring	10.6	10.6	10.6	10.6	5.6		10.6	5.6	

Table 4.2b: Summary of Water Quality Status Impaired by Waterbody Type in the Middle St. Johns

Waterbody Type	Stream Length (mi), Lake or Estuary Area (sq. mi)	Miles Impaired Using the Impaired Surface Waters Rule							
		Bacteria	DO	Unionized Amonia	Metals	Fish	Nutrients (TSI/ Chlorophyll a)	Biology	Pesticides
Alexander Springs Creek Planning Unit									
Spring	0.1								
Lake	6.9								
Deep Creek Planning Unit									
Blackwater	8.7	3.7		3.7					
Lake	12.2	10.1		12.1		10.1	10.1		
Stream	28.9	27.5				27.5			
Econlockhatchee River Planning Unit									
Lake	9.5	1	1.1	5		6.2			
Stream	73.6	16.7	60.5	47.1		30.4	23.3		
Lake George Planning Unit									
Lake	89.2	73.7		73.7		73.7		73.7	
Spring	0.1								
Stream	7.2	0.1				7.2			
Lake Jesup Planning Unit									
Stream	39.8	9.1	20.8	24.1		23.8		10.5	
Lake	25.9	0.3		13.1	3.3	22			
Lake Kerr Planning Unit									
Spring	5.5								
Stream	5.1	0.1		0.1		0.1			
Lake	9.1				0.1	7			
Lake Monroe Planning Unit									
Lake	22.5	13.7		13.6		18.7			
Spring	0.1								
Stream	25.5	20.9				11.3		15.9	
Lake Woodruff Planning Unit									
Lake	10.5	3.4				4.5			
Spring	5	5							
Stream	120.1	120.1		102.4		120.1		120.1	
Wekiva River Planning Unit									
Stream	55.4	21.5	39	45.7		36.9		8.2	
Lake	17.3	1.3		4.4		6.5			
Spring	10.6	5.6	10.6	5.6					



Streams

Streams are found in every planning unit in the Middle St. Johns Basin. The Alexander Springs Creek planning unit, which has only 0.2 miles of total stream length, did not have monitoring stations with data for the impairment parameters. The total mileage of stream length for the basin is 374.3 miles, with 160 stations for monitoring impairment parameters. Of the total mileage, 278.6 miles (74.4 percent) were assessed for metals impairments, 306.3 miles (81.8 percent) for nutrients impairments, 329.3 miles (88 percent) for conventional impairments, and 334.8 miles (89.4 percent) for biology/fish.

The assessment concludes that 219.4 miles (58.6 percent) of the total stream miles in the basin were potentially impaired for metals, 226.8 miles (60.6 percent) for nutrients, 289 miles (77.2 percent) for conventionals, and 185.1 miles (49.5 percent) for biology/fish. Among streams in the basin, lead and copper were the most common stressors for the metals parameters. DO was the most common stressor in streams for conventional parameters. Biology was also regularly reported.

Blackwater Streams

Streams classified as blackwater had a pH less than 6.0 and a color value greater than 275 platinum cobalt units (PCUs). Within this basin, only one planning unit had waterbody segments that met this definition of blackwater streams. The Deep Creek planning unit has 2 blackwater streams with a total mileage of 8.7 miles. There are a total of 5 monitoring stations with data for the impairment parameters. Of the total blackwater stream mileage, 3.7 miles (42.5 percent) were assessed for metals impairments, 3.7 miles for nutrients, 3.7 miles for conventionals, and 3.7 miles for biology.

The evaluation concluded that 42.5 percent of the total blackwater streams in the basin were potentially impaired for metals and DO. Blackwater streams were not impaired for biology/fish or nutrients.

Springs

Total spring length is 30.7 miles, with 16 monitoring stations having enough data to assess potential impairments. All the planning units in the basin contain springs, except for Lake Jesup, Deep Creek, and the Econlockhatchee River. Three springs in the basin were placed on the 1998 303(d) list for potential impairments. Volusia Blue Spring, in the Lake Woodruff planning unit, is listed for potential impairment for nutrients; Wekiwa Springs, in the Wekiva River planning unit, is listed for potential impairments for nutrients and coliforms; and Rock Springs Run, in the Wekiva River planning unit, is listed for potential impairments for nutrients, coliforms, DO, and biochemical oxygen demand (BOD).

Of the total mileage of spring segments in the basin, 5.6 miles (18.2 percent) were assessed for metals impairments, 10.6 miles (34.5 percent) for nutrients impairments, 10.6 miles (34.5 percent) for conventionals, and 5.6 miles (18.2 percent) for biology. Total mileage of springs impaired for conventionals was 10.6 miles (34.5 percent) and 5.6 miles (18.2 percent) were impaired for metals; no springs were impaired for nutrients or biology.

Relationship between the Planning List and the 303(d) List

The planning list represents the first level of a two-stage process used to develop the state's Section 303(d) list of impaired waters. These potentially impaired waters will be further assessed during Phase 2 of the watershed management cycle to verify whether they are impaired. In addition to more thoroughly evaluating the data used to place these waters on the planning list (including verification of quality assurance and data sufficiency requirements), the Department, working with local stakeholders, will identify other existing data and collect additional data as needed to complete the assessment. Detailed strategic monitoring plans will be developed for each basin in cooperation with existing monitoring programs, with monitoring initially focused on verification of any impairment.

Once the additional monitoring is completed, the data will be assessed and the Department will develop a verified list of impaired waters. The planning and verified lists will be amended to include any additional water quality or biology data that are gathered or reported to the Department, once those data are verified through the IWR protocol.

The waterbody or segment is placed on the verified list if there is at least 90 percent confidence that water quality criteria are exceeded for at least 10 percent of the samples. A minimum of 20 samples collected over the most recent 5-year period will be analyzed. This list of waters, for which the Department will develop TMDLs, will be adopted by Secretarial Order. Once adopted, the list will be submitted to the EPA as the state's 303(d) list for the basin.

As stated in the 1999 Florida Watershed Restoration Act, the planning list will be submitted to the EPA for informational purposes only and will not be used in the administration or implementation of any regulatory program. However, the list is extremely important, as it is used to direct monitoring in the basin and is the precursor to the verified list. As such, stakeholders are encouraged to review the planning list very carefully, including the data used by the Department to produce the list. If stakeholders have access to recent data (collected in the last 10 years) that were not used, they should either enter the data into STORET or submit the data to the Department so that it can be used in the full assessment conducted in Phase 2 of the watershed management cycle. Local stakeholders are also encouraged to participate actively in the strategic monitoring, including the development of the strategic monitoring plan and conducting some of the monitoring.

Local stakeholders may also have plans that include activities to reduce pollution in impaired waters. If they feel their plans provide reasonable assurance that water quality standards will be met in the future, they should provide the Department with documentation that will support their restoration plans. As stated in the Florida Watershed Restoration Act, the Department will not place waters on the verified list if proposed or existing pollution control mechanisms are expected to result in the attainment of water quality standards. In fact, some local





stakeholders may want to develop restoration plans so that their waters are not listed on the verified or 303(d) lists.

Figure 4.8 shows waters on the planning list. 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.

Waters Proposed for Delisting

Not all of the waters on the 1998 303(d) list were placed on the planning list. The planning list includes only those waters listed in 1998 that did not have sufficient data or that met the thresholds for potential impairment. The Department plans to request the EPA to delist from the 1998 303(d) list the waters and parameters in **Table 4.3**. These waters met the data sufficiency requirements of the planning list, but were not identified as potentially impaired using the planning list methodology. As such, sufficient data exist to indicate the waters should be delisted, and they will not be placed on the planning list. It should be noted that both listing and delisting decisions are parameter specific, and some waters may remain on the list for other parameters.

Waters with Sufficient Data for Assessment That Are Not Impaired

Many waterbody segments that were assessed did not show impairment. **Appendix J** lists waterbody segments with sufficient data for assessment that are not impaired for identified parameters.

Waters without Enough Data To Determine Potential Impairment

For many waterbodies in the Middle St. Johns Basin, the available water quality data are not sufficient to make an assessment; **Appendix I** provides a list. Because of resource limitations, it will not be possible for the Department to monitor all of these waterbodies during the first watershed management cycle. The priority for strategic monitoring during Phase 2 of the cycle will be to conduct monitoring and data gathering to address potentially impaired waters identified on the planning list (**Table 4.1**). While the Department plans to monitor waters without enough data to determine potential impairment during subsequent watershed cycles, local stakeholders may want to take the initiative to monitor these waters sooner, and the Department would like to coordinate with these local efforts.

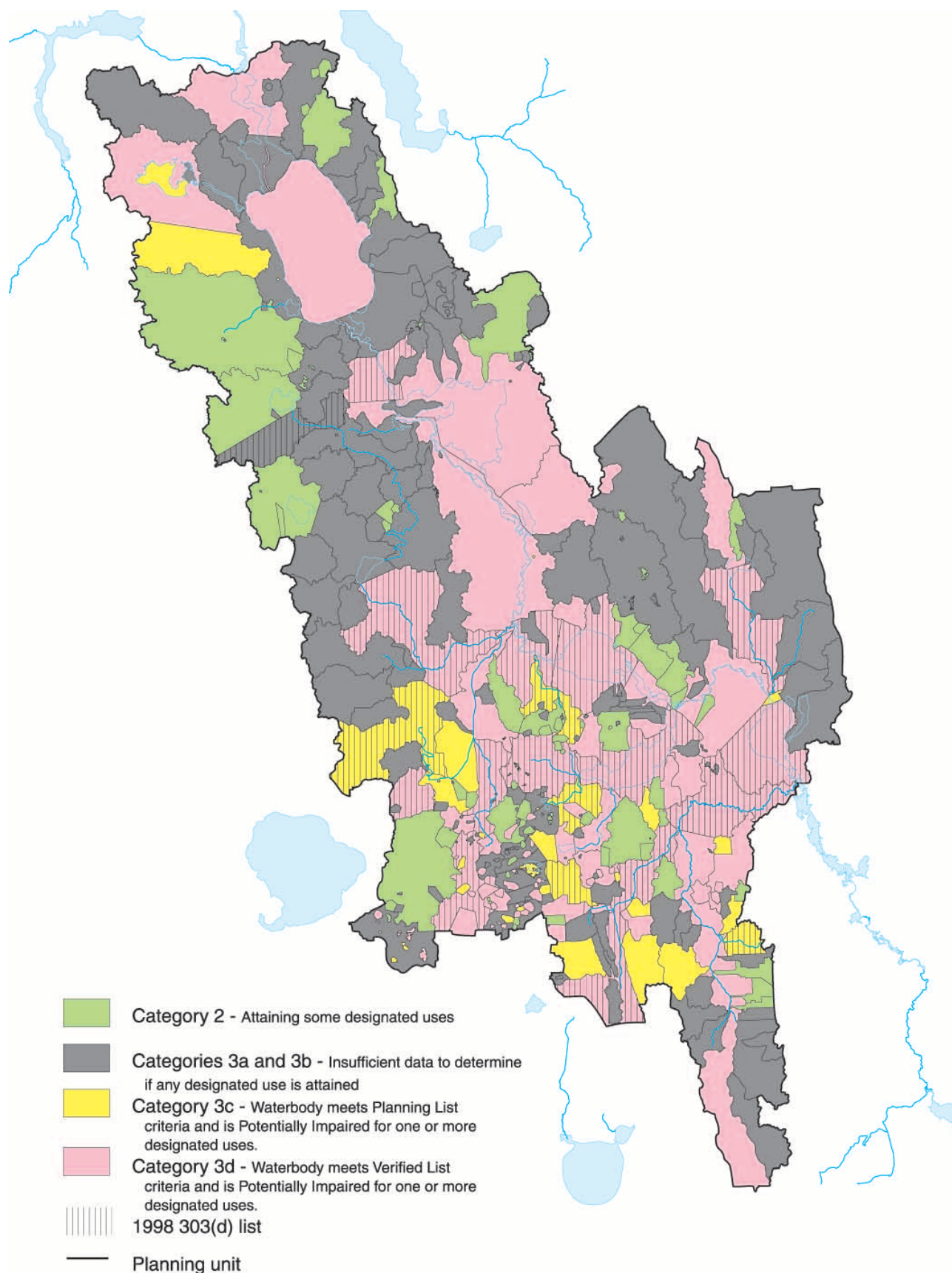


Figure 4.8: Middle St. Johns Basin Planning List for All Causes of Potential Impairment, with Overlay of 1998 303(d) List

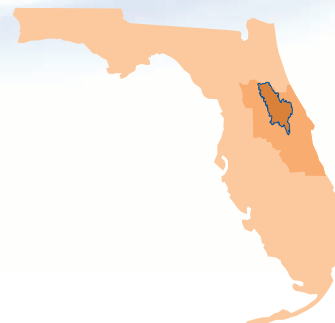
Table 4.3: Parameters Proposed for Delisting in the Middle St. Johns Basin (Waterbodies Placed on the 1998 303[d] List but Not Impaired under the Impaired Surface Waters Rule)

WBID	Waterbody Segment	Waterbody Type	Parameters for Delisting
Deep Creek Planning Unit			
2925	Deep Cr-Lk Ashby Ca	Blackwater	Total Coliforms
2964A	Lake Harney	Lake	Cadmium
Econlockhatchee River Planning Unit			
2991A	Econlockhatchee River	Stream	Nutrients, Fecal and/or Total Coliforms
3001	Little Econlockhatchee	Stream	Nutrients
Lake Monroe Planning Unit			
2962	Smith Canal	Stream	DO, Turbidity
Wekiva River Planning Unit			
2929A	Blackwater Creek	Stream	Cadmium, Zinc
2956C	Wekiwa Springs (Orange)	Spring	Nutrients, Total Coliforms
2967	Rock Springs Run	Spring	Nutrients, Fecal Coliforms
2993	Lake Prevatt	Lake	Fecal and Total Coliforms
3004	Little Wekiva Canal	Stream	Fecal Coliforms, Nutrients

Chapter 5: Data Needs and Strategic Monitoring Priorities

Chapter Summary

To verify the impairment of waterbody segments currently on the planning list, to collect data for TMDL development, and to assess segments of the basin with insufficient or no data, the Department will need to work with local entities to collect additional information through strategic monitoring. This chapter discusses potential existing sources of data and summarizes strategic monitoring priorities, needs, and requirements. It also describes the steps needed to develop a strategic monitoring plan.





Strategic Monitoring Priorities, Needs, and Requirements

Table 5.1 summarizes strategic monitoring priorities in the Middle St. Johns Basin, under the requirements of the impaired surface waters rule (IWR). For each potentially impaired waterbody or segment, the table lists priority categories for the 303(d) list and IWR, specific data needs, scheduled monitoring by the Department's Central District, and additional sources of water quality data.

Additional Sources of Data

Before carrying out strategic monitoring in the Middle St. Johns Basin to verify impairment and/or assess waterbody segments with insufficient or no data, the Department will need to explore potential sources of additional data. **Figure 5.1** shows local groups and other agencies that have collected data and/or are doing monitoring in the basin. The information in the table can be cross-referenced with **STORage** and **RETRetrieval** (STORET) database. If data are not available, the Department will work to ensure that the data are uploaded to STORET.

The Next Step: Developing a Strategic Monitoring Plan

A strategic monitoring plan will be developed and will serve as a guide for data-gathering activities in Phase 2 of the watershed management cycle. Considerations used in establishing priorities and a schedule for monitoring and data acquisition include the following:

- the need for data to meet the total maximum daily load (TMDL) development schedules imposed under the Consent Decree between the EPA and Earthjustice, discussed in Chapter 4, for certain waterbody segments;
- the need for data to verify waterbody status in support of time-critical watershed management actions under critical stakeholder programs;
- profound evidence of the need for ecological and/or water quality restoration; and
- logistical considerations in coordinating the monitoring and data-gathering roles of different groups.

Establishing a strategic monitoring plan for the Middle St. Johns Basin will require coordination between the various groups who monitor surface waters in the basin and consideration of the stakeholders who have an interest in the monitoring results.

Table 5.1: Interim Summary of Monitoring Activities in the Middle St. Johns Basin

WBID	Waterbody Segment	Date for TMDL Devel- opment Based on 1998 303(d) List	Department Priority for Phase 2 Strategic Monitoring	Monitoring Needs	Monitoring by Department's Central District	Monitoring by Other Groups
Alexander Springs Creek Planning Unit						
2918B	Buck Lake	2008	2	10 total coliform		
Deep Creek Planning Unit						
2893F	St Johns Riv Ab Lk Jesup		2	1 unionized ammonia		
2925	Deep Cr-Lk Ashby Ca	2008	2	metals/hardness		
2925A	Lake Ashby		2	3 iron		
2964	Underhill Slough		2	18 unionized ammonia		
2964A	Lake Harney	2008	2	metals/hardness		Seminole County
Econlockhatchee River Planning Unit						
2991	Econlockhatchee River		2	8 total coliform		Seminole County
2991A	Econlockhatchee River	2008	2	5 total coliform, 7 lead, 7 hardness, 4 chlorophyll <i>a</i>		Orange County, Seminole County
3001	Little Econlockhatchee	2008	2	5 chlorophyll <i>a</i>		Orange County, Seminole County
3003	Lake Pickett		1	complete for IWR analysis		
3014	Crane Strand Drain	2004	2	20 DO, 10 chlorophyll <i>a</i>	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
3019	Lake Tanner Outlet		2	4 chlorophyll <i>a</i> , TP, TN, and color		Orange County
3023	Crane Strand		2	6 total coliform		Orange County
3023A	Lake Baldwin		1	complete for IWR analysis		
3023B	Lake Barton		1	complete for IWR analysis		
3023C	Lake Susannah		1	color		
3024	Lake Downey		2	3 chlorophyll <i>a</i> , TP, TN, and color		Orange County
3024A	Trib To Ltl Econ Riv		2	9 DO		Orange County
3030	Long Branch	2004	2	20 total coliform, 20 fecal coliform, 20 DO, 10 chlorophyll <i>a</i> , 20 iron	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	

IWR—Impaired surface waters rule

TP—Total phosphorus

TN—Total nitrogen

DO—Dissolved oxygen

Table 5.1 (continued)

WBID	Waterbody Segment	Date for TMDL Development Based on 1998 303(d) List	Department Priority for Phase 2 Strategic Monitoring	Monitoring Needs	Monitoring by Department's Central District	Monitoring by Other Groups
Econlockhatchee River Planning Unit, continued						
3033C	Lake Corner		2	3 chlorophyll <i>a</i> , TP, TN, and color		Orange County
3033D	Lake Drawdy		2	3 chlorophyll <i>a</i> , TP, TN, and color		Orange County
3036	Lake Frederica		1	complete for IWR analysis		
3036A	Lake George		1	complete for IWR analysis		
3037	Unnamed Drain		2	12 DO		Orange County
Lake George Planning Unit						
2213O	St Johns Riv Ab Ocklawaha R		2	20 unionized ammonia, 10 chlorophyll <i>a</i>	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2893A	Lake George		1	complete for IWR analysis		
Lake Jesup Planning Unit						
2981	Lake Jesup	2004	2	1 unionized ammonia		Seminole County and SJRWMD
2984	Lake Nan		1	complete for IWR analysis		
2986	Soldier Creek Reach	2008	2	20 total coliform, 19 fecal coliform, 20 DO, 10 chlorophyll <i>a</i> , 20 lead, 20 silver, 20 hardness	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	Seminole County and SJRWMD
2994A	Gee Creek	2008	2	19 total coliform, 18 fecal coliform, 20 DO, 10 chlorophyll <i>a</i> , 20 lead, 20 silver, 20 hardness	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	Seminole County and SJRWMD
2994H	Lake Griffin		2	10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2994Y	Fruitwood Lake		2	10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
29977	Lake in the Woods		2	10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2997A	Howell Creek		1	14 DO		Seminole County and SJRWMD
2997C	Lake Maitland		2	8 unionized ammonia, 6 chlorophyll <i>a</i> , TN, TP, and color		Orange County

Table 5.1 (continued)

WBID	Waterbody Segment	Date for TMDL Development Based on 1998 303(d) List	Department Priority for Phase 2 Strategic Monitoring	Monitoring Needs	Monitoring by Department's Central District	Monitoring by Other Groups
Lake Jesup Planning Unit, continued						
2997D	Lake Minnehaha		2	7 chlorophyll <i>a</i> , TN, TP, and color		Orange County
2997E	Lake Osceola North		2	4 chlorophyll <i>a</i> , TP, TN, and color		Orange County
29970	Lake Osceola South		2	6 chlorophyll <i>a</i> , TP, TN, and color		Orange County
2997F	Lake Ivanhoe		1	complete for IWR analysis		
2997G	Lake Virginia		2	5 chlorophyll <i>a</i> , TN, TP, and color		Orange County
2997H	Lake Sue Outlet		2	20 unionized ammonia, 10 chlorophyll <i>a</i> , TP, TN, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2997H1	Lake Sue Outlet Nr Lak		2	20 unionized ammonia		
2997I	Lake Sue		2	6 chlorophyll <i>a</i> , TP, TN, and color		Orange County
2997J	Lake Rowena		1	complete for IWR analysis		
2997K	Lake Estelle		1	complete for IWR analysis		
2997L	Lake Winyah		2	12 unionized ammonia		
2997M	Lake Formosa		1	complete for IWR analysis		
2997N	Lake Highland		2	12 unionized ammonia		
2997P	Lake Concord		1	complete for IWR analysis		
2997Q	Lake Dot		2	12 unionized ammonia		
2997R	Lake Adair		2	9 unionized ammonia		
2997S	Lake Spring		2	16 unionized ammonia		
2997U	Lake Park		1	complete for IWR analysis		
2997X	Lake Killarney		2	4 chlorophyll <i>a</i> , TP, TN, and color		Orange County
2997Y	Lake Mizell		2	4 chlorophyll <i>a</i> , TP, TN, and color		Orange County
3009A	Waunatta Lake		2	9 DO		Orange County
3009C	Lake Burkett		1	complete for IWR analysis		
3009D	Deep Lake		2	10 DO, 5 chlorophyll <i>a</i> , TN, TP, and color		Orange County
3009E	Lake Georgia		2	10 DO		Orange County

Table 5.1 (continued)

WBID	Waterbody Segment	Date for TMDL Development Based on 1998 303(d) List	Department Priority for Phase 2 Strategic Monitoring	Monitoring Needs	Monitoring by Department's Central District	Monitoring by Other Groups
Lake Kerr Planning Unit						
2899	Little Lake Kerr Outlet		2	metals, hardness		
2899A	Hopkins Prairie		2	metals, hardness		
Lake Monroe Planning Unit						
2893C	St Johns Riv Ab Wekiva R.		1	complete for IWR analysis		Seminole County
2893D	Lake Monroe	2008	2	3 unionized ammonia, lead, selenium, and hardness		Seminole County
2893E	St Johns Riv Ab Lk Monroe	2008	1	complete for IWR analysis		
2953	Bethel Lake		2	10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2962	Smith Canal	2008	2	20 total coliform, 20 fecal coliform, 20 DO, 10 chlorophyll <i>a</i> , 20 iron	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2981A	Lake Jesup Nr St Johns Riv	2004	1	complete for IWR analysis		
Lake Woodruff Planning Unit						
28933	Volusia Blue Spring	2004	2	10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2893B	St Johns Riv Ab Lk Woodruff		1	complete for IWR analysis		
2893U	Lake Beresford		1	complete for IWR analysis		
2893Z	St Johns Riv Ab Lake George	2008	1	complete for IWR analysis		
2921	Lake Woodruff		1	complete for IWR analysis		
Wekiva River Planning Unit						
2929A	Blackwater Creek	2008	2	20 silver and hardness		Lake County
2956	Wekiva River		2	15 DO		Orange County
2956A	Wekiva River		2	2 DO		Orange County
2956B	Wekiva River Lower		1	complete for IWR analysis		
2956C	Wekiva Spring (Orange)	2004	2	15 total coliform, 15 fecal coliform, 8 DO, 10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	Orange County

Table 5.1 (continued)

WBID	Waterbody Segment	Date for TMDL Development Based on 1998 303(d) List	Department Priority for Phase 2 Strategic Monitoring	Monitoring Needs	Monitoring by Department's Central District	Monitoring by Other Groups
Wekiva River Planning Unit, continued						
2967	Rock Springs Run	2004	2	15 total coliform, 15 fecal coliform, 9 DO, 10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
2987	Little Wekiva River	2008	2	2 lead, 2 hardness		Seminole County
2993	Lake Prevatt	2008	2	5 chlorophyll <i>a</i> , TN, TP, and color		Orange County
2998B	Lake Mobile		1	color		
3002D	Starke Lake		2	10 unionized ammonia		
3002E	Lake Primavista		2	11 unionized ammonia		Orange County
3002H	Lake Sherwood		2	10 DO, 1 chlorophyll <i>a</i> , TN, TP, and color		Orange County
3002I	Lake Rose		2	7 chlorophyll <i>a</i> , TN, TP, and color		Orange County
3002J	Lake Hiawassee		2	4 chlorophyll <i>a</i> , TP, TN, and color		Orange County
3002K	Lake Olivia		1	color		
3004	Little Wekiva Canal	2008	2	7 total coliform, 7 fecal coliform, 10 chlorophyll <i>a</i>		Orange County
3004B	Lake Fairview		2	4 chlorophyll <i>a</i> , TP, TN, and color		Orange County
3004C	Lake Lawne		1	complete for IWR analysis		
3004D	Silver Lake		2	1 unionized ammonia		
3004E	Lake Daniel		2	12 unionized ammonia, color		
3004G	Bay Lake		2	12 unionized ammonia, 2 chlorophyll <i>a</i> , TN, TP, and color	2 chlorophyll <i>a</i> samples	
3004H	Little Lake Fairview		1	complete for IWR analysis		
3004I	Lake Rose		2	4 chlorophyll <i>a</i> , TP, TN, and color	4 samples during 4 quarters of 2002	
3004J	Lake Gandy		2	11 DO		Orange County
3004K	Lake Wekiva/ Orlando		2	20 unionized ammonia, 10 chlorophyll <i>a</i> , TN, TP, and color	minimum of 10 samples chlorophyll <i>a</i> during 5 trips in 2002	
3004N	Lake Fairview Lake		1	complete for IWR analysis		
3011A	Lake Weston		2	5 chlorophyll <i>a</i> , TN, TP, and color		Orange County

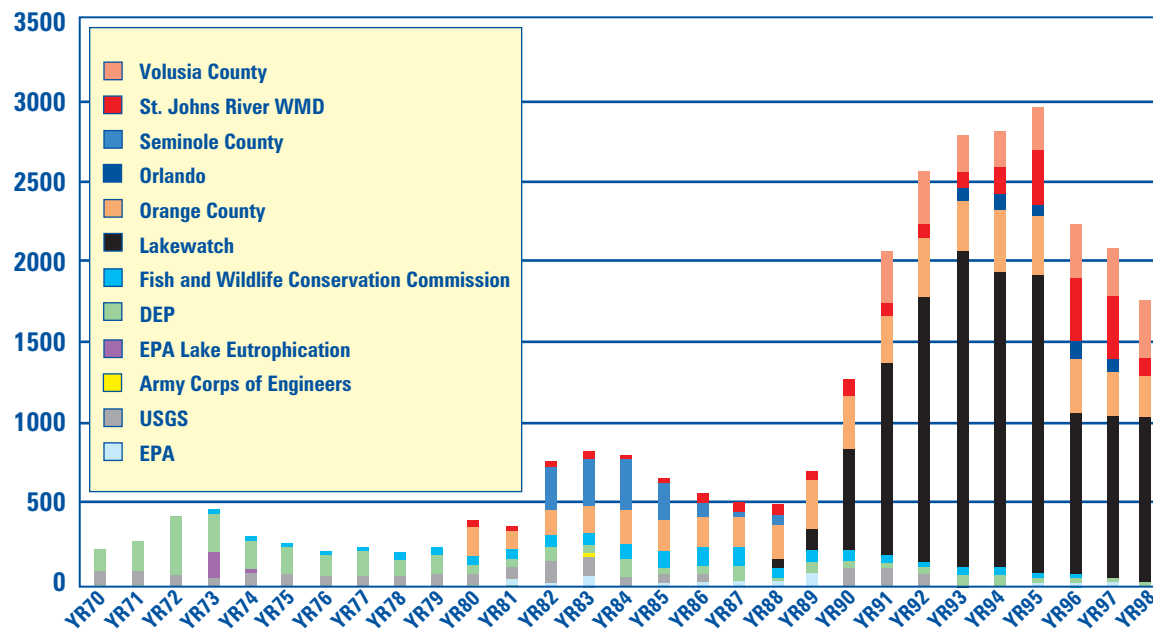
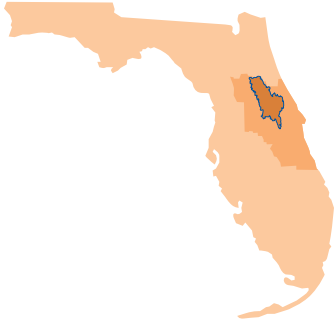


Figure 5.1: Agencies and Groups Carrying Out Monitoring in the Middle St. Johns Basin

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Appendix A: The Watershed Management Approach, TMDLs, and the Florida Watershed Restoration Act

Under the Department's watershed management approach, water resources are managed on the basis of natural boundaries, such as river basins, rather than political or regulatory boundaries; emphasis is placed on public involvement in decision making. Instead of focusing only on individual sources of pollution, water resources are assessed from a basinwide perspective that considers the cumulative effects of human activities. The approach is not new, nor does it compete with or replace existing programs. Rather than relying on single solutions to address aquatic 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.

The watershed management approach is the framework for implementing TMDLs as required by Section 303(d) of the federal Clean Water Act and the Florida Watershed Restoration Act. TMDLs must be developed for all waters that do not meet applicable water quality standards and are thus defined as "impaired waters."

SIDEBAR: SUMMARY OF CLEAN WATER ACT REQUIREMENTS RELATED TO THE TMDL PROGRAM

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). The TMDL program is an important step towards cleaning up our rivers. The Clean Water Act sets out the federal requirements that Florida must follow in implementing its TMDL program under the Florida Watershed Restoration Act. The Clean Water Act and the federal TMDL program include the following provisions:

- *Requires states to establish water quality standards that will protect the public health and welfare—33 U.S.C. § 1313(c)(2).*
- *Requires states to identify waters that do not meet applicable water quality standards (Water Quality Limited Segments, or WQLSs) and identify the pollutants causing the water quality threats—33 U.S.C. § 1313(d)(1)(A-B).*
- *Requires the state to establish for each WQLS the TMDL for each pollutant that can be introduced into that waterbody without violating water quality standards—33 U.S.C. § 1313(d)(1)(C).*
- *Requires that each TMDL be established "at a level necessary to implement the applicable water quality standards with seasonal variations and a margin of safety that takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality"—33 U.S.C. § 1313(d)(1)(C).*
- *Requires states to update their 303(d) list of impaired waters (WQLSs) every two years or else the U.S. Environmental Protection Agency (EPA) will be required to develop a complete WQLS list and/or TMDLs for the impaired waters on behalf of the state—33 U.S.C. § 1313(d)(2).*

- Requires EPA approval or disapproval within thirty days, once the WQLS list and TMDLs are submitted. If approved, the list and TMDLs are to be incorporated into the state's water quality management plan—33 U.S.C. § 1313(d)(2).

SIDEBAR: THE FLORIDA WATERSHED RESTORATION ACT

In recognition of the important role that TMDLs play in restoring state waters, the 1999 Florida legislature enacted the Florida Watershed Restoration Act. In addition to clarifying the Department's statutory authority to establish TMDLs, the act established a process for identifying and listing impaired waters and for developing TMDLs and the associated watershed management plans needed to allocate and achieve the needed pollutant load reductions. The legislation contains the following 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 basin-specific verified lists. 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 pollution 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, 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 the Florida Department of Agriculture and Consumer Services 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.*

As part of the Department's watershed management approach, TMDLs will be developed, and the corresponding load reductions allocated, as part of a watershed management cycle, which rotates through the state's fifty-two basins over a five-year cycle. Extensive public participation will be crucial throughout the cycle's five phases, as follows:

- **Phase 1: Watershed Evaluation.** The Department will conduct preliminary evaluations of the status of the quality of surface water and ground water. This information will be used to generate a planning list of potentially impaired waters for which TMDLs may be needed. At the end of Phase 1, a strategic monitoring plan will be developed.
- **Phase 2: Strategic Monitoring.** Monitoring will be conducted to help verify whether waters are, in fact, impaired and to collect the data needed to calibrate and verify models for TMDL development. At the end of the second phase, an Assessment Report will be produced. This report will contain an updated and more thorough assessment of water quality, associated biological resources, and current restoration plans and projects. Waters that are verified as being impaired will be placed on a basin-specific list of impaired waters that will be adopted by the Department through a Secretarial Order. This verified list will be submitted to the U.S. Environmental Protection Agency as the state's Section 303(d) list of impaired waters for the basin.
- **Phase 3: Developing and Adopting TMDLs.** TMDLs for priority impaired waters in the watershed 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 impaired surface waters rule (Identification of Impaired Surface Waters Rule, Section 62-303, Florida Administrative Code).
- **Phase 4: Developing Watershed Management Plans.** A watershed management plan will be developed specifying how pollutant loadings from point and nonpoint sources of pollution will be allocated and reduced, in order to meet TMDL requirements. The plans will include regulatory and nonregulatory (i.e., voluntary), structural and nonstructural improvements. The involvement and support of affected stakeholders in this phase will be especially critical.
- **Phase 5: Implementing Watershed Management Plans.** Implementation of the activities specified in the watershed management plan will begin.

The watershed management approach is an iterative 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 will also track the implementation of scheduled restoration activities, whether required or voluntary, to ensure continued progress towards meeting the TMDLs.

This approach is intended to protect and enhance the ecological structure, function, and integrity of Florida's watersheds by promoting the management of entire natural systems and addressing the cumulative effects of human activities on a watershed basis. The approach 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.

Appendix B: Ecological Resources in the Middle St. Johns Basin

Table B-1: Areas and Descriptions of Natural Communities in the Middle St. Johns Basin
(Community descriptions are adapted from Cox *et al.*, 1994)

Community Type	Acres	Percent of Basin Area	Community Description
Uplands			
Dry prairie	54,096.80	4.15%	These large native grass and shrub communities are found on flat terrain intermixed with cypress swamps, bayheads, freshwater marshes, and hardwood hammocks. This class includes palmetto prairies, which are pine flatwoods where the overstory has been removed.
Pinelands	170,375.99	13.08%	Pinelands occur on flat, sandy terrain. Dominant overstory trees are longleaf pine, slash pine, or pond pine. This community includes pine plantations. Fire is a major source of natural disturbance. Dominance by longleaf pine occurs on drier, well-drained sites. Pond pine occur on poorly drained sites, and slash pond occur on intermediate or moderately wet sites.
Sand pine scrub	103,385.55	7.94%	Sand pine scrub, a very dry community, occurs on extremely well-drained, sterile sands deposited along ridges or former dunes. This community is dominated by an overstory of sand pine with an understory of myrtle oak, Chapman's oak, sand live oak, and scrub holly. Ground cover is usually sparse. Fire is an important land management tool that results in even-aged stands within regenerated sites.
Sandhill	40,365.38	3.10%	Sandhill communities occur on rolling terrain with deep, well-drained, dry sandy soils. The overstory is dominated by longleaf pine, with an understory of turkey oak and bluejack oak. Fire is important for the control of hardwood species and continued generation of the sandhill community.
Xeric oak scrub	41,532.18	3.19%	This community occurs in areas of deep sands. It comprises clumped patches of low-growing xeric oak species. Common species are myrtle oak, scrub plum, sand live oak, Chapman's oak, and saw palmetto. Fire is an important factor in maintaining oak scrub.
Mixed pine-hardwood forest	23,947.90	1.84%	This community contains a relatively equal mix of hardwood and pine species. Common tree species are beech, mockernut hickory, water oak, loblolly pine, dogwood, slash pine, longleaf pine, and live oak.
Hardwood hammock and forest	81,826.79	6.28%	These major upland hardwood-dominated associations are found on fairly rich sandy soils. They can occur across a range of soil moisture conditions, including hydric, mesic, and xeric.

Table B-1 (continued)

Community Type	Acres	Percent of Basin Area	Community Description
Wetlands and Open Water			
Freshwater marsh and wet prairie	42,948.56	3.30%	These communities are dominated by herbaceous plant species growing on sand, clay, marl, or organic soils. Common species are pickerel weed, spatterdock, cattail, and sawgrass. Water depths and inundation regimes vary. Generally, freshwater marshes occur in deeper areas that are inundated longer and are characterized by tall emergents and floating-leafed species. This category also includes portions of freshwater lakes, rivers, and canals that are dominated by floating-leafed plants. Wet prairies commonly occur in shallow, periodically inundated areas or are found in scattered shallow depressions within dry prairies. They are usually dominated by aquatic grasses, sedges, and their associates.
Cypress swamp	51,176.87	3.93%	The dominant overstory tree is either pond or bald cypress. This community is found along the borders of large rivers, creeks, and lakes or in isolated depressions.
Mixed hardwood swamp	121,416.26	9.32%	These swamps occur as either stands of hardwoods or a mix of hardwoods and cypress. Overstory tree species are black gum, water tupelo, bald cypress, dahoon holly, cabbage palm, red maple, or sweetbay. Swamps are commonly found on organic soils along floodplains of nonalluvial rivers, creeks, and lakes.
Bay swamp	17,030.29	1.31%	The dominant vegetation consists of broadleaf evergreen hardwoods, including sweetbay, swamp bay, and loblolly bay. This community occurs in shallow depressions or at the base of sandy ridges where seepage keeps the soil wet. Soils are usually acidic peat or muck.
Shrub swamp	21,622.74	1.66%	Shrub swamps are dominated by dense, woody shrubs or small trees. Some common species are willow, wax myrtle, buttonbush, and saplings of red maple, black gum, or other wooded wetland species. Shrub swamps can be indicative of wetlands experiencing environmental change.
Open water	117,897.81	9.05%	Lakes and streams
Disturbed Lands			
Grassland / agricultural land	114,979.28	8.83%	These upland communities consist of very low-growing grasses and forbs. They are usually found on intensively managed sites such as improved pastures, lawns, golf courses, road shoulders, cemeteries, or weedy, fallow agricultural fields. This early successional category includes all sites with herbaceous vegetation between the stages of bare ground and shrub and brush, as well as all agricultural fields.
Shrub and brush land	181,894.73	13.96%	Shrub and brush land includes natural upland communities that have been recently disturbed (such as clear-cutting commercial pinelands, land clearing, or fire) and are recovering through natural successional processes. It is characterized as an early stage of succession for old fields, dominated by various shrubs, tree saplings, and lesser amounts of grasses and herbs.
Barren land	118,027.40	9.06%	Highly reflective areas such as roads, beaches, strip mines, tilled agricultural sites, and cleared land are included as barren land. Unvegetated urban areas are also included. Vegetated tracts within urban areas are mapped by their predominate vegetative cover.

Table B-2: Percent Area of Natural Communities by Planning Unit

Community Type	Alexander Springs Creek	Deep Creek	Econlock-hatchee River	Lake George	Lake Jesup	Lake Kerr	Lake Monroe	Lake Woodruff	Wekiva River
Dry prairie	0	9.64	19.73	0.24	0.44	0	1.22	0.65	0
Pinelands	10.65	23.37	14.08	18.38	6.49	2.03	4.66	15.36	11.52
Sand pine scrub	33.35	1.18	0.54	4.02	0.32	47.08	5.87	3.66	1.53
Sandhill	18.53	0.63	0.21	1.42	0	11.09	0.87	0.69	3.76
Xeric oak scrub	5.44	1.26	1.05	1.34	0.83	19.21	1.99	2.57	0.64
Mixed hardwood pine	1.13	3.64	0.06	1.97	0.52	2.91	1.05	1.75	2.21
Hardwood hammock	3.22	3.89	4.17	8.30	10.69	1.42	8.95	7.50	7.83
Freshwater marsh	2.54	3.44	2.37	2.80	4.67	3.28	6.73	4.69	1.67
Cypress swamp	0	13.78	11.76	0.93	1.27	0.9	1.17	0.98	0.06
Hardwood swamp	8.59	4.98	5.40	7.35	7.18	1.19	3.00	22.44	14.17
Bay swamp	1.30	2.36	2.48	0.61	0.39	0	0.17	2.53	0.72
Shrub swamp	0.16	2.16	0.14	0.39	1.75	0.26	4.41	5.47	0.54
Open water	2.95	5.06	2.22	32.64	13.40	3.88	16.40	5.46	3.81
Grassland and agriculture	0.65	6.50	13.66	3.66	19.30	0.09	13.91	6.42	12.77
Shrub and brush	9.03	14.5	8.39	12.32	11.05	4.09	15.09	15.69	23.97
Barren land	2.46	3.60	13.73	3.64	21.69	2.58	14.52	4.13	14.80

Table B-3: Rare and Protected Plant and Animal Species in the Alexander Springs Creek Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
CHAPMAN'S SEDGE	<i>CAREX CHAPMANII</i>	G3	S3	N	LE
FLORIDA BONAMIA	<i>BONAMIA GRANDIFLORA</i>	G3	S3	LT	LE
OCALA VETCH	<i>VICIA OCALENSIS</i>	G1	S1	N	LE
PIEDMONT JOINTGRASS	<i>COELORACHIS TUBERCULOSA</i>	G3	S3	MC	LT
PINESAP	<i>MONOTROPA HYPOPITHYS</i>	G5	S1	N	LE
SCRUB BAY	<i>PERSEA HUMILIS</i>	G3	S3	N	N
SCRUB HOLLY	<i>ILEX OPACA</i> VAR <i>ARENICOLA</i>	G5T3	S3	N	N
STAR ANISE	<i>ILLICIAM PARVIFLORUM</i>	G2	S2	MC	LE
Animal Species					
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
BIG-CHEEKED CAVE CRAYFISH	<i>PROCAMBARUS DELICATUS</i>	G1	S1	N	N
BLUENOSE SHINER	<i>PTERONOTROPIS WELAKA</i>	G4	S4	N	LS
DENSE HYDROBE	<i>APHAOSTRACON PYCNUM</i>	G1	S1	N	N
EASTERN DIAMONDBACK RATTLESNAKE	<i>CROTALUS ADAMANTEUS</i>	G4	S3	N	N
EASTERN INDIGO SNAKE	<i>DRYMARCHON CORAIS COUPERI</i>	G4T3	S3	LT	LT
FLORIDA BLACK BEAR	<i>URSUS AMERICANUS FLORIDANUS</i>	G5T2	S2	N	LT
FLORIDA PINE SNAKE	<i>PITUOPHIS MELANOLEUCUS MUGITUS</i>	G4T3?	S3	N	LS
FLORIDA SANDHILL CRANE	<i>GRUS CANADENSIS PRATENSIS</i>	G5T2T3	S2S3	N	LT
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER FROG	<i>RANA CAPITO</i>	G3G4	S3	N	LS
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
LIMPKIN	<i>ARAMUS GUARAUNA</i>	G5	S3	N	LS

Table B-4: Rare and Protected Plant and Animal Species in the Deep Creek Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
CELESTIAL LILY	<i>NEMASTYLIS FLORIDANA</i>	G2	S2	MC	LE
CURTISS' MILKWEED	<i>ASCLEPIAS CURTISSII</i>	G3	S3	N	LE
LARGE-FLOWERED ROSEMARY	<i>CONRADINA GRANDIFLORA</i>	G3	S3	N	LT
NODDING PINWEED	<i>LECHEA CERNUA</i>	G3	S3	N	LT
RUGEL'S PAWPAW	<i>DEERINGOTHAMNUS RUGELII</i>	G1	S1	LE	LE
SCRUB BAY	<i>PERSEA HUMILIS</i>	G3	S3	N	N
SCRUB HOLLY	<i>ILEX OPACA VAR ARENICOLA</i>	G5T3	S3	N	N
Animal Species					
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
FLORIDA LONG-TAILED WEASEL	<i>MUSTELA FRENATA PENINSULAE</i>	G5T3	S3	N	N
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
SNAIL BULLHEAD	<i>AMEIURUS BRUNNEUS</i>	G4	S3	N	N

Table B-5: Rare and Protected Plant and Animal Species in the Econlockhatchee River Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
BEAUTIFUL PAWPAW	<i>DEERINGOTHAMNUS PULCHELLUS</i>	G1	S1	LE	LE
FLORIDA BEARGRASS	<i>NOLINA ATOPOCARPA</i>	G3	S3	MC	LT
GIANT ORCHID	<i>PTEROGLOSSASPIS ECRISTATA</i>	G2	S2	MC	LT
HAND FERN	<i>OPHIOGLOSSUM PALMATUM</i>	G4	S2	N	LE
NODDING PINWEED	<i>LECHEA CERNUA</i>	G3	S3	N	LT
SCRUB HOLLY	<i>ILEX OPACA VAR ARENICOLA</i>	G5T3	S3	N	N
Animal Species					
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
EASTERN INDIGO SNAKE	<i>DRYMARCHON CORAIS COUPERI</i>	G4T3	S3	LT	LT
FLORIDA LONG-TAILED WEASEL	<i>MUSTELA FRENATA PENINSULAE</i>	G5T3	S3	N	N
FLORIDA MOUSE	<i>PODOMYS FLORIDANUS</i>	G3	S3	N	LS
FLORIDA SANDHILL CRANE	<i>GRUS CANADENSIS PRATENSIS</i>	G5T2T3	S2S3	N	LT
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
RED-CKCKADED WOODPECKER	<i>PICOIDES BOREALIS</i>	G3	S2	LE	LT
STRIPED NEWT	<i>NOTOPHTHALMUS PERSTRIATUS</i>	G2G3	S2S3	N	N

Table B-6: Rare and Protected Plant and Animal Species in the Lake George Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
CELESTIAL LILY	<i>NEMASTYLIS FLORIDANA</i>	G2	S2	MC	LE
CHAFFSEED	<i>SCHWALBEA AMERICANA</i>	G2	S1	LE	LE
CURTISS' MILKWEED	<i>ASCLEPIAS CURTISSII</i>	G3	S3	N	LE
OCALA VETCH	<i>VICIA OCALENSIS</i>	G1	S1	N	LE
PONDSPICE	<i>LITSEA AESTIVALIS</i>	G3	S2	MC	LE
SCRUB BAY	<i>PERSEA HUMILIS</i>	G3	S3	N	N
Animal Species					
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
BLUENOSE SHINER	<i>PTERONOTROPIS WELAKA</i>	G4	S4	N	LS
EASTERN DIAMONDBACK RATTLESNAKE	<i>CROTALUS ADAMANTEUS</i>	G4	S3	N	N
EASTERN INDIGO SNAKE	<i>DRYMARCHON CORAIS COUPERI</i>	G4T3	S3	LT	LT
FLORIDA BLACK BEAR	<i>URSUS AMERICANUS FLORIDANUS</i>	G5T2	S2	N	LT
FLORIDA SCRUB LIZARD	<i>SCELOPORUS WOODI</i>	G3	S3	N	N
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
SCRUB TIGER BEETLE	<i>CICINDELA SCABROSA</i>	G3	S3	N	N
SILVER GLEN SPRINGS CRAYFISH	<i>PROCAMBARUS ATTIGUUS</i>	G1	S1	N	N
SOUTHEASTERN WEASEL	<i>MUSTELA FRENATA OLIVACEA</i>	G5T4	S3?	N	N

Table B-7: Rare and Protected Plant and Animal Species in the Lake Jesup Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
FLORIDA WILLOW	<i>SALIX FLORIDANA</i>	G2	S2	MC	LE
HAY SCENTED FERN	<i>DENNSTAEDTIA BIPINNATA</i>	G4	S1	N	LE
SCRUB BAY	<i>PERSEA HUMILIS</i>	G3	S3	N	N
Animal Species					
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
CLIFTON SPRINGS HYDROBE	<i>APHAOSTRACON THEIOCRENETUM</i>	G1	S1	N	N
EASTERN INDIGO SNAKE	<i>DRYMARCHON CORAIS COUPERI</i>	G4T3	S3	LT	LT
FLORIDA LONG-TAILED WEASEL	<i>MUSTELA FRENATA PENINSULAE</i>	G5T3	S3	N	N

Table B-8: Rare and Protected Plant and Animal Species in the Lake Kerr Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
ASHE'S SAVORY	<i>CALAMINTHA ASHEI</i>	G3	S3	MC	LT
BUCKTHORN	<i>SIDEROXYLON LYCIOIDES</i>	G5	S2	N	LE
CHAPMAN'S SEDGE	<i>CAREX CHAPMANII</i>	G3	S3	N	LE
CURTISS' MILKWEED	<i>ASCLEPIAS CURTISSII</i>	G3	S3	N	LE
FLORIDA BEARGRASS	<i>NOLINA ATOPOCARPA</i>	G3	S3	MC	LT
FLORIDA BONAMIA	<i>BONAMIA GRANDIFLORA</i>	G3	S3	LT	LE
FLORIDA WILLOW	<i>SALIX FLORIDANA</i>	G2	S2	MC	LE
HARTWRIGHTIA	<i>HARTWRIGHTIA FLORIDANA</i>	G2	S2	N	LT
LARGE-LEAVED GRASS-OF-PARNASSUS	<i>PARNASSIA GRANDIFOLIA</i>	G3	S2	N	LE
LEWTON'S POLYGALA	<i>POLYGALA LEWTONII</i>	G3	S3	LE	LE
NARROWLEAF NAIAD	<i>NAJAS FILIFOLIA</i>	G1	S1	N	LT
OCALA VETCH	<i>VICIA OCALENSIS</i>	G1	S1	N	LE
PIGMY PIPES	<i>MONOTROPSIS REYNOLDSIAE</i>	G1Q	S1	N	LE
PINESAP	<i>MONOTROPA HYPOPITHYS</i>	G5	S1	N	LE
SCRUB HOLLY	<i>ILEX OPACA VAR ARENICOLA</i>	G5T3	S3	N	N
SCRUB STYLISMA	<i>STYLISMA ABDITA</i>	G3	S3	N	LE
STAR ANISE	<i>ILLICIAM PARVIFLORUM</i>	G2	S2	MC	LE
Animal Species					
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
BLACK-CROWNED NIGHT-HERON	<i>NYCTICORAX NYCTICORAX</i>	G5	S3?	N	N
EASTERN DIAMONDBACK RATTLESNAKE	<i>CROTALUS ADAMANTEUS</i>	G4	S3	N	N
EASTERN INDIGO SNAKE	<i>DRYMARCHON CORAIS COUPERI</i>	G4T3	S3	LT	LT
FLORIDA BLACK BEAR	<i>URSUS AMERICANUS FLORIDANUS</i>	G5T2	S2	N	LT
FLORIDA PINE SNAKE	<i>PITUOPHIS MELANOLEUCUS MUGITUS</i>	G4T3?	S3	N	LS
FLORIDA SCRUB LIZARD	<i>SCELOPORUS WOODI</i>	G3	S3	N	N
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER FROG	<i>RANA CAPITO</i>	G3G4	S3	N	LS
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
GREAT EGRET	<i>ARDEA ALBA</i>	G5	S4	N	N

Table B-8 (continued)

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
LITTLE BLUE HERON	<i>EGRETTA CAERULEA</i>	G5	S4	N	LS
RED-COCKADED WOODPECKER	<i>PICOIDES BOREALIS</i>	G3	S2	LE	LT
ROUND-TAILED MUSKRAT	<i>NEOFIBER ALLENI</i>	G3	S3	N	N
SAND SKINK	<i>NEOSEPS REYNOLDSI</i>	G2	S2	LT	LT
SHERMAN'S FOX SQUIRREL	<i>SCIURUS NIGER SHERMANI</i>	G5T3	S3	N	LS
SHORT-TAILED SNAKE	<i>STILOSONA EXTENUATUM</i>	G3	S3	N	LT
SNOWY EGRET	<i>EGRETTA THULA</i>	G5	S3	N	LS
SOUTHEASTERN AMERICAN KESTREL	<i>FALCO SPARVERIUS PAULUS</i>	G5T4	S3	N	LT
STRIPED NEWT	<i>NOTOPHTHALMUS PERSTRIATUS</i>	G2G3	S2S3	N	N
SWALLOW-TAILED KITE	<i>ELANOIDES FORFICATUS</i>	G5	S2		

Table B-9: Rare and Protected Plant and Animal Species in the Lake Monroe Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
CELESTIAL LILY	<i>NEMASTYLIS FLORIDANA</i>	G2	S2	MC	LE
CURTISS' MILKWEED	<i>ASCLEPIAS CURTISSII</i>	G3	S3	N	LE
GIANT ORCHID	<i>PTEROGLOSSASPIS ECRISTATA</i>	G2	S2	MC	LT
NODDING PINWEED	<i>LECHEA CERNUA</i>	G3	S3	N	LT
SCRUB BAY	<i>PERSEA HUMILIS</i>	G3	S3	N	N
SCRUB HOLLY	<i>ILEX OPACA VAR ARENICOLA</i>	G5T3	S3	N	N
Animal Species					
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
ENTERPRISE SILTSNAIL	<i>CINCINNATIA MONROENSIS</i>	G1	S1	N	N
FLORIDA LONG-TAILED WEASEL	<i>MUSTELA FRENATA PENINSULAE</i>	G5T3	S3	N	N
FLORIDA PINE SNAKE	<i>PITUOPHIS MELANOLEUCUS MUGITUS</i>	G4T3?	S3	N	LS
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
LEAST TERN	<i>STERNA ANTILLARUM</i>	G4	S3	N	LT

Table B-10: Rare and Protected Plant and Animal Species in the Lake Woodruff Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Rank
Plant Species					
CELESTIAL LILY	<i>NEMASTYLIS FLORIDANA</i>	G2	S2	MC	LE
CHAPMAN'S SEDGE	<i>CAREX CHAPMANII</i>	G3	S3	N	LE
CURTISS' MILKWEED	<i>ASCLEPIAS CURTISSII</i>	G3	S3	N	LE
LARGE-FLOWERED ROSEMARY	<i>CONRADINA GRANDIFLORA</i>	G3	S3	N	LT
OKEECHOBEE GOURD	<i>CUCURBITA OKEECHOBENSIS SSP OKEECHOBENSIS</i>	G5T1	S1	LE	LE
PIEDMONT JOINTGRASS	<i>COELORACHIS TUBERCULOSA</i>	G3	S3	MC	LT
SCRUB BAY	<i>PERSEA HUMILIS</i>	G3	S3	N	N
SCRUB HOLLY	<i>ILEX OPACA VAR ARENICOLA</i>	G5T3	S3	N	N
STAR ANISE	<i>ILICIIUM PARVIFLORUM</i>	G2	S2	MC	LE
Animal Species					
AMERICAN ALLIGATOR	<i>ALLIGATOR MISSISSIPPIENSIS</i>	G5	S4	T(S/A)	LS
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
BLACK RAIL	<i>LATERALLUS JAMAICENSIS</i>	G4	S3	N	N
BLUE SPRING HYDROBE	<i>APHAOSTRACON ASTHENES</i>	G1	S1	N	N
BLUE SPRING SILTSNAIL	<i>CINCINNATIA PARVA</i>	GX	S1	N	N
EASTERN DIAMONDBACK RATTLESNAKE	<i>CROTALUS ADAMANTEUS</i>	G4	S3	N	N
FLORIDA BLACK BEAR	<i>URSUS AMERICANUS FLORIDANUS</i>	G5T2	S2	N	LT
FLORIDA PINE SNAKE	<i>PITUOPHIS MELANOLEUCUS MUGITUS</i>	G4T3?	S3	N	LS
FLORIDA SANDHILL CRANE	<i>GRUS CANADENSIS PRATENSIS</i>	G5T2T3	S2S3	N	LT
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER FROG	<i>RANA CAPITO</i>	G3G4	S3	N	LS
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
GREAT EGRET	<i>ARDEA ALBA</i>	G5	S4	N	N
LIMPKIN	<i>ARAMUS GUARAUNA</i>	G5	S3	N	LS
LITTLE BLUE HERON	<i>EGRETTA CAERULEA</i>	G5	S4	N	LS
OSPREY	<i>PANDION HALIAEETUS</i>	G5	S3S4	N	N
RED-CKADEED WOODPECKER	<i>PICOIDES BOREALIS</i>	G3	S2	LE	LT
SOUTHEASTERN AMERICAN KESTREL	<i>FALCO SPARVERIUS PAULUS</i>	G5T4	S3	N	LT

Table B-11: Rare and Protected Plant and Animal Species in the Wekiva River Planning Unit

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
Plant Species					
CHAPMAN'S SEDGE	<i>CAREX CHAPMANII</i>	G3	S3	N	LE
CURTISS' MILKWEED	<i>ASCLEPIAS CURTISSII</i>	G3	S3	N	LE
FLORIDA HASTEOLA	<i>HASTEOLA ROBERTIORUM</i>	G1	S1	N	LE
FLORIDA WILLOW	<i>SALIX FLORIDANA</i>	G2	S2	MC	LE
GIANT ORCHID	<i>PTEROGLOSSASPIS ECRISTATA</i>	G2	S2	MC	LT
HARTWRIGHTIA	<i>HARTWRIGHTIA FLORIDANA</i>	G2	S2	N	LT
NODDING PINWEED	<i>LECHEA CERNUA</i>	G3	S3	N	LT
PIEDMONT JOINTGRASS	<i>COELORACHIS TUBERCULOSA</i>	G3	S3	MC	LT
PINESAP	<i>MONOTROPA HYPOPIETHYS</i>	G5	S1	N	LE
SAND BUTTERFLY PEA	<i>CENTROSEMA ARENICOLA</i>	G2Q	S2	MC	LE
SCRUB BAY	<i>PERSEA HUMILIS</i>	G3	S3	N	N
SCRUB BUCKWHEAT	<i>ERIOGONUM LONGIFOLIUM</i> VAR <i>GNAPHALIFOLIUM</i>	G4T3	S3	LT	LE
SCRUB LUPINE	<i>LUPINUS WESTIANUS</i> VAR <i>ARIDORUM</i>	G2T1	S1	LE	LE
SCRUB STYLISMA	<i>STYLISMA ABDITA</i>	G3	S3	N	LE
STAR ANISE	<i>ILICIIUM PARVIFLORUM</i>	G2	S2	MC	LE
Animal Species					
AMERICAN ALLIGATOR	<i>ALLIGATOR MISSISSIPPIENSIS</i>	G5	S4	T(S/A)	LS
BALD EAGLE	<i>HALIAEETUS LEUCOCEPHALUS</i>	G4	S3	LT	LT
BLACKBANDED SUNFISH	<i>ENNEACANTHUS CHAETODON</i>	G4	S3	N	N
BLUENOSE SHINER	<i>PTERONOTROPIS WELAKA</i>	G4	S4	N	LS
EASTERN DIAMONDBACK RATTLESNAKE	<i>CROTALUS ADAMANTEUS</i>	G4	S3	N	N
EASTERN INDIGO SNAKE	<i>DRYMARCHON CORAIS COUPERI</i>	G4T3	S3	LT	LT

Table B-11 (continued)

Common Name	Scientific Name	Global Rank	State Rank	Federal Status	State Status
FLORIDA BLACK BEAR	<i>URSUS AMERICANUS FLORIDANUS</i>	G5T2	S2	N	LT
FLORIDA BURROWING OWL	<i>ATHENE CUNICULARIA FLORIDANA</i>	G4T3	S3	N	LS
FLORIDA MOUSE	<i>PODOMYS FLORIDANUS</i>	G3	S3	N	LS
FLORIDA SANDHILL CRANE	<i>GRUS CANADENSIS PRATENSIS</i>	G5T2T3	S2S3	N	LT
FLORIDA SCRUB LIZARD	<i>SCELOPORUS WOODI</i>	G3	S3	N	N
FLORIDA SCRUB-JAY	<i>APHELOCOMA COERULESCENS</i>	G3	S3	LT	LT
GOPHER FROG	<i>RANA CAPITO</i>	G3G4	S3	N	LS
GOPHER TORTOISE	<i>GOPHERUS POLYPHEMUS</i>	G3	S3	N	LS
LIMPKIN	<i>ARAMUS GUARAUNA</i>	G5	S3	N	LS
LITTLE BLUE HERON	<i>EGRETTA CAERULEA</i>	G5	S4	N	LS
ORLANDO CAVE CRAYFISH	<i>PROCAMBARUS ACHERONTIS</i>	G1G2	S1	N	N
ORLANDO SPIDER CAVE CRAYFISH	<i>TROGLOCAMBARUS SP 1</i>	G1	S?	N	N
OSPREY	<i>PANDION HALIAETUS</i>	G5	S3S4	N	N
RED-COCKADED WOODPECKER	<i>PICOIDES BOREALIS</i>	G3	S2	LE	LT
ROCK SPRINGS CAVE ISOPOD	<i>CAECIDOTEA SP 1</i>	G1	S1	N	N
SANLANDO SPRING SILTSNAIL	<i>CINCINNATIA PONDEROSA</i>	G1	S1	N	N
SEMINOLE SPRING SILTSNAIL	<i>CINCINNATIA VANHYNINGI</i>	G1	S1	N	N
SHERMAN'S FOX SQUIRREL	<i>SCIURUS NIGER SHERMANI</i>	G5T3	S3	N	LS
SHORT-TAILED HAWK	<i>BUTEO BRACHYURUS</i>	G4G5	S1	N	N
SHORT-TAILED SNAKE	<i>STILOSOMA EXTENUATUM</i>	G3	S3	N	LT
SNAIL BULLHEAD	<i>AMEIURUS BRUNNEUS</i>	G4	S3	N	N
WEKIWA HYDROBE	<i>APHAOSTRACON MONAS</i>	G1	S1	N	N
WEKIWA SILTSNAIL	<i>CINCINNATIA WEKIWAE</i>	G1	S1	N	N
WHITE IBIS	<i>EUDOCIMUS ALBUS</i>	G5	S4	N	LS
WOOD STORK	<i>MYCTERIA AMERICANA</i>	G4	S2	LE	LE

Table B-12: Definitions of Codes Used for Plant and Animal Species Listed in Tables B-3 through B-11.

Federal designation for both plant and animal	State designation	FNAI global and state rank designation
N – not listed LE – endangered LT – threatened T(S/A) – threatened due to similarity of appearance MC – plant is of management concern	Plants N – not listed LE – endangered LT – threatened Animals LE – endangered LT – threatened LS – species of special concern	G1 or S1 – Critically imperiled globally or in Florida because of extreme rarity (less than 1,000 individuals or 5 or fewer occurrences) or extreme vulnerability to extinction. G2 or S2 – Imperiled globally or in Florida because of rarity (6 to 20 occurrences or less than 3,000 individuals) or vulnerability to extinction. G3 or S3 – Very rare or local throughout range (21 to 100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction. G4 or S4 – Apparently secure globally and in Florida, but may be rare in parts of range. G5 or S5 – Demonstrably secure globally or in Florida. G#G# or S#S# - Range of rank, because insufficient data to assign specific rank. G#? or S#? – Tentative rank G#T# or S#T# - Rank of a taxonomic subgroup such as a subspecies or variety. G or S portion of rank refers to the entire species and the T portion refers to the specific subgroup rank. G#Q or S#Q – Rank of questionable species, because of confusion over whether it is a species or subspecies. G#T#Q – Rank of questionable subspecies, because validity of subspecies is questioned.

Table B-13: Characteristics of Lake Ecoregions in the Middle St. Johns Basin

Ecoregion	Description
Ocala Scrub	This region contains ancient sand dunes with excessively drained, deep, sandy soils and sand pine scrub forest. Common soil series are Candler and Astatula. The Ocala Scrub contains acid, mostly clear lakes with low nutrient levels. Clear lakes are found on higher sandy ridges.
Eastern Flatlands	The Eastern Flatlands is a diverse lake region because of the variability of landforms and its latitudinal extent. Most landforms parallel the coast and reflect the marine forces that controlled their shape and formation. Ancient barrier islands, lagoons, dune ridges, spits, and sandbars have left the current region ribbed by low sand ridges and intervening valleys and swampy lowlands. The lake chains of the St. Johns River are the dominant features. North of Lake Harney, river vegetation changes from wet grassland prairies to hardwood swamp forests. The ecoregion contains a mix of different lake types. The lakes that make up the St. Johns River—which include Harney, Jesup, Monroe, and George—are generally alkaline, hardwater, eutrophic, and colored. Inputs of mineralized water from salt springs and marine sediments influence the chemistry of these lakes. Other flatwoods lakes are acid to slightly acid, colored softwater lakes of moderate mineral content with variable trophic states.
Crescent City/DeLand Ridges	The ecoregion contains several sandy upland ridges. The thick sand soil that makes up the parent material for these ridges is deeply weathered Plio-Pleistocene coastal sand deposits. Candler and Astatula are the typical soil series. Most natural vegetation consists of longleaf pine/xerophytic oak forests and some areas of pine scrub forests. Lakes that have formed on lowland type soils may be more characteristic of the smaller darkwater lakes of the Eastern Flatwoods. Many other lakes are clear, acid, and oligotrophic with low mineral content and derive most of their flow from rainfall and subsurface inflows.
Mt. Dora Ridge	The ridge extends from near the Lake/Marion County border near Altoona south to the towns of Eustis and Mount Dora. It contains high sand hills, 75 to 180 feet in elevation, with excessively drained to well-drained sandy soils. Many small, circumneutral, clear lakes with low color, low nutrients, low chlorophyll, and moderate to high alkalinity dot the landscape. Steeply sloping sandhills and old orange groves surround the lakes.
Apopka Upland	This is a region of residual sandhills modified by karst processes, with many small lakes and scattered sinkholes. Elevations range from 70 to 150 feet. Longleaf pine and xerophytic oaks would have been the natural vegetation, although most have been replaced with citrus, pasture, and urban/residential development. The physical and chemical characteristics of the lakes are varied. Some lakes are acid, clear, softwater lakes of low mineral content; some clear lakes have moderate nutrient levels; and there are also darker colored lakes with circumneutral pH values.
Doctor Phillips Ridge	The ridge, which comprises thick sands, ranges in elevation from 100 to 170 feet and contains many solution depression lakes. Soils on the ridges are primarily sands, but some wetter, lowland type soils are also present. These soils are underlain by clayey sands and fine sands and silt of the Hawthorn Group or other unidentified formations. There are over thirty lakes in this region. Most are clear, with circumneutral pH, and are low in nutrients. As a group, these are some of the clearest lakes in Central Florida. The clearest of the group tend to be also the deepest.
Orlando Ridge	Consisting of an urbanized karst area of low relief with elevations from 75 to 120 feet, the ridge comprises poorly sorted quartz sand and pebbles embedded in kaolinitic clay (Scott <i>et al.</i> , 1980). The natural vegetation consists of longleaf pine and xerophytic oaks. Lakes are generally characterized as clear, alkaline, hardwater lakes of moderate mineral content. They are mesotrophic to eutrophic, but it is difficult to distinguish between natural conditions and the impacts of urbanization. Lakes tend to be more phosphatic and green than those in the Crescent City/DeLand lake region.
Osceola Slope	This lake region is composed of Pleistocene lagoonal deposits with a top layer of medium to fine sands and silts. Elevations are generally 60 to 90 feet. Vegetation is primarily pine flatwoods, but some low, dry ridges contain turkey oak and scrub. Lakes are acidic, relatively low nutrient, and colored.

Appendix C: Management Activities for the Middle St. Johns Basin

This section identifies the principal basin water quality programs and stakeholders by planning unit. It also identifies the current or proposed major water quality projects in each planning unit. Information on the projects came from the Middle St. Johns River Basin Surface Water Improvement and Management Plan (St. Johns River Water Management District, 2002a) unless otherwise referenced.

Stakeholders, Governmental Initiatives, and Current and Proposed Projects, by Planning Unit

Deep Creek Planning Unit

STAKEHOLDERS

Primary stakeholder groups are associated with Volusia County government. The same groups also address natural resource conservation issues in Volusia County portions of the Lake Woodruff, Lake George, and Lake Monroe planning units.

Volusia County Environmental and Natural Resources Advisory Committee was created as an advisory committee to the county council on natural resource protection issues. Membership on the committee includes Volusia County staff and members of the community.

The Volusia Water Alliance is developing a plan to meet Volusia County's long-term water supply needs. Membership on the Alliance includes Volusia County government and cities. The Alliance has ongoing education programs on water conservation.

LOCAL GOVERNMENTAL INITIATIVES

Volusia County approved Volusia Forever, an environmentally sensitive land-purchasing program, in November 2000. Funded by property taxes, the program will acquire lands for water resource protection and recreation, including source water (drinking) protection.

The Volusia County Conservation Corridor, a program developed with cooperation from large landowners, will define a conservation corridor from north to south through the center of Volusia County, most of which is in the Deep Creek watershed. The corridor will enhance wetlands, restore portions of the floodplain, and preserve habitat. Although the program is unfunded, a charter that is being prepared will provide further details on the goals of the corridor.

Volusia County has also initiated a small lot acquisition program to enhance wetlands, restore floodplains, and preserve habitat. The program is long term but has limited funding. Targeted properties include platted floodprone areas.

The Volusia County ECHO (Ecological, Cultural, Heritage, and Outdoors) initiative, approved by voters in November 2000, funds environmental, cultural, historic, and outdoor recreation capital projects. It is a strategy to promote ecotourism in Volusia County. Volusia ECHO is funded by a property tax levy.

Econlockhatchee River Planning Unit

STAKEHOLDERS

The Department developed and moderates the Econlockhatchee Working Group. This working group is composed of local governments, the St. Johns River Water Management District, the Department, environmental advocacy groups such as Audubon and the Sierra Club, and residents and interested parties in the watershed. Attendees have strongly supported the group, which will provide information and gain input during the TMDL process.

The Friends of the Econ is an informal group comprised of local residents with an interest in maintaining the health of the Econlockhatchee River and encouraging land acquisition. This group played a critical role in the designation of the Econlockhatchee as an outstanding Florida water

The Clean Lakes Coalition of Central Florida, which has about 500 members, educates homeowners about lake ecology. It has been effective in convincing Orange County of the importance of formulating stormwater solutions.

The Friends of Maitland's Waterways mission is to inform Maitland/Winter Park citizens of the best management practices (BMPs) that will improve water quality in their lakes. Its goal is to educate citizens by disseminating educational literature.

LOCAL GOVERNMENTAL INITIATIVES

Orange and Seminole counties have each funded a comprehensive master planning initiative in their portions of the Little Econlockhatchee River watershed. Completed in 2001, the two plans, which address water quality improvements and flooding concerns, support one another. An effort was made to ensure consistency between the two counties and eliminate discrepancies in the plans. Because the Little Econlockhatchee watershed is densely developed and largely flat topography, many of the remediation projects will require costly land acquisition so that large regional stormwater facilities can be constructed.

The St. Johns River Water Management District is working with Seminole and Orange counties to cost-share a stormwater quality improvement project in the Crane Strand section of the watershed.

The Florida legislature appropriated \$1 million for the St. Johns River Water Management's Middle Basin Initiative, fiscal year 2001/02. The initiative included a project for the implementation of the Little Econlockhatchee River master plan. Funds will be directed to county projects that will provide water quality improvements.

Orange and Seminole counties have also initiated master planning for the Econlockhatchee River and its watershed. The master plans will address water quality, flooding, and ecosystem concerns and will include recommendations for water resource improvement projects.

PROJECTS

- **Little Econlockhatchee Surface Water Plan:** Seminole and Orange counties have completed a comprehensive water quality and flood remediation plan that includes projects to address chronic water quality and flooding problems in the watershed.

- **East Orlando Regional Retrofit System/Orange County:** The East Orlando/Azalea Park Regional Stormwater Facility, in the southern and upstream portion of the Little

Econlockhatchee River planning unit, requires the construction of a regional stormwater facility to provide water quality treatment, flow attenuation, and flood control for both the East Orlando and Azalea Park canals. The two canals are in close proximity to one another, so that a single water quality improvement and flow attenuation pond could serve both systems. Much of the 1,481-acre watershed was developed prior to current stormwater rules and does not have adequate stormwater controls. The project will include the construction of a pond on approximately eighty-eight acres largely owned by Orange County.

- **Crane Strand System Retrofit and Stormwater Park/Seminole County:** Crane Strand, a tributary to the Little Econlockhatchee River, is the third highest contributor of pollutants to the river. Because most development in the watershed occurred prior to the 1980s, stormwater treatment systems were not required. The project includes a pollution abatement and flow attenuation facility to treat stormwater and reduce flood levels for a developed area of approximately 300 acres. The proposed pond will be in Seminole County, although the system will benefit both Orange and Seminole counties.

Lake George Planning Unit

STAKEHOLDERS

The Lake George Working Group was formed in July 1997 as part of the Department's ecosystem management initiative. Membership included the U.S. Army Corps of Engineers, Florida Fish and Wildlife Conservation Commission, the Department, the St. Johns River Water Management District, and concerned residents and property owners. The group's primary concern was the accumulation of muck in the Drayton Island area of Lake George. The group has not met for about two years.

Stakeholder groups affiliated with the government of Volusia County are described under the Deep Creek Planning Unit.

LOCAL GOVERNMENTAL INITIATIVES

Activities funded by Volusia County are listed under the Deep Creek Planning Unit.

Lake Jesup Planning Unit

STAKEHOLDERS

The Friends of Lake Jesup group was created in the early 1990s to advance the restoration of the lake's water quality, habitat, and navigation values. Because of concerns about the degraded water quality of Lake Jesup, in 1994 the Florida legislature passed the Lake Jesup Act, which directed the St. Johns River Water Management District to begin diagnostic investigations on Lake Jesup and created the Friends of Lake Jesup Restoration and Basin Management Team. As a result, the Friends shifted from a grassroots citizen organization to a legislatively mandated advisory group. Membership comprises representatives from homeowners' associations, environmental groups, local governments, and state agencies. The Friends provided guidance in formulating and evaluating strategies for management, protection, and restoration activities. The group's legislatively mandated advisory role expired in 1998, but members have continued to meet and provide input on the Lake Jesup restoration.

PROJECTS

• **Demonstration and implementation projects:** The Lake Jesup Act provided funding for projects to solve the lake's problems, for example, a phased lake improvement program. Phase 1 of the program consisted of diagnostic studies of the lake and its tributaries. Phase 2 included projects such as lake circulation modeling and the development of a water and nutrient budget. Phase 3 is the implementation of demonstration projects for nutrient load reduction and restoration methods consistent with the Lake Jesup Restoration and Management Plan (Marzolf, 1999). Projects include the following:

- The St. Johns River Water Management District is working to establish nutrient goals or pollution load reduction goals for Lake Jesup by 2005. Improved stormwater quality is expected to reduce nutrient loads. Major mechanisms are stormwater parks, wetland treatment systems, and other appropriate methods.
- To date, the St. Johns River Water Management District has completed a bathymetric study (1996) of Lake Jesup to assess the lake's circulation patterns. The model predicts circulation patterns based on rainfall, tributary flows, wind speed and direction, evaporation, and the topography of the lake bottom. The study results will be useful in understanding the impact of environmental factors, the S.R. 46 causeway, and urban drainage into the lake.
- The St. Johns River Water Management District also has a project under way to collect sediments from the bottom of Lake Jesup. The sediments are mapped and analyzed to determine their impact on water quality.
- Twenty monthly water quality sampling sites in the lake, its tributaries, and floodplain have been in place since 1995. Environmental scientists are conducting analyses to explain the characteristics of degraded quality, such as frequent algal blooms and fish kills in the lake. Orange and Seminole counties have completed water quality and water quantity models for the Howell Creek, Gee Creek, and Soldier Creek watersheds.
- Through ad valorem and local government sources, the St. Johns River Water Management District is coordinating one-foot contour mapping for the Howell Creek watershed.

• **Wetlands restoration:** A project encompassing approximately 1,300 acres is currently under way.

• **Dredging and removal of sedimentation:** A Florida Fish and Wildlife Conservation Commission project is scheduled to begin in fiscal year 2002-03.

• **Nutrient load reductions from Lake Nina:** Lake Nina, a twelve-acre lake with a surface runoff area of approximately seventy-nine acres, is a contributing surface water in the Lake Jesup planning unit. The Lake Nina project will reduce the nutrients discharged into Lake

Jesup. The existing Trophic State Index (TSI) for the lake indicates eutrophic conditions; the future TSI goal for the lake is mesotrophic. A 15 percent reduction in phosphorus loading is required to reach that goal. Most of the watershed contains a four-lane divided roadway that discharges all of its stormwater runoff into the lake, contributing approximately twenty-five pounds of phosphorus per year to the lake. Instead of excavating a single portion of the adjacent park for a wet detention system, the entire park will be regraded to serve as a treatment area during rain events. During dry weather the park will be open to the public. The project was funded as part of the 2001/2002 special legislative appropriation.

- **Lake Waunatta Remediation Project:** Lake Waunatta is one of many Orange County lakes that has experienced extensive urbanization and altered drainage patterns in recent years. These alterations have inevitably increased stormwater flow and degraded water quality in the lake. In the mid-1990s, Lake Waunatta experienced high water levels during an unusual wet weather period. A basinwide stormwater assessment by Orange County in 1996 documented the need for stormwater flood controls and recommended further water quality studies. Pollutants of concern are dissolved nitrogen and phosphorus, which enter the lake from atmospheric deposition, untreated and partially treated stormwater runoff, and baseflow of surficial groundwater that may include contributions from treated septic tank effluent.

A simplified pollutant loading model was developed for Lake Waunatta, based on yearly estimated mass loadings, to predict the pollutant loadings that could enter the lake. In addition, potential loadings from onsite sewage treatment and disposal systems (OSTDSs) were evaluated for the lake's immediate shoreline. Together, the latter two sources could be controlled through engineered solutions. Based on the findings of the loading analysis, about 2,100 pounds of nitrogen and 290 pounds of phosphorus are generated annually from runoff in the watershed. About 60 to 80 percent of this loading reaches Lake Waunatta. Pollutants from OSTDSs in the watershed potentially account for only about 15 pounds of nitrogen and 3 pounds of phosphorus. According to model predictions, a 20 percent reduction in annual loadings may improve trophic status by about 5 percent. Improvements to Lake Waunatta include stormwater storage improvements and long-term water quality improvements. Improved maintenance in the Kmart and Unigold Shopping Plaza ponds would provide an immediate, cost-effective way to reduce runoff volumes. The project was funded by special legislative appropriation for fiscal year 2001/2002.

- **Aquatic plant revegetation:** The St. Johns River Water Management District has initiated an aquatic planting plan to improve fisheries habitat in Lake Jesup. The project will also help to evaluate aquatic vegetation growth patterns in various substrates.

- **Construction of a box culvert along S.R. 46 and Lake Jesup:** In partnership with the Florida Department of Transportation and the city of Sanford, the St. Johns River Water Management District has completed the design of a double concrete box culvert, approximately one mile west of the Geneva Bridge, that would reconnect the lake's floodplain and provide a wildlife crossing. Construction will begin once flowage easements are obtained from private landowners.

- **Removal of levees at the Lake Jesup Conservation Area and the North Lake Jesup Conservation Area:** Removing the levees has reconnected 3,682 acres of wetlands to the lake

and will improve fisheries and wildlife habitat. It has also increased the lake's storage volume, increasing flood protection in surrounding areas. Seminole County has provided additional lake access for public use and established a public park along the southwest shore.

- **Seminole County subdivision stormwater retrofit program.** The county has initiated early planning for the program. Approximately 2,058 subdivisions in Seminole County were platted and constructed prior to 1983, before the development of the St. Johns River Water Management District's stormwater rule. Approximately 1,420 plats are in the unincorporated areas of the county. The retrofit program is needed most in the Lake Jesup watershed but also includes other watersheds in the county.

- **Removal of the S.R. 46 causeway and elevation of a new bridge over Lake Jesup.** The Florida Department of Transportation is in the planning phase of the project, which will allow important internal and external lake recirculation. The U.S. Army Corps of Engineers is determining how best to remove flowage impediments beneath the new bridge.

- **Navy Canal Flood Attenuation and Retrofit Project:** A section of the Navy Canal flows over its banks, causing flooding and increasing the erosion and washouts of downstream structures. The proposed correction involves constructing a 6.4-acre wet detention pond with associated control structures north of Sand Dollar and regrading a segment of the Navy Canal. The pond will also provide water quality treatment for the watershed. The project is projected to reduce pollutant loads by 20,500 pounds per year.

- **Cameron Ditch Project:** The proposed project for Cameron Ditch includes the construction of a four-acre wet detention facility to provide water quality treatment for a tributary drainage area of approximately 416 acres. The Watershed Management Model (WMM) predicts that the facility will remove approximately 45,000 pounds of phosphorus per year.

Lake Monroe Planning Unit

STAKEHOLDERS

Stakeholder groups affiliated with Volusia County government are described under the Deep Creek Planning Unit.

LOCAL GOVERNMENTAL INITIATIVES

The St. Johns River Water Management District is developing minimum flows and levels for the Middle St. Johns River near S.R. 44 in Volusia County. Rule making on the proposed flow levels is not anticipated till April 2003.

Seminole County has completed master plans for several watersheds in the planning unit, including the Midway, Sanford, and Lake Monroe watersheds. The plans identify deficiencies and include recommendations for remediation projects. A 2001 legislative appropriation of \$1 million provided funding for the Lake Monroe and Midway watersheds.

The city of Deltona is developing a Watershed Management Plan to address water quality and flood protection needs.

Due to increased development and increased concerns about flood damage, the St. Johns River Water Management District asked the National Weather Service's Southeast River Forecast Center to develop and implement a flood forecast system for the southern portion of the Middle St. Johns Basin. The model is being verified and is scheduled for implementation within one year. It will focus on the Lake Monroe watershed.

Activities directed by Volusia County are listed under the Deep Creek Planning Unit.

PROJECTS

- **Lake Monroe Basin Watershed Plan Implementation/Seminole County:** Water quality and flooding problems are common in the planning unit. Many areas were developed prior to stormwater regulations, resulting in the direct discharge of untreated stormwater to Lake Monroe and the St. Johns River. In several areas of the Midway watershed, retrofits are needed to improve surface water quality and quantity. Master planning efforts by Seminole County have identified locations for remediation projects.

- **Remediation projects to solve flood problems and improve water quality:** A number of projects have been identified and will be implemented through funding from special legislative appropriations. The remediation projects, which include measures to improve stormwater water quality discharged to receiving bodies, are as follows:

- ***Cameron Avenue Drainage Improvements and Water Quality Retrofit Project:*** Water from the drainage area receives no treatment and discharges via a thirty-six-inch pipe directly into the St. Johns River. The project involves the installation of a water quality baffle box to remove sediments and pollutants and improvements to the secondary drainage system, consisting of the installation of one curb inlet, curb repairs, and regrading and sodding of an existing swale/ditch.
- ***Brisson Avenue Drainage Improvements and Water Quality Retrofit Project:*** The drainage area includes Brisson Avenue at the railroad crossing and south of Celery Avenue. Drainage is provided by ditches and cross-drains that eventually discharge into Lake Monroe, with no water quality treatment. Roads in the area frequently flood. The retrofit involves the design and construction of a retention pond to improve water quality, the replacement and upsizing of several culverts and cross-drains, and regrading and sodding of some of the ditches.
- ***First Drive Drainage Improvements and Water Quality Retrofit:*** Drainage for the First Drive area consists of ditches and cross-drains that eventually discharge into the St. Johns River, with no water quality treatment. Roads in the area frequently flood. The project involves the design and construction of a retention pond/sedimentation basin, the upsizing of several cross-drains, and regrading and sodding some of the ditches.
- ***Celery Avenue Regional Flood Attenuation and Water Quality Treatment Facility:*** The Celery Avenue drainage area, which currently receives no water quality treatment and experiences erosion and flooding problems, discharges into Lake Monroe and the St. Johns River. The construction of a twenty-acre regional

stormwater retention pond will improve water quality and provide flood protection for homes and for Celery Avenue, which floods during minor storms. A created wetland will further improve water quality and enhance wildlife habitat. The project will also delineate and remediate contaminated soils on the site.

Lake Woodruff Planning Unit

STAKEHOLDERS

Stakeholder groups affiliated with Volusia County government are listed and described under the Deep Creek Planning Unit.

LOCAL GOVERNMENTAL INITIATIVES

Activities initiated by Volusia County are described under the Deep Creek Planning Unit.

Wekiva River Planning Unit

STAKEHOLDERS

The Wekiva River Basin Working Group was initiated by the Department and has been meeting since 1994. Membership in the group is comprised of the Department, St. Johns River Water Management District, Lake County, Seminole County, Orange County, Altamonte Springs, Division of Forestry, Fish and Wildlife Conservation Commission, and the U. S. Army's Corps of Engineers. A major accomplishment of the group was the development of a master mitigation list for use by permitting agencies and local governments.

The Friends of the Wekiva River, a nonprofit organization, works to preserve the beauty and natural function of the Wekiva River ecosystem. Its major goals are to promote and protect the aesthetic and recreational values of the watershed, promote restoration of the river and its tributaries, and present educational programs to achieve these goals. The Friends identify potential impacts to the river and work to minimize or eliminate them.

The Little Wekiva River Technical Subcommittee, formed in 1995 by the St. Johns River Water Management District, has a legislative mandate to direct state funding for projects in the Little Wekiva watershed. The group has secured funding for riverbank stabilization projects, sediment removal, and stormwater retrofits. Membership includes the Department, the St. Johns River Water Management District, Orange and Seminole counties, the cities of Altamonte Springs and Orlando, the Friends of the Wekiva, and property and business owners. New efforts are under way to develop a basinwide master plan to address water quality and stream flow attenuation projects in the watershed. Sedimentation in the downstream sections of the Little Wekiva has also added to nuisance vegetation problems in both the Little Wekiva and the Wekiva rivers. Canoe usage is being documented to encourage state and federal agencies to maintain the stream, and to identify parcels of land needed to provide public access for recreation.

Sweetwater Cove is a tributary to the Wekiva River that historically received wastewater. Excess sediment, nuisance vegetation, and poor esthetics are concerns. The Sweetwater Cove Tributary Surface Water Restoration Project was initiated in 2000 with legislative funding. The Sweetwater Cove Tributary Surface Water Restoration Project Advisory Group was formed by the St. Johns River Water Management District to allow stakeholders the opportunity to

participate in the restoration process. The group comprises representation from local residents, the Department, Friends of the Wekiva, Utilities, Inc., St. Johns River Water Management District, and Seminole County.

PROJECTS

- **Water quality planning, management, and improvement projects:** Projects in the Little Wekiva watershed include intensive work to address erosion and sedimentation issues. Since 1995, the Little Wekiva River Technical Working Group and the St. Johns River Water Management District have developed a master plan for erosion control and received \$11.95 million from the state during 1995, 1996, 1998, 2000, and 2001 to implement the plan. An additional \$350,000 was made available through the Florida Department of Transportation Mitigation Bill process. All of these funds were matched with local and regional funds to complete the work. Eleven projects have been constructed, including four high-priority projects, to address bed and bank stabilization and sediment removal. An additional four projects are in the design phase, with construction anticipated in the next calendar year. Part of the Little Wekiva River's stream channel was diverted to a pipe in the 1970s. A portion of the pipe has collapsed, causing extensive damage to several homes. One of the largest projects currently under design is the removal of 1,700 linear feet of that pipe. During the 2000 legislative session, \$5 million was appropriated for restoring this section of the river.
- **Development of master plans:** Orange and Seminole counties have initiated the development of master plans for their portions of the Wekiva River watershed. Orange County has completed master plans for the Coroni, McCoy, and Prevatt watersheds. The plans include stormwater retrofit projects.
- **Land acquisition:** As a result of the 1990 Central Florida Beltway Mitigation Act, the St. Johns River Water Management District has received funds to purchase environmentally sensitive lands or restoration lands in the Wekiva River watershed. The district has completed several ecosystem/water quality improvement projects in the watershed through the Florida Department of Transportation's Central Florida Beltway Mitigation Bill. Restoration of the STS site on the Wekiva River, an erosion control project in Wekiva Springs State Park, the Tram Road removal in the Wekiva Basin GEOPark, and some additional land acquisition will also be possible with funds provided through the Beltway Bill.
- **Votaw Road Pond Water Quality Improvement:** Identified by Orange County in the master plan for the Coroni, McCoy, and Prevatt watersheds, the project received special legislative appropriations for fiscal year 2000/2001. It includes the retrofit of a stormwater treatment system known as the Votaw Road Pond. The system drains into the Wekiva Basin GEOPark. An additional stormwater retrofit is planned for the Lake McCoy watershed utilizing unspent funds from the Votaw Road project. Construction on the Tanglewilde Street/Ustler Road retrofit is scheduled for late 2002 or early 2003.
- **Sweetwater Oaks/Cove Lake tributary to the Wekiva River:** In 2001, the Florida legislature provided \$500,000 in funding for restoration work in this tributary watershed.

Historically, the watershed was a discharge point for treated wastewater. The work will include water quality improvements, native vegetation restoration, and possibly some dredging.

- **Little Wekiva River Watershed Management Plan Implementation:** Erosion has caused water quality and environmental degradation in the downstream sections of the Little Wekiva River and the Wekiva River system. The design and construction of surface water restoration projects listed in the Little Wekiva River Watershed Management Plan will address the erosion and sediment transport problems in the main channel of the Little Wekiva River. The projects include structural bed and bank protection, biotechnical bank protection, grade control structures, the widening and re-sloping of river sections, and the installation of sedimentation basins. Several dredging and grading projects are in the design phase and include Edgewater Drive, Gusty Lane, Sherry Drive, and Elba Way. Several projects have been successfully constructed and the remainder of the plan is being implemented, including the following projects:
 - ***Northwestern Avenue Area/Seminole County:*** Erosion in the Northwestern Avenue portion of the river is very high, and sediment transport to the downstream system is excessive. The Northwestern bridge is at risk, and its collapse would cause serious downstream impacts in addition to the impacts at the site. The project will stabilize the riverbed and banks, restore the grade to a manageable level, and reduce the transport of sediment downstream. The project will include gabion side banks, renomattress channel lining, and if necessary a grade control structure.
 - ***S.R. 434 Sedimentation Basin/Seminole County:*** Near S.R. 434, the river profile changes from a very steep gradient, becoming much flatter. As a result, the excess sediments are deposited just downstream of S.R. 434 and the river channel becomes filled in. This location is the farthest downstream point where sediment can be removed more pristine river section. The construction of a sedimentation basin will allow routine maintenance to remove collected sediment without destruction of the stream channel that would result from the direct removal of sediments. The Sedimentation Basin will be constructed such that the flow will be off-line from the river and will be closed from flow during maintenance. The off-line system will also provide additional treatment.
 - ***Riverbend Apartments/City of Altamonte Springs:*** The Riverbend project includes a site where severe erosion has caused water quality degradation and adverse environmental impacts. The area was identified for an erosion control and bank stabilization project in the Little Wekiva River Watershed Management Plan. The project will realign the river to re-create its historical route and will include bank stabilization and bed protection for the highly eroded parts. Funding is also available for this project from a previous year.

Appendix D: Assessment Methodology and Bioassessment Summary With Supporting Data for the Middle St. Johns Basin

The Department relies on environmental data collected by a variety of organizations to carry out its mission to protect human health and the environment. Effective project planning, sampling design, and raw data review are essential to ensure that the data collected and analyzed are relevant to the decisions being made. This appendix describes the methodology used to prepare the Basin Status Report.

Federal and State Requirements

The primary starting point for the Basin Status Report was the 305(b) assessment report. Section 305(b) of the Clean Water Act requires states to report biennially to the U.S. Environmental Protection Agency on their water quality. The 305(b) report provides information on the physical, chemical, biological, and cultural features of each river basin in the state. This initial assessment provides a common factual basis for identifying information sources and major issues, and determining future changes, strategies, and actions necessary to preserve, protect, and/or restore water quality in individual basins. Understanding the physical framework of each basin allows the development of a methodology 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 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 prioritized schedule. In 1999, the Florida legislature enacted the Florida Watershed Restoration Act, which clarifies the Department's statutory authority to establish TMDLs, and establishes a process for identifying and listing impaired waters and for developing TMDLs and the associated watershed management plans needed to allocate and achieve the needed pollutant load reductions.

Section 303(d) of the Clean Water Act and Section 403.067, Florida Statutes, describe impaired waters as those waterbodies or waterbody segments that do not meet applicable water quality standards. This is a broad term that includes designated uses, water quality criteria, the Florida antidegradation policy, and moderating provisions. Using procedures defined in the impaired surface waters rule (Identification of Impaired Surface Waters Rule, Chapter 62-303, Florida Administrative Code), existing water quality data were evaluated to determine whether waters on the 1998 303(d) list in each basin were, in fact, impaired.

Impaired Surface Waters Rule

The impaired surface waters rule establishes the methodology to identify surface waters of the state that will be included on the state's planning list of waters to be assessed under Sections 403.067(2) and (3), Florida Statutes. The methodology for developing the planning list includes an evaluation of aquatic life use support, primary contact and recreational use support, fish shellfish consumption use support, drinking water use support, and protection of human health. The rule also establishes a methodology to identify impaired waters that will be included on the state's verified list of impaired waters, for which the Department will calculate TMDLs under Section 403.067(4), Florida Statutes.

The Basin Status Reports follow the methodology in Section 62-303.300, Florida Administrative Code, to develop a planning list under Section 403.067(2), Florida Statutes. As required by Section 403.067(2), Florida Statutes, the planning list will not be used to administer or implement any regulatory program. It will be submitted to the U.S. Environmental Protection Agency for informational purposes only. Waters on the planning list have been assessed under Section 403.067(3), Florida Statutes, as part of the Department's watershed management approach. During this assessment, the Department will determine if the waterbody is impaired and if the impairment is caused by pollutant discharges using the methodology in Part III, Section 62-303.400, Florida Administrative Code, for the verified list under the impaired surface waters rule. The verified list will be adopted by Secretarial Order and forwarded to the U.S. Environmental Protection Agency for approval as Florida's Section 303(d) list of impaired waters, or TMDL list.

Assessment Methodology

STORET

STORET is the U.S. Environmental Protection Agency's Oracle-based **ST**orage and **RE**trieval database. For over thirty years, scientists have stored the nation's biological, chemical, and physical data on ground water and surface water quality in STORET. In Florida, federal, state, local, and interstate agencies; universities, contractors; laboratories; and volunteer organizations such as LakeWatch and the Bream Fisherman's Association submit data to STORET.

In early 1992, the agency modernized STORET to take advantage of new technological and information management developments. As a result, STORET now consists of two interrelated databases. The Legacy Data Center stores historical water quality data from the 1960s until the end of 1998. Although data retrievals can still be made, data can no longer be uploaded to the Legacy database. The modernized STORET database contains data collected from 1999 onwards, as well as older data from agencies that did not previously upload data to the Legacy database.

Chemistry

The chemistry data used in the basin assessments are taken from the U.S. Environmental Protection Agency's STORET database. The stations used for the chemical assessment were determined to be ambient surface water stations, and information from point sources or wells was specifically excluded. Stations were classified as one of five waterbody types—spring, stream, lake, estuary, or blackwater—based on criteria described in the 305(b) report. The chemistry data for the planning list covers the period from 1991 to 2000. It includes metals (e.g., arsenic, lead, and cadmium), nutrients (e.g., chlorophyll *a*, total nitrogen, and total phosphorus), or conventional parameters (e.g., oil and grease, fecal coliforms, and pH). The chemistry data for the verified list cover the period from 1996 to 2000 and include the same parameters. The planning and verified lists will be amended to include any additional chemistry or biology data that are gathered or reported chemistry data from 2000 to the present, once those data are verified through the protocol in the impaired surface waters rule.

To determine if a water segment should be placed on the planning list for each parameter, the chemistry data were analyzed using a SAS computer program written with criteria established in the impaired surface waters rule, with two exceptions. First, the unionized ammonia data were not analyzed by the program, but rather by using an Excel spreadsheet. Second, because the full complexity of the pH criterion could not be programmed, listings for pH were not included. pH will be further examined while additional data are collected during Phase 2 of the watershed management cycle. Data analysis and statistical summaries of segments with waterbody identification numbers (WBIDs), waterbody types, and parameters obtained through STORET data were conducted using Access, SAS statistical software, Excel applications, SYSTAT statistical software, and ArcView GIS applications.

Metals and Conventional Parameters

The data for metals and conventional parameters were compared with the state's numerical criteria in Section 62-302.530, Florida Administrative Code. A water 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. A table of sample sizes versus exceedances may be found in Section 62-303.320, Florida Administrative Code, Table 1. The terms "exceed" and "exceedances" refer to cases where water quality criteria or standards were not met. An exceedance for dissolved oxygen, however, means that a waterbody does not meet the dissolved oxygen criterion, rather than an actual exceedance of the criterion.

Nutrients

Potential nutrient impairment was evaluated by calculating the Trophic State Index (TSI) for lakes and calculating annual mean chlorophyll *a* values for estuaries and streams. For lakes, the TSI was calculated based on procedures outlined in the 1996 305(b) report. Lakes with a mean color greater than 40 platinum cobalt units (PCUs) were considered nutrient enriched if the annual mean TSI exceeded 60. Lakes with a mean color less than or equal to 40 PCUs were considered nutrient enriched if the annual mean TSI exceeded 40. In addition, lakes were considered nutrient enriched if there was an increase in the TSI over the 1991 to 2000 period or if TSI measurements were 10 units higher than historical values. In estuarine areas, if the annual mean chlorophyll *a* values were greater than 11 micrograms per liter ($\mu\text{g/L}$) or if annual mean chlorophyll *a* values increased by more than 50 percent over historical values for at least two consecutive years, the water was considered nutrient enriched. For streams, if the annual mean chlorophyll *a* values were greater than 20 $\mu\text{g/l}$ or if the annual means increased by more than 50 percent over historical values for at least two consecutive years, the water was considered nutrient enriched.

Fish Consumption Advisories

Segments were placed on the planning list based on fish consumption advisories issued by the Florida Department of Health, urging limited consumption or no consumption of certain fish species in specific Florida waters because of high levels of mercury or other contaminants in fish tissues.

Biology

Bioassessments were provided for streams, lakes, canals, and rivers using the impaired surface waters rule as guidance. The Department's standard operating procedures, which provide definitions and specific methods for the generation and analysis of bioassessment data, are referenced in the individual bioassessment data tables, **Tables D-2 through D-7**. 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 Basin Status Reports, 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, unicellular plankton), and macroinvertebrates (e.g., insects, crayfish, snails, and mussels).

A number of bioassessment metrics and indices exist for assessing populations of plant and animal life, including fish, diatoms, and macroinvertebrates. The bioassessments in this appendix include only macroinvertebrate data from ambient sites in state surface waters. The data included sites designated as test and background sites for National Pollutant Discharge Elimination System (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 buffer zone widths) was not available at the time of reporting, it was not included. However, habitat and physicochemical assessment information is instrumental in pinpointing the causes for failed bioassessment metrics and will be included in future reporting.

Bioassessments are provided for streams, canals, and rivers with data generated according to the Department's standard operating procedures FS-7420 and FS-7430 and analyzed according to the Stream Condition Index (SCI) for Florida (Barbour *et al.*, 1996) (FDEP SOP #LT-7200) and/or Section 62-302.530(11), Florida Administrative Code (Biological Integrity Standard). Bioassessments are also provided for clear lakes (≤ 20 platinum cobalt units [PCUs]) with data generated according to the Department's standard operating procedure FS-7460 and analyzed according to the Lake Condition Index (LCI) for Florida (Gerritsen *et al.*, 2000) (FDEP SOP # LT-7300). Since macroinvertebrate-based indices have not been shown to assess colored lakes in Florida accurately (> 20 PCUs), they have been excluded from the bioassessments in this appendix.

The data used in this Basin Status Report were obtained from the Department's Biological Database (SBIO) and the U.S. Environmental Protection Agency's STORET Water Quality

Database, where it could be substantiated that the data were generated in compliance with the bioassessment standard operating procedures in Section 62-303.330, Florida Administrative Code.

The data from these databases were used without regard to the randomness of sample site selection. The general period of record for data used in analysis as January 1, 1992 through December 31, 2001. The period of record used for evaluation of lake data was June 21, 1995, through December 31, 2001. The June 21st date corresponds to the inception of the current Department standard operating procedures for sampling lakes (FS-7640). For the purposes of this report, 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.

METRIC DEFINITIONS

of Taxa—This metric is otherwise known as taxa richness. In this report, it indicates the total number of macroinvertebrate taxa found in a sample of stream or lake bottom, other in-water substrates such as fallen branches or roots, or artificial surfaces placed in the waterbody for invertebrate colonization. A taxon (singular) is a group of organisms with common traits and characteristics, such as dragonflies (taxon Odonata). As the environment is stressed, the number of taxa present generally decreases.

of Chironomid Taxa—Chironomids are larval flies that are prevalent in many surface waters. This metric is also a measure of taxa richness.

of EPT or EOT Taxa—Particular organisms or groups of organisms in a given surface water habitat are more sensitive to changes in the environment than others, making them good indicators of environmental stress. Mayflies (Ephemeroptera), stoneflies (Plecoptera), caddisflies (Trichoptera), and dragonflies and damselflies (Odonata) are four such taxa.

% Diptera—Dipterans are larval flies, many of which are tolerant of poor water quality conditions. This metric represents the fraction of the total number of dipteran organisms in a sample. A large fraction indicates an invertebrate community that is predominantly tolerant of low water quality.

Florida Index—The Florida Index is a weighted measurement of the numbers of Class I and Class II macroinvertebrate species known in Florida. It assigns points to stream-dwelling macroinvertebrates based on their sensitivities to pollution. It is an index in itself, but the results can be incorporated into other indices as measurements of biological integrity.

% Filter Feeders—Filter-feeding organisms indicate the flow regime in a waterbody. The larger the fraction of the total community consisting of filter feeders, the more likely it is that the waterbody has a good flow regime.

% Dominant Taxon—In all waterbodies, the taxon that exists in greater number than all others is known as the dominant taxon. A high percentage of the dominant taxon in a sample indicates lower diversity and poorer water quality.

Shannon-Wiener Diversity Index—This is a measurement of macroinvertebrate community health, specified in Section 62-302, Florida Administrative Code. It incorporates levels of taxa richness (how many taxa are present) with the distribution of individuals among taxa present (how evenly they are distributed). Like the Florida Index, it is an index in itself. However, the result is often included in other indices of biological integrity. Low diversity scores indicate conditions where only a few species are present to the exclusion of other taxa.

Hulbert Index—This index is also a weighted measurement of the numbers of Class A and Class B species of macroinvertebrates known in Florida lakes. It is also an index in itself, but the result is included in the calculation of the Lake Condition Index as a separate metric value.

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 Index score; Hulbert Index score; and percent Dipteran individuals. LCI calculations are only provided for clear lakes (≤ 20 platinum cobalt units [PCUs]). Since 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 Stream Condition Index (SCI) score was calculated by adding the scores of the seven metrics in the method, i.e., 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 under the impaired surface waters rule.

Table D-1: Lake Condition Index (LCI) Scoring and Evaluation Worksheet for Clear Florida Lakes (<20 platinum cobalt units)

Macroinvertebrate 12-benthic grab composite	A 95th Percentile of Reference Pop	B Observed Values	100(B/A) Metric Score
Total Number of Taxa	30.5		
Total Number of EOT Taxa	5.2		
%EOT Taxa	34.4		
Shannon-Wiener Index	4.39		
	A 95th Percentile of Ref. Pop	B Observed Values	100(100-B)/(100-A) Metric Score
%Dipteran Individuals	13.6		
Total of Metric Scores			
LCI Score (average metric score)			
Acid (pH<6.5)		Alkaline (pH>6.5)	Evaluation
Ecoregion 65	Ecoregion 75		
>55	>44	>50	Very Good
>35	>30	>35	Good
>18	>15	>18	Poor
>18	>15	>18	Very Poor

Table D-2: Stream Condition Index (SCI) Scoring and Evaluation Worksheet

Summer Index Period (May - October):														
Macroinvertebrate Dipnet (20 sweeps of most productive substrates)	Value	Panhandle				Peninsula				Northeast				
		5	3	1	Score	5	3	1	Score	5	3	1	Score	
Total Number of Taxa EPT Taxa #Chironomid Taxa % contribution of dom. Taxa %Diptera Florida Index %Suspension Feeders/Filterers		=31	30-16	<16		=26	25-14	<14		=22	21-12	<12		
		=7	6-4	<4		=4	3-2	<2			=2	<2		
		=9	8-5	<5		=7	6-4	<4		=7	6-4	<4		
		=22	23-61	>61		=29	30-64	>64		=31	32-66	>66		
			=50	>50			=37	>37			=47	>47		
		=16	15-8	<8		=7	6-4	<4		=8	7-5	<5		
		=12	11-6	<6			=7	<7			=7	<7		
Total Score		Panhandle				Peninsula				Northeast				
Evaluation		Excellent			27-33	Excellent			26-31	Excellent			25-29	
		Good			21-26	Good			20-25	Good			19-24	
		Poor			14-20	Poor			13-19	Poor			13-18	
		Very Poor			7-13	Very Poor			7-12	Very Poor			7-12	

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 one or two metrics failed to meet the thresholds established for them, the water was deemed suspect. Suspect waters were not considered impaired based on the impaired surface waters rule. If all three metrics failed to meet thresholds, however, the water was deemed impaired, based on the method and 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-Weaver Diversity Index scores for paired background and test sites, as specified in the Biological Integrity Standard of Rule 62-302.530(11), Florida Administrative Code. One failure of the standard meant that a waterbody or waterbody segment was listed as potentially impaired.

Bioassessment Summary for the Middle St. Johns Basin

This section summarizes bioassessment results and provides supporting data tables for the Middle St. Johns Basin. **Tables D-3 through D-6** contain the results of Stream Condition Index (SCI) and Lake Condition Index (LCI) assessments performed in the basin, Rapid Bioassessment (BioRecon) results, and selected results from artificial substrate analyses (Hester-Dendy analyses). **Table D-7** summarizes the results of each bioassessment test with determinations of compliance with applicable state water quality rules. All tests employed and data analyzed are based on measurements of surface water macroinvertebrate community integrity. The Department generated all data used according to its standard operating procedures.

To evaluate the overall biological integrity of the Middle St. Johns Basin, bioassessment data consisting of a total of 114 SCI samples, 36 BioRecons, six paired (control vs. test site) Hester-Dendy biointegrity samples, and 10 LCI samples were examined. Based on these samples, twelve waterbodies were placed on the planning list, and four were placed on the verified list. Further bioassessments should be performed where clear trends or influences have not been indicated.

Waterbodies are listed by waterbody identification number (WBID). The following WBIDs meet the criteria for the planning list based on SCI sampling: WBID 2893Z (St. Johns @ Hwy. 40), WBID 2962 (Smith Canal), WBID 2987B (Little Wekiva), WBID 2990 (Salt Creek), WBID 2992 (Black Sweetwater), WBID 2996 (Sweetwater Creek), WBID 3022 (Bithlo Branch), and WBID 3037 (Unnamed wetlands, test for OCPUD STP FYI). WBID 3003A (Mills Branch) meets the criteria for the planning list based on BioRecon sampling. WBID 2893B (Blue Springs Run), WBID 2893C (St. Johns @ Hwy 17-19), WBID 3014 (Crane Strand Canal), and WBID 3033 (Unnamed wetland, control for OCPUD STP FYI) meet the criteria for the verified list based on SCI sampling. WBID 2893B (Blue Spring Run) has limited habitat due mainly to algal growth.

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Table D-3: Analysis of Macroinvertebrate Data from Samples Taken in the Middle St. Johns Basin by the 20-Dipnet Sweep Sample Collection Method (FDEP SOP # FS-7420 and # L.T-7200)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid Taxa		FL Index Score ^b	%Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Juniper Creek at Highway 19	2905	20010454	09/29/92	31	7	7	13.47	15	5.73	21.59	Grandidierella bonnieroides	29	Excellent
Juniper Creek at Highway 19	2905	20010454	08/23/94	36	7	9	20.74	27	3	24.42	Tricorythodes albiineatus	29	Excellent
Juniper Creek at Highway 19	2905	20010454	08/03/93	19	5	2	5.22	8	0.87	48.7	Grandidierella bonnieroides	21	Good
Juniper Creek at Highway 19	2905	20010454	03/30/93	37	7	15	17.77	19	4.57	24.87	Grandidierella bonnieroides	29	Excellent
Juniper Creek at Highway 19	2905	20010454	02/01/94	30	6	8	22.7	21	5.68	19.46	Hyalella azteca	27	Excellent
Juniper Creek at Highway 19	2905	20010454	01/31/95	37	5	12	29.09	22	5	14.55	Limnodrilus hoffmeisteri	29	Excellent
Juniper Creek at Highway 19	2905	20010454	08/29/95	33	8	4	4.25	20	29.95	25.47	Corophium	29	Excellent
Juniper Creek at Highway 19	2905	20010454	03/04/96	39	9	8	20.55	16	13.01	12.33	Hydroptila	29	Excellent
Juniper Creek at Highway 19	2905	20010454	07/19/99	35	10	9	23.16	17	6.21	12.43	Baetis	29	Excellent
Deep Creek @ Hwy 17 Bridge	2908	20010524	09/23/97	35	3	20	56	13	18.8	24	Tanytarsus sp. fepler	29	Excellent
Ashby Creek at County Park	2936	20010197	02/10/97	29	3	15	75.79	18	12.63	20	Ablabesmyia mallochi	27	Excellent
Big Wekiva Riv at Wekiva Marina	2956	20010377	02/11/92	38	5	13	20.41	22	3.29	42.1	Gammarus	27	Excellent
Big Wekiva River upstream of Little Wekiva	2956	20010103	01/15/97	44	7	17	24.7	19	6.33	13.86	Baetis pygmaeus	29	Excellent
Big Wekiva Riv at Wekiva Marina	2956	20010377	01/12/99	29	3	5	7.64	12	9.72	24.31	Notogillia wetherbyi	27	Excellent
Wekiva R. upstrm of Rock Springs	2956	20010431	01/12/99	44	10	16	44.04	20	13.76	11.93	Cricotopus bicinctus	31	Excellent

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	% Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Big Wekiva River upstream of Little Wekiva	2956	20010103	01/13/99	49	12	19	49.35	19	17.21	9.09	Tanytarsus sp. c epler	33	Excellent
Wakiwa (Wekiva) R. ab. Rock Spgs run	2956	SPRINGS 006	10/16/00	22	5	5	10	8	1.33	42.67	Hyalella azteca	21	Good
Wakiwa (Wekiva) R. ab. Rock Spgs run	2956	SPRINGS 006	03/21/01	36	6	15	50	20	22.84	16.67	Rheotanytarsus exiguus grp.	33	Excellent
Wakiwa (Wekiva) R. ab. Rock Spgs run	2956	SPRINGS 006	10/16/01	34	3	10	53.54	12	20.08	33.07	Tanytarsus sp. e epler	25	Good
Yankee outlet @ jeep trail	2961	20010344	01/14/99	19	3	4	2.99	13	23.88	30.85	Gammarus	23	Good
Smith Canal, ref for Lincoln Heights STP FYI	2962	20010630	05/04/93	16	0	9	64.24	2	0.99	21.85	Goeldichironomus holoprasinatus	17	Poor
Smith Canal, test for Lincoln Heights STP FYI	2962	20010632	05/04/93	13	0	7	20.88	3	3.3	70.33	Limnodrilus hoffmeisteri	13	Poor
Smith Canal, ref for Lincoln Heights STP FYI	2962	20010630	08/18/97	24	1	6	45.92	2	0	15.31	Polypedilum halterale grp.	17	Poor
Smith Canal, test for Lincoln Heights STP FYI	2962	20010632	08/18/97	30	1	7	37.67	5	13.13	29.18	Hyalella azteca	23	Good
Rock spring run 50m upstrm wekiva river	2967	20010342	01/12/99	39	11	8	30.63	17	16.25	12.5	Cladotanytarsus	31	Excellent
ditch at Airport near Lake Jessup	2982	20010187	08/25/97	22	4	6	15.46	5	2.58	38.14	Microcyllopus pusillus	21	Good
Elder Spring Run @ Myrtle Ave.	2984	20010294	08/25/97	24	3	5	11.11	9	14.44	28.89	Microcyllopus pusillus	23	Good
Soldier Cr. SR #419 Midstream	2986	20010184	07/09/96	24	3	4	18.49	7	27.73	21.01	Microcyllopus pusillus	23	Good
Lit Wekiva River at SR 434	2987	20010137	01/15/97	33	3	17	62.5	11	16.88	21.25	Polypedilum convictum grp.	29	Excellent

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	%Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Little Wekiva River at Betsy Ln off Delk Rd	2987	20010102	01/15/97	61	14	25	45.54	34	15.38	15.08	Polypedilum convictum grp.	33	Excellent
Little Wekiva 50m up from big wekiva	2987	20010343	01/13/99	61	12	27	54.07	24	17.41	7.78	Cricotopus bicornis	31	Excellent
Salt Creek @ Packard Ave.	2990	20010051	08/12/97	19	2	3	4.59	5	3.67	42.2	Pyrgophorus platyrachis	17	Poor
Big Econlock-hatchee R SR #420	2991	20010129	09/08/92	38	10	10	48.99	24	27.26	16.6	Simulium	29	Excellent
Big Econlock-hatchee R SR #420	2991	20010129	02/18/92	44	7	13	50.22	25	13.68	15.83	Polypedilum convictum	31	Excellent
Big Econlock-hatchee R SR #420	2991	20010129	08/16/94	24	3	6	24.21	11	4.21	17.89	Hydroporus	23	Good
Big Econlock-hatchee R SR #420	2991	20010129	09/21/93	33	6	12	64	23	7.5	15	Tribelos fuscicornis	29	Excellent
Big Econlock-hatchee R SR #420	2991	20010129	03/09/93	34	8	8	38.97	22	45.59	19.85	Cheumatopsyche	31	Excellent
Big Econlock-hatchee R SR #420	2991	20010129	03/22/94	49	8	17	58.43	25	26.12	16.29	Polypedilum convictum grp.	31	Excellent
Big Econlock-hatchee R SR #420	2991	20010129	02/14/95	39	7	9	32.47	20	28.25	15.58	Polypedilum convictum grp.	33	Excellent
Big Econlock-hatchee R SR #420	2991	20010129	02/26/96	25	5	7	63.71	14	6.85	46.77	Polypedilum illinoense grp.	21	Good
Big Econlock-hatchee R SR #420	2991	20010129	09/02/97	38	5	19	56.13	12	16.13	8.39	Dubiraphia	31	Excellent

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	%Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Black Sweetwater @ Howard Ave.	2992	20010354	09/24/97	19	1	5	6.19	6	0	73.45	Pyrgophorus platyrachis	15	Poor
Shortcut canal 100 yds. downstrm of Howard Av	2995	20010127	09/08/97	21	4	6	9.58	11	17.37	33.53	Gammarus	27	Excellent
Sweetwater Creek, 0.15 MI S of Howard Ave.	2996	20010090	08/12/97	15	0	7	27.97	8	2.54	51.69	Pyrgophorus platyrachis	17	Poor
Howell Cr SR #434 Midstream	2997	20010186	07/09/96	19	2	4	10.42	10	48.44	36.46	Pisidiidae	23	Good
Howell Creek @ Winter Springs Blvd.	2997	20010042	08/18/97	20	6	4	19.64	11	11.61	23.21	Microcylopus pusillus	25	Good
Bear Creek @ Northern way bridge	2999	20010049	09/24/97	27	5	5	10.92	11	7.56	29.41	Microcylopus pusillus	29	Excellent
Little Econ R, 100 ft below Iron Bridge outfall	3001	20011008	09/15/92	17	1	6	15.38	7	9.62	17.31	Pyrgophorus platyrachis/Dubiraphia vittata	23	Good
Little Econ R, 100 ft above Iron Bridge outfall	3001	20011041	09/15/92	16	2	1	11.11	4	5.56	31.48	Pyrgophorus platyrachis	17	Poor
Little Econ R, 100 ft above Iron Bridge outfall	3001	20011041	02/26/96	54	5	20	42.8	13	23.3	12.5	Pisidiidae	33	Excellent
Little Econ R, 100 ft below Iron Bridge outfall	3001	20011008	02/26/96	23	2	9	68.07	7	13.03	47.9	Polypedilum illinoense grp.	21	Good
Little Econ R at Valencia Community College	3001	20010016	02/26/96	28	3	11	51.7	21	20.07	19.05	Polypedilum convictum grp.	31	Excellent
Little Econ R at Curry Ford Rd	3001	20010040	02/26/96	26	4	12	52.08	11	35.94	20.83	Polypedilum convictum grp.	31	Excellent

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	%Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Little Eoon R at Berry Dease Rd	3001	20010025	02/26/96	40	8	12	33.44	18	6.44	37.73	Microcylo-epus	27	Excellent
Little Eoon River at Buck Rd	3001	20010015	02/26/96	30	5	11	36.54	12	4.33	23.08	Polypedium convictum grp.	29	Excellent
Mills Creek @ Brumley Rd Bridge	3003	20010327	02/10/97	37	6	18	60	18	20.91	17.27	Ancylidae	31	Excellent
Mills Creek @ Brumley Rd Bridge	3003	20010327	09/02/97	36	5	13	60.96	16	32.46	32.89	Polypedium convictum grp.	29	Excellent
Little Wekiva River at Princeton & Silver Star	3004	20010100	01/15/97	37	4	12	23.08	5	6.54	14.62	Elimia floridensis	27	Excellent
Little Wekiva River near Edgewater Drive	3004	20010101	01/15/97	33	2	15	55.47	5	18.98	17.52	Polypedium illinoense grp.	27	Excellent
Lit Wekiva Canal at Oranole Rd	3004	20010133	01/15/97	24	3	13	66.27	6	22.29	27.71	Polypedium illinoense grp.	25	Good
Crane Strand Canal, 50 yds above City Industries	3014	20010325	12/16/96	35	4	10	30.81	14	15.27	25.49	Hebetancylus excentricus	33	Excellent
Crane Strand Canal, 50 yds below City Industries	3014	20010326	12/16/96	26	1	13	41.59	10	12.62	21.03	Hyalella azteca/ Polypedium illinoense	25	Good
Crane Strand Canal upstream of University Blvd.	3014	20010357	07/14/99	21	1	8	14.67	3	13.33	52	Hyalella azteca	17	Poor
Bithlo Branch just upstream of Old SR 50, Bithlo	3022	20010350	07/13/99	18	3	6	11.45	4	11.07	45.04	Stenelmis	19	Poor
Long Branch at CR 13 S at Bithlo	3030	20010384	07/13/99	26	1	9	22	10	39	20	Cheumatopsyche	27	Excellent
Unnamed wetland, control for OCPUD STP FYI	3033	20010611	09/15/92	22	3	6	44.19	4	2.33	16.28	Kiefferulus	19	Poor

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	%Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Unnamed wetland, control for OCPUD STP FYI	3033	20010611	11/09/98	21	0	7	48.48	0	5.05	19.19	Oribatei	17	Poor
Unnamed wetland, test for OCPUD STP FYI	3037	20010610	09/15/92	34	2	13	39.5	6	0.42	28.57	Caenis	23	Good
Unnamed wetland, test for OCPUD STP FYI	3037	20010610	11/09/98	26	1	12	72.73	4	24.09	42.73	Tanytarsus sp. fepler	19	Poor
St Johns River Chan Mark 72	2893A	20030373	02/10/92	16	1	6	9.46	5	2.58	37.82	Palaemonetes paludosus	17	Poor
St Johns R, ref site for Deland STP FYI	2893B	20010302	04/05/93	26	2	8	35.92	7	2.46	38.73	Hyalella azteca	25	Good
St Johns R at SR44 BDG, 1st for Deland STP FYI	2893B	20010154	04/05/93	22	0	6	12.9	5	0.54	56.99	Hyalella azteca	17	Poor
Blue Springs run in Volusia Co.	2893B	SPRINGS 005	10/17/00	18	0	4	15.33	1	2.92	27.01	Limnodrilus hoffmeisteri	15	Poor
Blue Springs run in Volusia Co.	2893B	SPRINGS 005	03/21/01	18	0	5	31.93	4	1.81	27.11	Pyrgophorus platyrachis	17	Poor
Blue Springs run in Volusia Co.	2893B	SPRINGS 005	10/16/01	18	1	3	25.96	0	0	26.92	Pyrgophorus platyrachis	15	Poor
St Johns R at Hwy 17-19, ref for FP&L Sanford FYI	2893C	20010003	03/22/93	18	1	8	34.07	6	1.65	25.27	Hyalella azteca	19	Poor
St. Johns R , test site for FP&L Sanford FYI	2893C	20010622	03/22/93	18	1	8	23.47	5	7.14	54.08	Hyalella azteca	17	Poor
St Johns R at Hwy 17-19, ref for FP&L Sanford FYI	2893C	20010003	11/13/95	20	2	0	0	2	1.04	69.27	Hyalella azteca	13	Severely Degraded
St John River 100 yds downstrm Sanford discharge	2893C	20010106	11/13/95	22	2	6	8.74	2	1.09	70.49	Hyalella azteca	15	Poor
St Johns River at Hwy 40 near Astor	2893Z	20010002	09/29/92	25	3	6	26.83	4	7.88	43.97	Hyalella azteca	21	Good

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	%Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
St Johns River at Hwy 40 near Astor	2893Z	20010002	03/24/92	27	1	11	15.8	3	3.77	48.46	Hyaella azteca	19	Poor
St Johns River at Hwy 40 near Astor	2893Z	20010002	08/03/93	21	3	6	18.62	4	39.66	26.21	Corophium lacustre	23	Good
St Johns River at Hwy 40 near Astor	2893Z	20010002	03/30/93	29	1	13	68.61	6	22.42	36.77	Cladotany-tarsus	23	Good
St Johns River at Hwy 40 near Astor	2893Z	20010002	02/01/94	14	0	5	9.29	4	42.35	36.61	Corophium lacustre	19	Poor
Blackwater Creek at Hwy 44A	2929A	20010455	08/11/92	34	6	10	11.94	16	3.23	20.16	Hyaella azteca	29	Excellent
Blackwater Creek at Hwy 44A	2929A	20010455	07/19/94	34	4	10	20.72	17	5.41	26.13	Hyaella azteca	29	Excellent
Blackwater Creek at Hwy 44A	2929A	20010455	09/28/93	34	6	12	22.83	17	5.91	25.98	Caecidotea	29	Excellent
Blackwater Creek at Hwy 44A	2929A	20010455	02/08/93	37	6	13	23.31	21	8.65	23.31	Crangonyx	31	Excellent
Blackwater Creek at Hwy 44A	2929A	20010455	03/29/94	29	4	13	53.21	17	11.01	16.51	Polypedium illinoense grp.	29	Excellent
Blackwater Creek at Hwy 44A	2929A	20010455	02/07/95	28	1	10	16.78	10	14.34	48.95	Asellus	25	Good
Blackwater Creek at Hwy 44A	2929A	20010455	08/26/96	32	8	7	32.54	16	34.92	9.52	Chimarra	31	Excellent
Blackwater Creek at Hwy 44A	2929A	20010455	02/23/99	36	6	11	32.63	19	23.16	10.53	Baetis pygmaeus	33	Excellent
Big Wekiva River downstream of Little Wekiva	2956A	20010126	01/15/97	51	12	18	37.05	26	25	9.38	Polypedium illinoense grp.	33	Excellent
Wekiva R upstr of Blackwater Cr	2956A	20010438	01/11/99	51	11	17	54.02	26	27.52	24.35	Cricotopus binctus	31	Excellent
Blackwater Rv. @ 50 up from wekiva	2956A	20010341	01/11/99	36	13	12	46.36	22	22.85	12.58	Gammarus	33	Excellent

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	% Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Blackwater Rv. @ 50 up from Wekiva	2956A	20010341	01/11/99	37	12	13	44.88	22	28.74	7.87	Hemerodromia/Oecetis georgia/Tanytarsus sp. teple	33	Excellent
Big Wekiva River downstream of Little Wekiva	2956A	20010126	01/13/99	56	10	23	47.37	25	15.5	7.6	Pisidiidae/Tanytarsus sp. c epler	33	Excellent
Blackwater Rv. @ 50 up from wekiva	2956A	20010341	09/13/99	36	9	10	35.56	18	15	7.78	Hyalella azteca	33	Excellent
Wekiva R upstr of Blackwater Cr	2956A	20010438	09/13/99	39	9	15	29.92	21	3.03	29.92	Hyalella azteca	29	Excellent
Wekiva River 0.5 miles from St Johns River	2956B	20010125	01/11/99	40	9	16	51.7	16	19.73	14.29	Tanytarsus sp. c epler	33	Excellent
Wekiva River 0.5 miles from St Johns River	2956B	20010125	09/13/99	25	6	5	11.58	11	2.11	48.42	Hyalella azteca	23	Good
Sweetwater Ck, below Wekiva River Hunt Club STP	2956X	20010669	04/15/96	33	3	12	44.9	14	40.14	23.81	Rheotanytarsus distinctissimus grp.	31	Excellent
Sweetwater Ck, upstream of Wekiva Hunt Club STP	2956X	20010668	04/15/96	31	3	15	65.5	15	37.43	18.13	Rheotanytarsus distinctissimus grp.	29	Excellent
Lt Wekiva R, 100 yd upstr of Altamonte Spgs STP	2987B	20010203	10/31/94	14	2	7	52.99	8	41.03	38.46	Cheumatopsyche	23	Good
Lt Wekiva R, 100 yd downstr of Altamonte Spgs STP	2987B	20010204	10/31/94	11	2	4	25.33	4	40	40	Cheumatopsyche	19	Poor
Lt Wekiva R, 100 yd upstr of Altamonte Spgs STP	2987B	20010203	01/15/97	41	8	14	43.73	16	30.42	14.45	Cheumatopsyche	33	Excellent

Table D-3 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	# of EPT Taxa ^a	# of Chironomid		FL Index Score ^b	%Filter Feeders	% Dominant Taxon	Dominant Taxon	SCI ^c	
						Taxa	% Diptera					Score	Evaluation
Lt Wekiva R, 100 yd downstr of Altamonte Spgs STP	2987B	20010204	01/15/97	44	4	26	42.29	19	13.64	20.16	Stylaria lacustris	31	Excellent
Big Econlockhatchee River at Snowhill Rd	2991A	20010300	02/26/96	32	5	11	25.77	10	11.04	21.47	Microcyl-loepus pusillus	31	Excellent
Little Econ R at confluence with Big Econ R	2991A	20010041	02/26/96	25	5	9	60	16	16.76	38.92	Polypedilum convictum grp.	27	Excellent
Gee Cr SR #419/434 Midstream	2994A	20010185	03/03/97	28	3	12	55.19	13	13.64	25.97	Polypedilum convictum grp.	27	Excellent
Unnamed ditch, ref for Park Manor STP FYI	3024A	20010352	01/15/92	35	3	13	49.14	15	9.05	14.66	Palpomyia/bezzia grp.	29	Excellent
Unnamed ditch, test for Park Manor STP FYI	3024A	20010351	01/15/92	25	3	12	84.51	12	7.04	46.01	Polypedilum ilinoense grp.	21	Good
Unnamed ditch, ref for Park Manor STP FYI	3024A	20010352	10/14/96	21	5	7	37.17	7	23.89	25.66	Polypedilum ilinoense grp.	27	Excellent
Unnamed ditch, test for Park Manor STP FYI	3024A	20010351	10/14/96	35	6	7	64.2	15	10.9	55.99	Polypedilum ilinoense grp.	25	Good

^a Total number of invertebrate taxa in the orders Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies). Otherwise known as the EPT Index.

^b Florida Index score. Methods per Ross, L.T. 1990. *Methods for Aquatic Biology*. Technical Series 10(1):1-47, Tallahassee, Florida: Florida Department of Environmental Regulation.

^c Stream Condition Index score and evaluation, per method shown for peninsular Florida in Barbour, M.T., J. Gerritsen, and J.S. White. 1996. *Development of the Stream Condition Index (SCI) for Florida*. Prepared for the Florida Department of Environmental Protection. Owings Mills, Maryland: Tetra Tech, Inc.

Table D-4: Analysis of Macroinvertebrate Data from Samples Taken in the Middle St. Johns River Basin by the BioRecon Sample Collection Method (FDEP SOP # FS-7410 and # LT-7100)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	Score	FL Index ^a	Score	# of EPT Taxa ^b	Score	Overall Evaluation
Juniper Creek at Highway 19	2905	20010454	03/04/96	23	passed	9	failed	5	passed	Suspect
Juniper Creek at Highway 19	2905	20010454	08/29/95	27	passed	17	passed	4	passed	Healthy
Mormon Branch upstream of SR 19 in Ocala NF	2905	20030920	02/01/00	38	passed	27	passed	9	passed	Healthy
Deep Creek/Lake Ashby Canal at Osteen/Maytown Rd	2925	20010254	09/12/97	27	passed	11	passed	2	failed	Suspect
Rock Springs Run at Camp Cozy, Wekiva Springs SP	2967	20010277	07/18/97	29	passed	19	passed	7	passed	Healthy
Soldier Cr SR #419 midstream	2986	20010184	05/30/00	30	passed	13	passed	5	passed	Healthy
Lit Wekiva River at SR 434	2987	20010137	09/06/95	21	passed	12	passed	5	passed	Healthy
L Wekiva R at Clemson Rd Brg	2987	20010134	08/09/96	21	passed	7	failed	4	passed	Suspect
Lit Wekiva River at SR 434	2987	20010137	02/28/01	31	passed	9	failed	4	passed	Suspect
Salt Creek @ Packard Ave.	2990	20010051	05/02/97	25	passed	11	passed	1	failed	Suspect
Majestic Road Canal (RDD) 50 m above Econ River	2991	20010349	01/27/99	26	passed	16	passed	7	passed	Healthy
Econ R. above Quarterly Pkwy Canal (Hal Scott)	2991	20010346	01/26/99	28	passed	16	passed	8	passed	Healthy
Big Econlockhatchee R SR #420	2991	20010129	01/26/99	24	passed	12	passed	6	passed	Healthy
Econ River at Old Cheney Highway	2991	20010356	01/27/99	25	passed	18	passed	7	passed	Healthy
Unnamed trib of Econ R. 85m upstream of SR 420	2991	20010466	02/02/00	25	passed	10	passed	6	passed	Healthy
Sweetwater Cr just upstream of Deleon St, Oviedo	2996	20010011	10/04/95	21	passed	8	failed	1	failed	Suspect
Sweetwater Cr just upstream of Deleon St, Oviedo	2996	20010011	03/26/96	25	passed	13	passed	3	failed	Suspect
Howel ICreek @ Winter Springs Blvd.	2997	20010042	08/22/96	26	passed	17	passed	8	passed	Healthy
Howell Cr SR #434 midstream	2997	20010186	05/30/00	25	passed	17	passed	6	passed	Healthy
Bear Creek @ Northern way bridge	2999	20010049	03/03/97	32	passed	13	passed	6	passed	Healthy
Little Econ R at Curry Ford Rd	3001	20010040	02/22/00	33	passed	13	passed	8	passed	Healthy
Crane Strand 300 yards upstream of SR 436	3014	20010013	03/27/96	18	passed	1	failed	3	failed	Suspect
Crane Strand Canal upstream of University/Blvd.	3014	20010357	01/26/99	15	failed	3	failed	1	failed	Impaired

Table D-4 (continued)

Waterbody	WBID	STORET Station #	Sample Date	# of Taxa	Score	FL Index ^a	Score	# of EPT Taxa ^b	Score	Overall Evaluation
Crane Strand Canal upstream of University Blvd.	3014	20010357	07/14/99	23	passed	3	failed	2	failed	Suspect
Bithlo Branch just upstream of Old SR 50, Bithlo	3022	20010350	01/26/99	20	passed	9	failed	5	passed	Suspect
Long Branch at CR 13 S at Bithlo	3030	20010384	01/09/98	28	passed	8	failed	3	failed	Suspect
Long Branch at CR 13 S at Bithlo	3030	20010384	01/26/99	21	passed	9	failed	3	failed	Suspect
Nettleton Canal (RDD) 50 m above Econ River	3041	20010348	01/27/99	28	passed	17	passed	7	passed	Healthy
Nettleton Canal (RDD) 50 m above Econ River	3041	20010348	02/22/00	28	passed	17	passed	9	passed	Healthy
Quarterly Parkway Canal (RDD) 50 m above Econ R.	3045	20010347	01/26/99	19	passed	16	passed	4	passed	Healthy
Reynolds Pkwy Canal (RDD) 50 m above Econ River	3050	20010345	01/26/99	20	passed	15	passed	6	passed	Healthy
Big Econlockhatchee River at Snowhill Rd	2991 A	20010300	01/26/99	24	passed	18	passed	6	passed	Healthy
Big Econlockhatchee R SR #419	2991 A	20010130	01/26/99	22	passed	18	passed	9	passed	Healthy
Little Econ R at confluence with Big Econ R	2991 A	20010041	01/26/99	19	passed	18	passed	8	passed	Healthy
Mills Branch at Lk Mills Pk boardwalk, Chuluota	3003 A	20010467	10/07/99	15	failed	4	failed	1	failed	Impaired
Mills Branch at Lk Mills Pk boardwalk, Chuluota	3003 A	20010467	03/05/01	23	passed	5	failed	3	failed	Suspect
Evaluation Thresholds: Peninsula				>18		>10		>4		

Table D-5: Analysis of Hester-Dendy Data from Samples Taken in the Middle St. Johns River Basin

Waterbody	WBID	Control Site STORET Station #	Test Site STORET Station #	Sample Date	Control Site Shannon-Wiener Score ^a	Test Site Shannon-Wiener Score	Rule 62- 302.530(11), F.A.C., Meets Criteria
Lincoln Heights STP FYI	2962	20010630	20010632	05/04/93	3.24	3.19	yes (passed)
Lincoln Heights STP FYI	2962	20010630	20010632	08/18/97	3.07	2.46	yes (passed)
Grand Strand Canal	3014	20010325	20010326	12/16/96	2.5	2.85	yes (passed)
Deland STP FYI	2893B	20010302	20010154	04/05/93	3.73	2.95	yes (passed)
Wekiva River Hunt Club STP	2956X	20010669	20010668	04/15/96	3.24	3.19	yes (passed)
Park Manor STP FYI	3024A	20010352	20010351	01/15/92	3.32	3.16	yes (passed)

^a Shannon-Wiener Diversity Index score. Methods based on Pielou, E. 1977. *Mathematical Ecology*. New York: John Wiley and Sons.

^b Only test sites with associated background sites were evaluated.

Table D-6: Analysis of Lake Condition Index (LCI) Data from Samples Taken in the Middle St. Johns River Basin*

Waterbody	WBID	STORET Station#	Gear Type	Sample Date	# of Taxa	# of EOT Taxa ^a	% EOT Taxa	Shannon -Wiener Score ^b	Hulbert Index Score ^c	% Diptera	pH	Color (PCUs)	LCI ^d	
													Score	Evaluation
Wildcat Lake-Center of Lake	2905C	20020504	PetitePonr	09/25/00	19	3	11.22	3.46	16	64.29	4.38	15	60.78	very good
Wildcat Lake-Center of Lake	2905C	20020504	PetitePonr	09/25/00	12	1	7.45	3.15	10	69.15	4.38	15	40.86	very good
Sellars Lake-Center of Lake	2918C	20020496	PetitePonr	10/09/00	21	3	8.7	3.57	9	73.04	3.98	5	52.68	very good
Lake Brantley at center	2956F	20010215	PetitePonr	10/17/00	19	1	3.25	3.31	13	64.23	6.79	15	47.08	good

*Data analyzed based on criteria for clear lakes.

^a Total number of invertebrate taxa in the orders Ephemeroptera (mayflies), Odonata (dragonflies and damselflies) and Trichoptera (caddisflies).

^b Shannon-Wiener Diversity Index score. Methods based on Pielou, E. 1977. *Mathematical Ecology*. New York: John Wiley and Sons.

^c Hulbert Index score. Methods per Hulbert, J.L. 1990. *A Proposed Lake Condition Index for Florida*. Tallahassee, Florida: Florida Department of Environmental Regulation.

^d Lake Condition Index score and evaluation, per method shown for clear Florida lakes in Geritsen, J., B. Jessup, E. Leppo, and J. White. 2000. *Development of Lake Condition Index for Florida*. Owings Mills, Maryland: Tetra Tech, Inc.

Table D-7: Bioassessment Summary for the Middle St. Johns Basin for the Period January 1, 1992, through December 31, 2001

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule 62-302.530(1), FAC	Overall		
St Johns River Chan Mark 72	2893A	20030373	02/10/92	Poor								yes
Deland STP FYI	2893B	20010154	04/05/93						yes	passed		no
St Johns R at SR 44 BDG, 1st for DeLand STP FYI	2893B	20010154	04/05/93	Poor								yes
St Johns R, ref site for DeLand STP FYI	2893B	20010302	04/05/93	Good								no
Blue Springs run in Volusia Co.	2893B	SPRINGS 005	10/17/00	Poor								yes
Blue Springs run in Volusia Co.	2893B	SPRINGS 005	03/21/01	Poor								yes
Blue Springs run in Volusia Co.	2893B	SPRINGS 005	10/16/01	Poor								yes
St Johns R at Hwy 17-19,ref for FP&L Sanford FYI	2893C	20010003	03/22/93	Poor								yes
St. Johns R , test fite for FP&L Sanford FYI	2893C	20010622	03/22/93	Poor								yes
St John River 100 yds dwnstrm Sanford discharge	2893C	20010106	11/13/95	Poor								yes
St Johns R at Hwy HWY 17-19,ref for FP&L Sanford FYI	2893C	20010003	11/13/95	Severely Degraded								yes
St Johns River at Hwy 40 near Astor	2893Z	20010002	03/24/92	Poor								yes
St Johns River at Hwy 40 near Astor	2893Z	20010002	09/29/92	Good								no
St Johns River at Hwy 40 near Astor	2893Z	20010002	03/30/93	Good								no
St Johns River at Hwy 40 near Astor	2893Z	20010002	08/03/93	Good								no

Table D-7 (continued)

[illegible]

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule			
									62-302.530(1), FAC	Overall		
Deep Creek @ Hwy 17 Bridge	2908	20010524	09/23/97	Excellent								no
Sellers Lake center of lake	2918C	20020496	10/09/00								very good	no
Deep Creek/Lake Ashby Canal at Osteen/Maytown Rd	2925	20010254	09/12/97		passed	passed	failed	Suspect				no
Blackwater Creek at Hwy 44A	2929A	20010455	08/11/92	Excellent								no
Blackwater Creek at Hwy 44A	2929A	20010455	02/08/93	Excellent								no
Blackwater Creek at Hwy 44A	2929A	20010455	09/28/93	Excellent								no
Blackwater Creek at Hwy 44A	2929A	20010455	03/29/94	Excellent								no
Blackwater Creek at Hwy 44A	2929A	20010455	07/19/94	Excellent								no
Blackwater Creek at Hwy 44A	2929A	20010455	02/07/95	Good								no
Blackwater Creek at Hwy 44A	2929A	20010455	08/26/96	Excellent								no
Blackwater Creek at Hwy 44A	2929A	20010455	02/23/99	Excellent								no
Ashby Creek at County Park	2936	20010197	02/10/97	Excellent								no
Big Wekiva Riv at Wekiva Marina	2956	20010377	02/11/92	Excellent								no
Big Wekiva River upstream if Little Wekiva River	2956	20010103	01/15/97	Excellent								no
Big Wekiva River at Wekiva Marina	2956	20010377	01/12/99	Excellent								no
Wekiva River upstream of Rock Springs	2956	20010431	01/12/99	Excellent								no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule 62-302.530(1), FAC	Overall		
Big Wekiva River upstream of Little Wekiva	2956	20010103	01/13/99	Excellent								No
Wakiwa (Wekiva) R. ab. Rock Spgs run	2956	SPRINGS 006	10/16/00	Good								No
Wakiwa (Wekiva) R. ab. Rock Spgs run	2956	SPRINGS 006	03/21/01	Excellent								No
Wakiwa (Wekiva) R. ab. Rock Spgs run	2956	SPRINGS 006	10/16/01	Good								No
Big Wekiva River downstream of Little Wekiva	2956A	20010126	01/15/97	Excellent								No
Blackwater Rv. @ 50 up from wekiva	2956A	20010341	01/11/99	Excellent								No
Blackwater Rv. @ 50 up from wekiva	2956A	20010341	01/11/99	Excellent								No
Wekiva R upstr of Blackwater Cr	2956A	20010438	01/11/99	Excellent								No
Big Wekiva River downstream of Little Wekiva	2956A	20010126	01/13/99	Excellent								No
Blackwater Rv. @ 50 up from wekiva	2956A	20010341	09/13/99	Excellent								No
Wekiva R upstr of Blackwater Cr	2956A	20010438	09/13/99	Excellent								no
Wekiva River 0.5 miles from St Johns River	2956B	20010125	01/11/99	Excellent								no
Wekiva River 0.5 miles from St Johns River	2956B	20010125	09/13/99	Good								no
Lake Brantley at center	2956F	20010215	10/17/00								good	no
Wekiva River Hunt Club STP	2956X	20010668	04/15/96					Yes		passed		No
Sweetwater Cr. Below Wekiva Riv Hunt Club STP	2956X	20010669	04/15/96	Excellent								no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule			
									62-302.530(1), FAC	Overall		
Sweetwater Ck, upstream of Wekiva Hunt Club STP	2956X	20010668	04/15/96	Excellent								no
Yankee outlet @ jeep trail	2961	20010344	01/14/99	Good								no
Lincoln Heights STP FYI	2962	20010632	05/04/93						yes	passed		no
Smith Canal, ref for Lincoln Heights STP FYI	2962	20010630	05/04/93	Poor								yes
Smith Canal, test for Lincoln Heights STP FYI	2962	20010632	05/04/93	Poor								yes
Lincoln Heights STP FYI	2962	20010632	08/18/97						yes	passed		no
Smith Canal, ref for Lincoln Heights STP FYI	2962	20010630	08/18/97	Poor								yes
Smith Canal, test for Lincoln Heights STP FYI	2962	20010632	08/18/97	Good								no
Rock Springs Run at Camp Cozy, Wekiva Springs SP	2967	20010277	07/18/97		passed	passed	passed	Heal -thy				no
Rock spring run 50m upstrm Wekiva River	2967	20010342	01/12/99	Excellent								no
ditch at Airport near Lake Jessup	2982	20010187	08/25/97	Good								no
Elder Spring Run @ Myrtle Ave.	2984	20010294	08/25/97	Good								no
Soldier Cr SR #419 midstream	2986	20010184	07/09/96	Good								no
Soldier Cr SR #419 midstream	2986	20010184	05/30/00		passed	passed	passed	Heal -thy				no
Lit Wekiva River at SR 434	2987	20010137	09/06/95		passed	passed	passed	Heal -thy				no
L Wekiva R at Clemson Rd Brg	2987	20010134	08/09/96		passed	failed	passed	Sus-pect				no
Lit Wekiva River at SR 434	2987	20010137	01/15/97	Excellent								no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule 62-302.530(1), FAC	Overall		
Little Wekiva River at Betsy Ln off Delk Rd	2987	20010102	01/15/97	Excellent								no
Little Wekiva 50m up from Big Wekiva	2987	20010343	01/13/99	Excellent								no
Lit Wekiva River at SR 434	2987	20010137	02/28/01		passed	failed	passed	Suspect				no
Lt Wekiva R, 100 yd dwnstr of Altamonte Spgs STP	2987B	20010204	10/31/94	Poor								yes
Lt Wekiva R, 100 yd upstr of Altamonte Spgs STP	2987B	20010203	10/31/94	Good								no
Lt Wekiva R, 100 yd dwnstr of Altamonte Spgs STP	2987B	20010204	01/15/97	Excellent								No
Lt Wekiva R, 100 yd upstr of Altamonte Spgs STP	2987B	20010203	01/15/97	Excellent								No
Salt Creek @ Packard Ave.	2990	20010051	05/02/97		passed	passed	failed	Suspect				No
Salt Creek @ Packard Ave.	2990	20010051	08/12/97	Poor								Yes
Big Econlockhatchee R SR #420	2991	20010129	02/18/92	Excellent								No
Big Econlockhatchee R SR #420	2991	20010129	09/08/92	Excellent								No
Big Econlockhatchee R SR #420	2991	20010129	03/09/93	Excellent								No
Big Econlockhatchee R SR #420	2991	20010129	09/21/93	Excellent								No
Big Econlockhatchee R SR #420	2991	20010129	03/22/94	Excellent								no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule 62-302.530(1), FAC			
									Overall			
Big Econlockhatchee R SR #420	2991	20010129	08/16/94	Good								no
Big Econlockhatchee R SR #420	2991	20010129	02/14/95	Excellent								no
Big Econlockhatchee R SR #420	2991	20010129	02/26/96	Good								no
Big Econlockhatchee R SR #420	2991	20010129	09/02/97	Excellent								no
Big Econlockhatchee R SR #420	2991	20010129	01/26/99		passed	passed	passed	Heal -thy				no
Econ R. above Quarterly Pkwy Canal (Hal Scott)	2991	20010346	01/26/99		passed	passed	passed	Heal -thy				no
Econ River at Old Cheney Highway	2991	20010356	01/27/99		passed	passed	passed	Heal -thy				no
Majestic Road Canal (RDD) 50 m above Econ River	2991	20010349	01/27/99		passed	passed	passed	Heal -thy				no
Unnamed trib of Econ R. 85m upstream of SR 420	2991	20010466	02/02/00		passed	passed	passed	Heal -thy				no
Big Econlockhatchee River at Snowhill Rd	2991A	20010300	02/26/96	Excellent								no
Little Econ R at confluence with Big Econ R	2991A	20010041	02/26/96	Excellent								no
Big Econlockhatchee R SR #419	2991A	20010130	01/26/99		passed	passed	passed	Heal thy				no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule 62-302.530(1), FAC	Overall		
Big Econlockhatchee River at Snowhill Rd	2991A	20010300	01/26/99		passed	passed	passed	Heal-thy				no
Little Econ R at confluence with Big Econ R	2991A	20010041	01/26/99		passed	passed	passed	Heal-thy				no
Black Sweetwater @ Howard Ave.	2992	20010354	09/24/97	Poor								yes
Gee Cr SR #419/434 midstream	2994A	20010185	03/03/97	Excellent								no
Shortcut canal 100 yds. downstrm of Howard Av	2995	20010127	09/08/97	Excellent								no
Sweetwater Cr just upstream of Deleon St, Oviedo	2996	20010011	10/04/95		passed	failed	failed	Sus-pect				no
Sweetwater Cr just upstream of Deleon St, Oviedo	2996	20010011	03/26/96		passed	passed	failed	Sus-pect				no
Sweetwater Creek, 0.15 MI S of Howard Ave.	2996	20010090	08/12/97	Poor								yes
Howell Cr SR #434 midstream	2997	20010186	07/09/96	Good								no
Howell Creek @ Winter Springs Blvd.	2997	20010042	08/22/96		passed	passed	passed	Heal-thy				no
Howell Creek @ Winter Springs Blvd.	2997	20010042	08/18/97	Good								no
Howell Cr SR #434 midstream	2997	20010186	05/30/00		passed	passed	passed	Heal-thy				no
Bear Creek @ Northern way bridge	2999	20010049	03/03/97		passed	passed	passed	Heal-thy				no
Bear Creek @ Northern way bridge	2999	20010049	09/24/97	Excellent								no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule			
									62-302.530(1), FAC	Overall		
Little Econ R, 100 ft above Iron Bridge outfall	3001	20011041	09/15/92	Poor								yes
Little Econ R, 100 ft below Iron Bridge outfall	3001	20011008	09/15/92	Good								no
Little Econ R at Berry Dease Rd	3001	20010025	02/26/96	Excellent								no
Little Econ R at Curry Ford Rd	3001	20010040	02/26/96	Excellent								no
Little Econ R at Valencia Community College	3001	20010016	02/26/96	Excellent								no
Little Econ R, 100 ft above Iron Bridge outfall	3001	20011041	02/26/96	Excellent								no
Little Econ R, 100 ft below Iron Bridge outfall	3001	20011008	02/26/96	Good								no
Little Econ River at Buck Rd	3001	20010015	02/26/96	Excellent								no
Little Econ R at Curry Ford Rd	3001	20010040	02/22/00		passed	passed	passed	Heal-thy				no
Mills Creek @ Brumley Rd Bridge	3003	20010327	02/10/97	Excellent								no
Mills Creek @ Brumley Rd Bridge	3003	20010327	09/02/97	Excellent								no
Mills Branch at Lk Mills Pk boardwalk, Chuluota	3003A	20010467	10/07/99		failed	failed	failed	Impaired				yes
Mills Branch at Lk Mills Pk boardwalk, Chuluota	3003A	20010467	03/05/01		passed	failed	failed	Suspect				no
Lit Wekiva Canal at Oranole Rd	3004	20010133	01/15/97	Good								no
Little Wekiva River at Princeton & Silver Star	3004	20010100	01/15/97	Excellent								no
Little Wekiva River near Edgewater Drive	3004	20010101	01/15/97	Excellent								no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule			
									62-302.530(1), FAC	Overall		
Crane Strand 300 yards upstream of SR 436	3014	20010013	03/27/96		passed	failed	failed	Suspect				no
Grand Strand Canal	3014	20010326	12/16/96						yes	passed		no
Grand Strand Canal, 50 yds above City Industries	3014	20010325	12/16/96	Excellent								no
Crane Strand Canal, 50 yds below City Industries	3014	20010326	12/16/96	Good								no
Crane Strand Canal upstream of University Blvd.	3014	20010357	01/26/99		failed	failed	failed	Impaired				yes
Crane Strand Canal upstream of University Blvd.	3014	20010357	07/14/99	Poor								yes
Crane Strand Canal upstream of University Blvd.	3014	20010357	07/14/99		passed	failed	failed	Suspect				no
Bithlo Branch just upstream of Old SR 50, Bithlo	3022	20010350	01/26/99		passed	failed	passed	Suspect				no
Bithlo Branch just upstream of Old SR 50, Bithlo	3022	20010350	07/13/99	Poor								yes
Park Manor STP FYI	3024A	20010351	01/15/92						yes	passed		no
Unnamed ditch, ref for Park Manor STP FYI	3024A	20010352	01/15/92	Excellent								no
Unnamed ditch, test for Park Manor STP FYI	3024A	20010351	01/15/92	Good								no
Unnamed ditch, ref for Park Manor STP FYI	3024A	20010352	10/14/96	Excellent								no
Unnamed ditch, test for Park Manor STP FYI	3024A	20010351	10/14/96	Good								no
Long Branch at CR 13 S at Bithlo	3030	20010384	01/09/98		passed	failed	failed	Suspect				no

Table D-7 (continued)

Waterbody	WBID	STORET Station#	Sample Date	SCI	BioRecon				HD		LCI	Potentially Impaired per Rule 62-303.330, FAC
					# of Taxa	FL Index	#of EPT Taxa	Over-all	Meets Water Quality Standards per Rule			
									62-302.530(1), FAC	Overall		
Long Branch at CR 13 S at Bithlo	3030	20010384	01/26/99		passed	failed	failed	Suspect				no
Long Branch at CR 13 S at Bithlo	3030	20010384	07/13/99	Excellent								no
Unnamed wetland, control for OCPUD STP FYI	3033	20010611	09/15/92	Poor								yes
Unnamed wetland, control for OCPUD STP FYI	3033	20010611	11/09/98	Poor								yes
Unnamed wetland, test for OCPUD STP FYI	3037	20010610	09/15/92	Good								no
Unnamed wetland, test for OCPUD STP FYI	3037	20010610	11/09/98	Poor								yes
Nettleton Canal (RDD) 50 m above Econ River	3041	20010348	01/27/99		passed	passed	passed	Heal-thy				no
Nettleton Canal (RDD) 50 m above Econ River	3041	20010348	02/22/00		passed	passed	passed	Heal-thy				no
Quarterly Parkway Canal (RDD) 50 m above Econ R.	3045	20010347	01/26/99		passed	passed	passed	Heal-thy				no
Reynolds Pkwy Canal (RDD) 50 m above Econ River	3050	20010345	01/26/99		passed	passed	passed	Heal-thy				no

Appendix E: Middle St. Johns Basin Permitted Facilities

Table E.1: Permitted Domestic and Industrial Facilities Discharging to Surface Waters in the Middle St. Johns Basin

[illegible]

Table E.1 (continued)

Facility Name	Facility Permit Number	Facility Type *	Summary of Treatment Process	Permit Monitoring Conditions									Latitude	Longitude
Lake Monroe Planning Unit														
FPL SANFORD POWER PLANT	FL0001554	Industrial Wastewater	ON-CONTACT COOLING H2O & BOILER BLOWDWD W/ NO TREATMENT DISCH TO ST JOHNS RIVER. METAL CLEANING WASTES, ETC. REC SECONDARY TREATMENT AND DISCHARGED TO POND.	180	180	X					X	X		
SANFORD/NORTH	FL0020141	Domestic WWTP	C.M./A.S. STP W/REUSE IRRIGATION AND WET WEATHER DISCHARGE TO LAKE MONROE	1.0	7.3	X	X	X	X	X	X	X	28°48' 57.16"	81°16' 42.01"
AMOCO SERVICE STATION # 2093	FLG040038	Petroleum Cleanup Gp (long term)												
CEMEX / SANFORD CONCRETE BATCH PLANT	FLG110320	Concrete Batch Gp	SETTLING AND REUSE FOR STRONG SETTLING AND PERCOLATION FOR WEAK		0.0 46									
INLAND MATERIALS / DELTONA CONCRETE BATCH PLANT	FLG110324	Concrete Batch Gp	SETTLING AGGREGATE RECOVERY, PERCOLATION AND REUSE	0.004	0.0 04									
DELAND / WILEY NASH	FL0020303	Domestic WWTP	CAROUSEL ACTIVATED SLUDGE STP/FILTERS PUBLIC REUSE & DISCH TO ST JOHNS RIVER	4.0	6.0	X	X	X	X	X	X	X	29°0' 36.38"	81°17' 54.28"

Table E.1 (continued)

Facility Name	Facility Permit Number	Facility Type *	Summary of Treatment Process	Permit Monitoring Conditions								Latitude	Longitude	
Lake Jesup Planning Unit														
SPRAGUE ELECTRONICS GROUNDWATER REMEDIATION	FL0171565	Industrial Wastewater	AERATION, PH ADJUSTMENT, FILTRATION	0.028	0.028	X			X			X		
INLAND MATERIALS / CASSELBERRY CONCRETE BATCH PLANT	FLG110153	Concrete Batch GP	CONCRETE UNIT TRUCK WASHOUT WASTEWATER DISPOSAL SYSTEM	0.002	0.002									
FLORIDA ROCK / OVIEDO CONCRETE BATCH PLANT	FLG110242	Concrete Batch GP	SETTLING; REUSE		0.002									
CIRCLE K STORE #7460	FLG911191	Petroleum Cleanup GP (long term)												
Lake Woodruff Planning Unit														
DELAND / WILEY NASH	FL0020303	Domestic WWTP	CAROUSEL ACTIVATED SLUDGE STP/FILTERS PUBLIC REUSE & DISCH TO ST JOHNS RIVER	4.0	6.0	X	X	X	X	X	X	X		
Wekiva River Planning Unit														
ALTAMONTE SPRINGS/ SWOFFORD	FL0033251	Domestic WWTP	AWT FACILITY WITH DISCHARGE TO LITTLE WEKIVA RIVER & "APRICOT - REUSE"	12.5	12.5	X	X	X	X	X	X	X	28°38' 32.08"	81°23' 55.57"
WEKIVA HUNT CLUB	FL0036251	Domestic WWTP	3 PARALLEL C.S. STPs W/ FILERTS/AWT W/ DISCHARGE TO SWEETWATER CREEK	2.9	2.9	X	X	X	X	X	X	X	28°41' 49.73	81°26' 1.05"
SEMINOLE COUNTY ENVIRONMENTAL SERVICES / NORTHWEST REGIONAL	FL0042625	Domestic WWTP	MODIFIED BARDENPHO/STP CHEM FLOCCULAT, FILTRATION, EFF TO 11 RIBS	2.5	2.5	X	X	X	X	X	X	X	28°49' 33.07"	81°23' 49.18"

Table E.1 (continued)

Facility Name	Facility Permit Number	Facility Type *	Summary of Treatment Process	Permit Monitoring Conditions									Latitude	Longitude
				Permitted Surface Water Discharge (mgd)	Flow	Nitrogen	Phosphorus	Dissolved Oxygen	Oxygen Demand	Suspended Solids	pH	Specific Conductance		
EWELL / WINTER GARDEN	FLG110077	Concrete Batch GP	SETTLING, RECLAMATION AND REUSE OF PROCESS WASTEWATER. DURING LARGE RAINFALL EVENTS AND WHEN THE PLANT IS NOT OPERATING EXCESS RAINWATER WILL BYPASS THE SYSTEM AND FLOW TO THE STORMWATER TREATMENT PONDS. (TYPE I WW TREATMENT)											
FLORIDA ROCK / CARDER ROAD CONCRETE BATCH PLANT	FLG110301	Concrete Batch GP	SETTLING, RECLAMATION AND REUSE OF PROCESS WASTEWATER (STRONGWASTE) NONPROCESS WASTEWATER DISCHARGED TO PERCOLATION POND AND FROM THERE THRU OUTFALL 001 TO CLASS III SURFACE WATER DURING WET WEATHER	0.005	0.005									
IDEAL STORE #108	FLG911022	Petroleum Cleanup GP (long term)	AERATION FOLLOWED BY ACTIVATED CARBON ADSORPTION											

• GP means General Permit.

** X indicates that a facility monitors for this parameter.

Table E-2: Permitted Wastewater Treatment Facilities in the Middle St. Johns Basin

Name	City	Facility Type	Status	NPDES	Design Cap (mgd)
Alexander Springs Creek Planning Unit					
SPRING CREEK ELEM SCHOOL	PAISLEY	DW	A	N	0.0090
ALEXANDER SPRINGS RECREATIONAL AREA	ASTOR PARK	DW	A	N	0.0096
COUNTRY SQUIRE MHV	PAISLEY	DW	A	N	0.0240
U.S. NAVAL TRACKING STATION STP	ASTOR	DW	A	N	0.0090
Deep Creek Planning Unit					
GENEVA ELEMENTARY SCHOOL WWTF	GENEVA	DW	A	N	0.0100
VCUD/SOUTHWEST BARN/EQUIPMENT & TRUCK WASH RECYCLE SYSTEM	OSTEEN	IW	A	N	
QUALITY INN/DELAND	DELAND	DW	A	N	0.0200
LAKE ASHBY MHP	NEW SMYRNA BEACH	DW	A	N	0.0085
CYPRESS POINT WWTF (GOLF & RV CAMPGD)	OSTEEN	DW	A	N	0.0086
LAKE HELEN VILLA	LAKE HELEN	DW	A	N	0.0320
AMERICAN BIOCLEAR RMF	SAMSULA	DW	A	N	0.0500
Econlockhatchee River Planning Unit					
TARMAC/BITHLO CONCRETE BATCH PLANT	BITHLO	IW	A	N	0.0200
AMOCO OIL STATION #60558/CAR WASH RECYCLE SYSTEM	ORLANDO	IW	A	N	
ORLANDO/IRON BRIDGE WPCF	OVIEDO	DW	A	Y	40.0000
ALAFAYA UTILITY	OVIEDO	DW	A	N	1.1000
CHULUOTA	CHULUOTA	DW	A	N	0.1000
PALM VALLEY MHP	OVIEDO	DW	A	N	0.1260
COLUMBIA ELEM SCHOOL	BITHLO	DW	A	N	0.0075
VILLAGE MARKETPLACE	ORLANDO	DW	A	N	0.0042
WINTER PARK ESTATES	WINTER PARK	DW	A	N	0.6150
CITY INDUSTRIES SUPERFUND/GW REMEDIATION TREATMENT PLANT	WINTER PARK	IW	A	Y	
AB CONCRETE	ORLANDO	CBP	A	Y	
FLORIDA ROCK/EAST ORLANDO	ORLANDO	CBP	A	Y	
ORANGE COUNTY UTILITIES DIVISION /EASTERLY SUBREGIONAL STP	ORLANDO	DW	A	Y	11.200
CHENEY ELEM SCHOOL	ORLANDO	DW	A	N	0.0120
RINKER MATERIALS/WINTER PARK CONCRETE BATCH PLANT	WINTER PARK	IW	A	N	
FAIRWAYS COUNTRY CLUB	ORLANDO	DW	A	N	0.1500
CEMEX/GOLDENROD CONCRETE BATCH PLANT	ORLANDO	CBP	A	Y	

Table E-2 (continued)

Name	City	Facility Type	Status	NPDES	Design Cap (mgd)
Econlockhatchee River Planning Unit (continued)					
BIG ECON MOBILE HOME PARK WWTF	ORLANDO	DW	A	N	0.0150
LAKE DOWNEY MHP	ORLANDO	DW	A	N	0.0150
HOLIDAY ACRES TRAILER PARK	BITHLO	DW	A	N	0.0093
CURTIS STANTON ENERGY CENTER, STP	ORLANDO	DW	A	N	0.0340
PARK MANOR ESTATES	ORLANDO	DW	A	Y	0.3500
PINE ISLE MHP	ORLANDO	DW	A	N	0.0100
PINEWOOD MHP	ORLANDO	DW	A	N	0.0050
WEDGEFIELD S/D WWTF	ORLANDO	DW	A	N	0.3680
REXAM GROUNDWATER TREATMENT FACILITY	ORLANDO	IW	A	Y	0.0720
CLEAN ARENA CAR WASH RECYCLE SYSTEM	ORLANDO	IW	A	N	0.0010
MCINERNEY FORD VEHICLE WASH RECYCLE SYSTEM	ORLANDO	IW	T	N	0.0009
OCUD/UNIVERSITY SHORES	ORLANDO	DW	A	N	1.2750
GULFSTREAM HARBOR MHP	ORLANDO	DW	A	N	0.1000
STARLIGHT RANCH MHP	ORLANDO	DW	A	N	0.1200
TENNECO 087-08	WINTER PARK	PET	A	Y	
BOBCAT OF ORLANDO/EQUIPMENT WASH RECYCLE SYSTEM	ORLANDO	IW	A	N	0.0100
ROGER HOLLER CLASSIC NISSAN	ORLANDO	IW	A	N	
UNIVERSITY VILLAGE MOBILE HOME PARK	ORLANDO	DW	A	N	0.0400
Lake George Planning Unit					
TAYLOR JR-SR HIGH SCHOOL	PIERSON	DW	A	N	0.0250
PINE ISLAND FISHING RESORT STP	LAKE GEORGE	DW	A	N	0.0080
VCUD/PINE ISLAND	SEVILLE	DW	A	N	0.0150
ST JOHNS RIVER CAMPGROUND	ASTOR	DW	A	N	0.0075
BLAIRS JUNGLE DEN	ASTOR	DW	A	N	0.0300
WELAKA WWTF	WELAKA	DW	A	N	0.0990
RIVER PARK UTILITIES WWTF	FRUITLAND	DW	A	N	0.0250
SHANNON CAR WASH	ASTOR PARK	IW	A	N	0.0049
HOLIDAY HAVEN	ASTOR	DW	A	N	0.0250
WILDWOODS CAMPGROUND	ASTOR PARK	DW	A	N	0.0075
PIERSON LAUNDROMAT	PIERSON	IW	A	N	0.0043
JUNGLE DEN	ASTOR	DW	A	N	0.0210

Table E-2 (continued)

Name	City	Facility Type	Status	NPDES	Design Cap (mgd)
Lake George Planning Unit (continued)					
PARRAMORE'S CAMPGROUND	ASTOR	DW	A	N	0.0120
ANGLERS PARADISE LODGE	WELAKA	DW	C	N	0.0100
Lake Jesup Planning Unit					
OVIEDO HIGH SCHOOL WWTF	OVIEDO	DW	A	N	0.0650
JACKSON HEIGHTS MIDDLE SCHOOL WWTF	OVIEDO	DW	A	N	0.0150
CASSELBERRY WWTF	CASSELBERRY	DW	A	N	1.4000
WINTER SPRINGS/WEST	WINTER SPRINGS	DW	A	N	1.5460
WINTER SPRINGS/EAST	WINTER SPRINGS	DW	A	N	2.0120
SEMINOLE GREYHOUND PARK STP (CD)	CASSELBERRY	DW	A	N	0.0250
OVIEDO INN (DBA TOUCAN WILLY'S RESTAURANT)	OVIEDO	DW	A	N	0.0076
FLORIDA CENTRAL COMMERCE PARK	LONGWOOD	DW	A	N	0.0950
SCES/GREENWOOD LAKES	LAKE MARY	DW	A	N	3.5000
TARMAC/LONGWOOD CONCRETE BATCH PLANT	LONGWOOD	IW	A	N	
FLORIDA ROCK/OVIEDO CONCRETE BATCH PLANT	OVIEDO	CBP	A	Y	
SHADOW HILLS WWTF	LONGWOOD	DW	A	N	0.5000
INLAND MATERIALS/CASSELBERRY CONCRETE BATCH PLANT	CASSELBERRY	CBP	A	Y	
CIRCLE K STORE #7460	LONGWOOD	PET	A	Y	
METALADE METAL WASH RECYCLE SYSTEM (FORMERLY DATAMAX)	SANFORD	IW	A	N	0.0200
SPRAGUE ELECTRONICS GROUND WATER REMEDIATION	LONGWOOD	IW	A	Y	0.0280
SUN-TECH WINDOWS INC.	SANFORD	IW	N	N	
DOT/OVIEDO MAINTENANCE YD	OVIEDO	IW	A	N	
EWELL INDUSTRIES/WINTER SPRINGS CONCRETE BATCH PLANT	LONGWOOD	IW	A	N	0.0090
SPRING HAMMOCK PARK	LONGWOOD	DW	A	N	0.0100
SCSB MAINTENANCE CONTAINMENT SYSTEM	WINTER SPRINGS	IW	A	N	0.0010
Lake Kerr Planning Unit					
JUNIPER SPRINGS RECREATIONAL AREA	SILVER SPRINGS	DW	A	N	0.0190
FOUNTAIN CENTER WWTF	SALT SPRINGS	DW	A	N	0.0028
SALT SPRINGS	SALT SPRINGS	DW	A	N	0.0850
Lake Monroe Planning Unit					
SANFORD/NORTH	SANFORD	DW	A	Y	7.3000
SIEMENS	LAKE MARY	DW	A	N	0.0350

Table E-2 (continued)

Name	City	Facility Type	Status	NPDES	Design Cap (mgd)
Lake Monroe Planning Unit (continued)					
RINKER MATERIALS/SANFORD CONCRETE BATCH PLANT	SANFORD	IW	A	N	
TWELVE OAKS RV RESORT (SW)	SANFORD	DW	A	N	0.0250
TOWN & COUNTRY RV RESORT	LAKE MONROE	DW	A	N	0.0300
CEMEX/SANFORD CONCRETE BATCH PLANT	SANFORD	CBP	A	Y	
VCUD/DELTONA NORTH	DELTONA	DW	A	N	1.2000
SUNRISE ELEMENTARY SCHOOL	DELTONA	DW	A	N	0.0210
INLAND MATERIALS/DELTONA CONCRETE BATCH PLANT	DELTONA	CBP	A	Y	
DELTONA LAKES	DELTONA	DW	A	N	1.4000
FPL SANFORD POWER PLANT	SANFORD	IW	A	Y	
PARADISE LAKES CAMPGROUND	DELTONA	DW	A	N	0.0150
KOVE ESTATES	OSTEEN	DW	A	N	0.0320
DELTONA CAR WASH	DELTONA	IW	N	N	0.0010
VCUD/MEADOWLEA ON THE RIVER	DEBARY	DW	A	N	0.0430
VOLUSIA PINES ELEM SCHOOL "T"	LAKE HELEN	DW	A	N	0.0100
AMOCO SERVICE STATION # 2093	SANFORD	PET	A	Y	
WINN DIXIE MARKETPLACE/DELTONA	DELTONA	DW	A	N	0.0200
SEMINOLE PRECAST RECYCLE SYSTEM	DEBARY	IW	A	N	
LAKE MONROE RMF	SANFORD	DW	A	N	0.0500
EWELL INDUSTRIES/ORANGE CITY CONCRETE BATCH PLANT	ORANGE CITY	IW	A	N	
STONE ISLAND WWTF	ENTERPRISE	DW	A	N	0.0060
VCUD/OSTEEN ELEMENTARY SCHOOL	OSTEEN	DW	A	N	0.0125
Lake Woodruff Planning Unit					
VCUD/FOUR TOWNES	ORANGE CITY	DW	A	N	0.3000
VCUD/SOUTHWEST REGIONAL	DEBARY	DW	A	N	0.5440
DELAND/WILEY NASH	DELAND	DW	A	Y	7.3700
RINKER MATERIALS/DELAND CONCRETE BATCH PLANT	DELAND	IW	A	N	0.0016
HIGHBANKS MARINA & CAMP RESORT	DEBARY	DW	A	N	0.0240
T.G. LEE FOODS/LIFESTYLE DIVISION	DELAND	IW	A	N	0.0690
SPARTON ELECTRONICS STP	DELEON SPRINGS	DW	A	N	0.0120
HIDDEN VALLEY MHP	DELEON SPRINGS	DW	A	N	0.0300

Table E-2 (continued)

Name	City	Facility Type	Status	NPDES	Design Cap (mgd)
Lake Woodruff Planning Unit (continued)					
ARLINGTON SQUARE APARTMENTS	DELAND	DW	A	N	0.0060
LAKEVIEW TERRACE MHP	DELAND	DW	A	N	0.0100
LINGERING LANE MHP	DELAND	DW	A	N	0.0150
ORANGE CITY COMFORT INN	ORANGE CITY	DW	A	N	0.0100
HOLLY BLUFF MARINA	DELAND	DW	A	N	0.0100
DUVALL HOME FOR RETARDED CHILDREN	GLENWOOD	DW	A	N	0.0600
SUNNY SANDS RESORT	PIERSON	DW	A	N	0.0100
LAND-O-LAKES MHC	ORANGE CITY	DW	A	N	0.0270
DAYS INN OF ORANGE CITY	ORANGE CITY	DW	A	N	0.0040
1876 HERITAGE INN	ORANGE CITY	DW	A	N	0.0100
FLORIDA POWER CORP DEBARY	DEBARY	IW	A	N	0.4200
ST JOHNS RIVER CLUB CONDO ASSOCIATION	DELAND	DW	A	N	0.0060
CANDLELIGHT MHP	ORANGE CITY	DW	A	N	0.0270
TRADERS COVE MHP	DEBARY	DW	A	N	0.0200
HONTOON ISLAND STATE PARK	DELAND	DW	A	N	0.0050
BLUE SPRING STATE PARK	ORANGE CITY	DW	A	N	0.0240
MCINNIS ELEM SCHOOL	DE LEON SPRINGS	DW	A	N	0.0100
VCUD/NORTHWEST BARN EQUIPMENT & TRUCK WASH RECYCLE SYSTEM	DELAND	IW	A	N	
EAGLES NEST S/D	ASTOR	DW	A	N	0.0100
DEERHAVEN CAMPGROUND	PAISLEY	DW	A	N	0.0250
POWELLS CAMPGROUND	ASTOR	DW	A	N	0.0120
DELEON LAUNDRY AND CAR WASH	DELEON SPRINGS	IW	A	N	0.0047
TARMAC/DELAND CONCRETE BATCH PLANT	DELAND	IW	A	N	
TROPICAL APARTMENTS & MARINA	DELAND	DW	A	N	0.0030
ICED OUT AUTO DETAILING	DELAND	IW	N	N	
DELAND/ORANGE CITY KOA CAMPGROUND	ORANGE CITY	DW	A	N	0.0150
Wekiva River Planning Unit					
EXXON STATION 4-0049/CAR WASH RECYCLE SYSTEM	ORLANDO	IW	A	N	
INLAND MATERIALS/ORANGE COUNTY CONCRETE BATCH PLANT	ORLANDO	IW	A	N	
SUNSHINE MATERIALS/LOCKHART (CBS BUILDERS)	LOCKHART	IW	A	N	
BRIGHTWOOD MANOR MHP	APOPKA	DW	A	N	0.0800

Table E-2 (continued)

Name	City	Facility Type	Status	NPDES	Design Cap (mgd)
Wekiva River Planning Unit (continued)					
RINKER MATERIALS/LOCKHART CONCRETE BATCH PLANT	LOCKHART	IW	A	N	
WEKIWA SPRINGS ST PK #2/YOUTH CAMP	APOPKA	DW	A	N	0.0075
SCES/NORTHWEST REGIONAL	SANFORD	DW	A	Y	2.5000
WOODLANDS (DES PINAR)	LONGWOOD	DW	A	N	0.5000
WEKIVA HUNT CLUB	LONGWOOD	DW	A	Y	2.9000
FOREST LAKE ELEMENTARY SCHOOL WWTF	LONGWOOD	DW	A	N	0.0100
SHINERS CAR WASH RECYCLE SYSTEM/WEST 436	ALTAMONTE SPRINGS	IW	A	N	
WEKIWA SPRINGS ST PK #1/MAIN AREA	APOPKA	DW	A	N	0.0200
MAITLAND CENTER COOLING TOWER	MAITLAND	IW	N	N	
MASSEY CADILLAC	ORLANDO	IW	A	N	
REED NISSAN/KIA CAR WASH RECYCLE	ORLANDO	IW	A	N	
ALTAMONTE SPRINGS/SWOFFORD	ALTAMONTE SPRINGS	DW	A	Y	12.5000
BOGGY CREEK GANG CAMP	EUSTIS	DW	A	N	0.0300
ROCK SPRINGS MHP	APOPKA	DW	A	N	0.1500
ZELLWOOD STATION MHP	ZELLWOOD	DW	A	N	0.3000
OCPUD/KELLY PARK	APOPKA	DW	A	N	0.0300
MAGNOLIA MOBILE HOME PARK	ORLANDO	DW	A	N	0.0150
IDEAL STORE #108	FOREST CITY	PET	A	Y	
WEKIVA FALLS RESORT	SORRENTO	DW	A	N	0.0990
CENTRAL FLORIDA BIBLE CAMP STP	EUSTIS	DW	A	N	0.0990
CAMP CHALLENGE STP	SORRENTO	DW	A	N	0.0170
LAKEVIEW TERRACE	ALTOONA	DW	A	N	0.0800
OAK SPRINGS MHP	SORRENTO	DW	A	N	0.1500
CAMP LA NO CHE	PAISLEY	DW	A	N	0.0260
CLARCONA ELEM SCHOOL	APOPKA	DW	A	N	0.0125
RIVERSIDE ELEMENTARY SCHOOL	ORLANDO	DW	A	N	
OCOEE, CITY OF	OCOEE	DW	A	N	3.0000
APOPKA WRF/PROJECT ARROW	APOPKA	DW	A	N	4.0000
CHALET NORTH MHP	APOPKA	DW	A	N	0.0950
LOST LAKE RV RESORT (FORMERLY APOPKA CLARCONA CAMPGRND)	APOPKA	DW	A	N	0.0090
AUDUBON VILLAGE MHP	ORLANDO	DW	A	N	0.0490

Table E-2 (continued)

Name	City	Facility Type	Status	NPDES	Design Cap (mgd)
Wekiva River Planning Unit (continued)					
COUNTRY RUN S/D	ORLANDO	DW	A	N	0.0429
CLARCONA RESORT CONDO	APOPKA	DW	A	N	0.0800
GROVES MHP	ORLANDO	DW	A	N	0.0700
SILVER STAR VILLAGE MHC	ORLANDO	DW	A	N	0.0550
FINFROCK INDUSTRIES PRECAST CONCRETE PRODUCTS	APOPKA	IW	A	N	
BENNETT TRUCK EQUIPMENT WASH RECYCLE SYSTEM	ORLANDO	IW	A	N	0.0000
PRO CAR CARE	ORLANDO	IW	A	N	
ROCK SPRINGS ELEM SCHOOL	APOPKA	DW	A	N	0.0050
HILLCREST MHP	ORLANDO	DW	A	N	0.0050
LAKE FAIRVIEW MANOR	ORLANDO	DW	A	N	0.0060
EUSTIS SAND COMPANY	EUSTIS, NE OF	IW	A	N	
SORRENTO(ROUND LAKE) ELEM "A"	SORRENTO	DW	A	N	0.0120
AFFORDABLE AUTOMOTIVE/CAR WASH RECYCLE SYSTEM	ORLANDO	IW	A	N	
SEMINOLE SPRINGS ELEMENTARY SCHOOL WWTF	EUSTIS	DW	A	N	0.0090
FAIRWAYS @ MT PLYMOUTH	MT PLYMOUTH	DW	A	N	0.0750
FLORIDA ROCK/CARDER ROAD CONCRETE BATCH PLANT	ORLANDO	CBP	A	Y	
KEENE ROAD LANDFILL EQUIPMENT WASH RECYCLE SYSTEM	APOPKA	IW	A	N	0.0100
OCPS/NORTHWEST TRANSPORTATION RECYCLE SYSTEM	ORLANDO	IW	A	N	0.0014
NORTRAX EQUIPMENT (NEFF TRUCK WASH)	ORLANDO	IW	A	N	
RELIABLE CONSTRUCTORS INC	SORRENTO	IW	A	N	
441 MOBILE HOME PARK	ORLANDO	DW	A	N	0.0075
SORRENTO COIN LAUNDRY	SORRENTO	IW	A	N	0.0085
EDGEWOOD CHILDRENS RANCH	ORLANDO	DW	A	N	0.0150
PARK RIDGE VILLAS	GOTHA	DW	A	N	0.0050
EWELL/WINTER GARDEN	WINTER GARDEN	CBP	A	Y	

Facility Type—

DW—Domestic wastewater

IW—Industrial wastewater

CBP—Concrete batch plant

Status—A—active

NPDES (permit)—Y=yes, N=no

Appendix F: Land Use in the Middle St. Johns Basin

Table F-1: Detailed Land Use Description for the Middle St. Johns Basin

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	72877.7156	113.8719	5.5893
1200	Residential, medium density - 2-5 dwelling units/acre	94682.0383	147.9413	7.2616
1300	Residential, high density - 6 or more dwelling units/acre	25896.4762	40.4634	1.9861
1400	Commercial and services	16612.5880	25.9573	1.2741
1460	Oil & gas storage (except areas assoc. with industrial)	151.3456	0.2365	0.0116
1480	Cemeteries	492.0448	0.7688	0.0377
1500	Industrial	7.2225	0.0113	0.0006
1510	Food processing	44.1150	0.0689	0.0034
1520	Timber processing	2.6734	0.0042	0.0002
1550	Other light industrial	4685.8683	7.3217	0.3594
1560	Other heavy industrial	273.1149	0.4267	0.0209
1600	Extractive	399.0740	0.6236	0.0306
1610	Strip mines	11.9391	0.0187	0.0009
1611	Clays	542.2223	0.8472	0.0416
1620	Sand & gravel pits (must be active)	357.5899	0.5587	0.0274
1630	Rock quarries	39.4838	0.0617	0.0030
1633	Phosphates	141.6944	0.2214	0.0109
1650	Reclaimed lands	49.4424	0.0773	0.0038
1670	Abandoned lands	81.4360	0.1272	0.0062
1700	Institutional	6412.5352	10.0196	0.4918
1730	Military	51.9947	0.0812	0.0040
1750	Governmental - (Use 1700 for city halls, courthouses, police stations, office buildings, post offices)	43.0463	0.0673	0.0033
1800	Recreational	1743.8520	2.7248	0.1337
1810	Swimming beach	6.2706	0.0098	0.0005
1820	Golf courses	4545.2436	7.1020	0.3486
1830	Race tracks	513.2186	0.8019	0.0394
1840	Marinas & fish camps	217.7332	0.3402	0.0167
1850	Parks and zoos	494.8658	0.7732	0.0380
1870	Stadiums - facilities not associated with high schools, colleges, or universities	72.9960	0.1141	0.0056
1900	Open land	4111.8683	6.4248	0.3154
1920	Inactive land with street pattern but no structures	12860.2389	20.0942	0.9863
2110	Improved pastures (monocult, planted forage crops)	47553.4914	74.3026	3.6471
2120	Unimproved pastures	6564.8150	10.2576	0.5035
2130	Woodland pastures	3232.8044	5.0513	0.2479
2140	Row crops	1614.5979	2.5228	0.1238
2150	Field crops	21477.2352	33.5583	1.6472
2160	Mixed crop - used if crop type cannot be determined	845.2329	1.3207	0.0648
2200	Tree crops	258.8196	0.4044	0.0199
2210	Citrus groves	9652.5798	15.0822	0.7403
2240	Abandoned tree crops	7176.1329	11.2128	0.5504

Table F-1 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
2310	Cattle feeding operations	246.4299	0.3850	0.0189
2320	Poultry feeding operations	265.2269	0.4144	0.0203
2400	Nurseries and vineyards	58.0239	0.0907	0.0045
2410	Tree nurseries	284.9914	0.4453	0.0219
2430	Ornamentals	3525.5959	5.5088	0.2704
2431	Shade ferns	4386.0066	6.8532	0.3364
2432	Hammock ferns	3909.8022	6.1091	0.2999
2450	Floriculture	43.9518	0.0687	0.0034
2500	Specialty farms	30.5844	0.0478	0.0023
2510	Horse farms	1978.3238	3.0911	0.1517
2540	Aquaculture	197.4683	0.3085	0.0151
2600	Other open lands - rural	37.9376	0.0593	0.0029
2610	Fallow cropland	1984.1047	3.1002	0.1522
3100	Herbaceous range	19646.9644	30.6985	1.5068
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	29454.3628	46.0226	2.2590
3300	Mixed rangeland	10952.8132	17.1138	0.8400
4110	Pine flatwoods	112819.6843	176.2815	8.6527
4120	Longleaf pine - xeric oak	12923.5893	20.1932	0.9912
4130	Sand pine	25650.7142	40.0794	1.9673
4200	Upland hardwood forests	2043.5961	3.1931	0.1567
4210	Xeric oak	3448.5905	5.3884	0.2645
4300	Upland mixed forest	24.6781	0.0386	0.0019
4340	Upland mixed coniferous/hardwood	63094.4192	98.5854	4.8390
4370	Australian pine	74.0948	0.1158	0.0057
4410	Coniferous pine	127657.7628	199.4661	9.7907
4430	Forest regeneration	72008.7195	112.5141	5.5227
5100	Streams and waterways	8517.2094	13.3082	0.6532
5200	Lakes	111552.5763	174.3016	8.5555
5300	Reservoirs - pits, retention ponds, dams	3560.0422	5.5626	0.2730
5340	Reservoirs less than 10 acres	4464.2300	6.9754	0.3424
5400	Bays and estuaries	52.7712	0.0825	0.0040
5500	Major springs	230.0620	0.3595	0.0176
5600	Slough waters	64.5568	0.1009	0.0050
6110	Bay swamp (if distinct)	9667.7778	15.1060	0.7415
6150	River/lake swamp (bottomland, may include cypress)	49532.2278	77.3944	3.7989
6170	Mixed wetland hardwoods	8372.3742	13.0819	0.6421
6180	Cabbage palm savannah	64.0000	0.1000	0.0049
6200	Wetland coniferous forests	9593.1575	14.9894	0.7357
6210	Cypress (if distinct as in domes or pure stands)	14456.1963	22.5879	1.1087
6220	Depressional pine	415.9620	0.6499	0.0319
6300	Wetland forested mixed	133546.1847	208.6668	10.2423
6410	Freshwater marshes	43856.7955	68.5265	3.3636
6430	Wet prairies	7640.3779	11.9381	0.5860
6440	Emergent aquatic vegetation	3444.6090	5.3822	0.2642

Table F-1 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
6460	Mixed scrub-shrub wetland	32357.4654	50.5587	2.4817
6500	Non-vegetated wetland	72.7221	0.1136	0.0056
7100	Beaches other than swimming beaches	9.5995	0.0150	0.0007
7200	Sand other than beaches	28.5557	0.0446	0.0022
7400	Disturbed land - use level II class. code for rural land in transition, fill areas, burned areas	564.1123	0.8814	0.0433
7410	Rural land in transition without positive indicators of intended activity	2663.2860	4.1614	0.2043
7420	Borrow areas - associated with nearby fill areas for construction	130.6564	0.2042	0.0100
7430	Spoil areas	408.5640	0.6384	0.0313
8110	Airports	1959.5710	3.0618	0.1503
8120	Railroads	113.3591	0.1771	0.0087
8140	Roads and highways (divided 4-lanes with medians)	6442.2046	10.0660	0.4941
8180	Auto parking facilities	7.4095	0.0116	0.0006
8191	Highways	128.3066	0.2005	0.0098
8200	Communications	338.6075	0.5291	0.0260
8310	Electrical power facilities	673.8725	1.0529	0.0517
8320	Electrical power transmission lines	3230.8398	5.0482	0.2478
8330	Water supply plants	178.2430	0.2785	0.0137
8340	Sewage treatment	811.9532	1.2687	0.0623
8350	Solid waste disposal	1171.9962	1.8313	0.0899

Table F-2: Alexander Springs Planning Unit Detailed Land Use Description

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	652.3640	1.0193	1.0199
1200	Residential, medium density - 2-5 dwelling units/acre	753.7234	1.1777	1.1783
1300	Residential, high density - 6 or more dwelling units/acre	28.1111	0.0439	0.0439
1400	Commercial and services	10.7946	0.0169	0.0169
1550	Other light industrial	79.4038	0.1241	0.1241
1700	Institutional	14.5032	0.0227	0.0227
1800	Recreational	106.9412	0.1671	0.1672
1840	Marinas & fish camps	9.3661	0.0146	0.0146
1920	Inactive land with street pattern but no structures	42.8799	0.0670	0.0670
2110	Improved pastures (monocult, planted forage crops)	196.3184	0.3067	0.3069
2130	Woodland pastures	4.1731	0.0065	0.0065
2150	Field crops	211.4658	0.3304	0.3306
2210	Citrus groves	20.9307	0.0327	0.0327
2240	Abandoned tree crops	53.7824	0.0840	0.0841
2310	Cattle feeding operations	155.3405	0.2427	0.2429
2431	Shade ferns	10.9430	0.0171	0.0171
3100	Herbaceous range	48.9748	0.0765	0.0766
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	367.5242	0.5743	0.5746
3300	Mixed rangeland	66.2928	0.1036	0.1036
4110	Pine flatwoods	6531.9979	10.2063	10.2118
4120	Longleaf pine - xeric oak	679.2909	1.0614	1.0620
4130	Sand pine	8798.5475	13.7478	13.7553
4200	Upland hardwood forests	10.3933	0.0162	0.0162
4340	Upland mixed coniferous/hardwood	1649.7339	2.5777	2.5791
4410	Coniferous pine	18997.2602	29.6833	29.6995
4430	Forest regeneration	12954.3052	20.2412	20.2522
5100	Streams and waterways	114.0392	0.1782	0.1783
5200	Lakes	2200.4274	3.4382	3.4400
5340	Reservoirs less than 10 acres	13.2481	0.0207	0.0207
5500	Major springs	2.2712	0.0035	0.0036
6110	Bay swamp (if distinct)	727.6272	1.1369	1.1375
6150	River/lake swamp (bottomland, may include cypress)	1267.9501	1.9812	1.9823
6170	Mixed wetland hardwoods	749.6276	1.1713	1.1719
6200	Wetland coniferous forests	458.5990	0.7166	0.7170
6210	Cypress (if distinct as in domes or pure stands)	1.6326	0.0026	0.0026
6220	Depressional pine	26.5983	0.0416	0.0416
6300	Wetland forested mixed	3700.2068	5.7816	5.7847
6410	Freshwater marshes	1029.2603	1.6082	1.6091
6430	Wet prairies	279.9078	0.4374	0.4376
6440	Emergent aquatic vegetation	84.4227	0.1319	0.1320
6460	Mixed scrub-shrub wetland	425.0083	0.6641	0.6644
6500	Non-vegetated wetland	37.4836	0.0586	0.0586
7400	Disturbed land - use level II class. code for rural land in transition, fill areas, burned areas	253.7238	0.3964	0.3967
7410	Rural land in transition without positive indicators of intended activity	5.7513	0.0090	0.0090
8320	Electrical power transmission lines	131.8632	0.2060	0.2061

Table F-3: Deep Creek Planning Unit Detailed Land Use Descriptions

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	10084.9587	15.7578	5.7478
1200	Residential, medium density - 2-5 dwelling units/acre	2033.5822	3.1775	1.1590
1300	Residential, high density - 6 or more dwelling units/acre	150.8209	0.2357	0.0860
1400	Commercial and services	98.0800	0.1533	0.0559
1480	Cemeteries	5.4112	0.0085	0.0031
1510	Food processing	9.9911	0.0156	0.0057
1550	Other light industrial	32.7247	0.0511	0.0187
1600	Extractive	54.2357	0.0847	0.0309
1620	Sand & gravel pits (must be active)	17.8979	0.0280	0.0102
1700	Institutional	127.6290	0.1994	0.0727
1750	Governmental - (Use 1700 for city halls, courthouses, police stations, office buildings, post offices)	15.5158	0.0242	0.0088
1800	Recreational	18.9715	0.0296	0.0108
1820	Golf courses	27.4231	0.0428	0.0156
1900	Open land	48.2252	0.0754	0.0275
1920	Inactive land with street pattern but no structures	835.1882	1.3050	0.4760
2110	Improved pastures (monocult, planted forage crops)	5003.7784	7.8184	2.8519
2120	Unimproved pastures	1666.0401	2.6032	0.9495
2130	Woodland pastures	350.6298	0.5479	0.1998
2140	Row crops	400.0164	0.6250	0.2280
2150	Field crops	5036.8803	7.8702	2.8707
2160	Mixed crop - used if crop type cannot be determined	759.5329	1.1868	0.4329
2210	Citrus groves	597.0834	0.9329	0.3403
2240	Abandoned tree crops	643.2028	1.0050	0.3666
2320	Poultry feeding operations	113.7709	0.1778	0.0648
2410	Tree nurseries	39.3246	0.0614	0.0224
2430	Ornamentals	88.8170	0.1388	0.0506
2432	Hammock ferns	2.3816	0.0037	0.0014
2500	Specialty farms	8.9887	0.0140	0.0051
2510	Horse farms	11.7315	0.0183	0.0067
2540	Aquaculture	3.2481	0.0051	0.0019
2610	Fallow cropland	847.6911	1.3245	0.4831
3100	Herbaceous range	1632.4618	2.5507	0.9304
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	7001.7724	10.9403	3.9906
3300	Mixed rangeland	1887.4106	2.9491	1.0757
4110	Pine flatwoods	25707.4009	40.1680	14.6517
4120	Longleaf pine - xeric oak	228.1857	0.3565	0.1301
4130	Sand pine	217.9064	0.3405	0.1242
4200	Upland hardwood forests	37.2169	0.0582	0.0212
4210	Xeric oak	119.9720	0.1875	0.0684
4340	Upland mixed coniferous/hardwood	5648.3127	8.8255	3.2192
4370	Australian pine	74.0948	0.1158	0.0422
4410	Coniferous pine	18204.4256	28.4445	10.3754
4430	Forest regeneration	8665.8686	13.5405	4.9390

Table F-3 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
5100	Streams and waterways	912.8483	1.4263	0.5203
5200	Lakes	9786.0003	15.2907	5.5774
5300	Reservoirs - pits, retention ponds, dams	310.2484	0.4848	0.1768
5340	Reservoirs less than 10 acres	314.2104	0.4910	0.1791
5600	Slough waters	57.5077	0.0899	0.0328
6110	Bay swamp (if distinct)	305.8508	0.4779	0.1743
6150	River/lake swamp (bottomland, may include cypress)	410.0881	0.6408	0.2337
6170	Mixed wetland hardwoods	1671.7817	2.6122	0.9528
6180	Cabbage palm savannah	64.0000	0.1000	0.0365
6200	Wetland coniferous forests	3240.9840	5.0641	1.8472
6210	Cypress (if distinct as in domes or pure stands)	7221.8779	11.2842	4.1160
6220	Depressional pine	30.9848	0.0484	0.0177
6300	Wetland forested mixed	31142.5477	48.6604	17.7494
6410	Freshwater marshes	5984.6929	9.3511	3.4109
6430	Wet prairies	1939.7629	3.0309	1.1055
6440	Emergent aquatic vegetation	377.5002	0.5898	0.2152
6460	Mixed scrub-shrub wetland	11194.8353	17.4920	6.3804
6500	Non-vegetated wetland	18.3775	0.0287	0.0105
7100	Beaches other than swimming beaches	7.9789	0.0125	0.0045
7200	Sand other than beaches	18.9571	0.0296	0.0108
7400	Disturbed land - use level II class. code for rural land in transition, fill areas, burned areas	2.6038	0.0041	0.0015
7410	Rural land in transition without positive indicators of intended activity	65.5872	0.1025	0.0374
7420	Borrow areas - associated with nearby fill areas for construction	62.2666	0.0973	0.0355
7430	Spoil areas	52.2562	0.0817	0.0298
8140	Roads and highways (divided 4-lanes with medians)	239.4235	0.3741	0.1365
8200	Communications	0.9230	0.0014	0.0005
8320	Electrical power transmission lines	970.6669	1.5167	0.5532
8330	Water supply plants	1.9653	0.0031	0.0011
8350	Solid waste disposal	491.7110	0.7683	0.2802

Table F-4: Econlockhatchee Planning Unit Detailed Land Use Description

LEVEL3	ATTRIBUTE	ACRES	SQ_MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	8247.1600	12.8862	4.7644
1200	Residential, medium density - 2-5 dwelling units/acre	11276.1509	17.6191	6.5142
1300	Residential, high density - 6 or more dwelling units/acre	11354.4324	17.7414	6.5594
1400	Commercial and services	2881.5882	4.5025	1.6647
1460	Oil & gas storage (except areas assoc. with industrial)	32.4558	0.0507	0.0187
1480	Cemeteries	110.8570	0.1732	0.0640
1550	Other light industrial	726.0960	1.1345	0.4195
1560	Other heavy industrial	87.2080	0.1363	0.0504
1600	Extractive	36.0292	0.0563	0.0208
1620	Sand & gravel pits (must be active)	144.1323	0.2252	0.0833
1700	Institutional	1720.5849	2.6884	0.9940
1730	Military	51.9947	0.0812	0.0300
1800	Recreational	182.4759	0.2851	0.1054
1820	Golf courses	1188.3891	1.8569	0.6865
1830	Race tracks	172.5964	0.2697	0.0997
1850	Parks and zoos	106.5700	0.1665	0.0616
1900	Open land	107.9668	0.1687	0.0624
1920	Inactive land with street pattern but no structures	4844.5429	7.5696	2.7987
2110	Improved pastures (monocult, planted forage crops)	12011.8746	18.7686	6.9392
2120	Unimproved pastures	2383.0782	3.7236	1.3767
2130	Woodland pastures	451.3745	0.7053	0.2608
2150	Field crops	4346.0707	6.7908	2.5107
2160	Mixed crop - used if crop type cannot be determined	8.6892	0.0136	0.0050
2200	Tree crops	5.4835	0.0086	0.0032
2210	Citrus groves	2257.8411	3.5279	1.3044
2240	Abandoned tree crops	205.8938	0.3217	0.1189
2310	Cattle feeding operations	14.9428	0.0233	0.0086
2320	Poultry feeding operations	3.9140	0.0061	0.0023
2400	Nurseries and vineyards	8.9597	0.0140	0.0052
2410	Tree nurseries	69.9311	0.1093	0.0404
2430	Ornamentals	67.3122	0.1052	0.0389
2510	Horse farms	59.1534	0.0924	0.0342
2600	Other open lands - rural	4.8857	0.0076	0.0028
2610	Fallow cropland	104.4343	0.1632	0.0603
3100	Herbaceous range	6896.8865	10.7764	3.9843
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	9048.9423	14.1390	5.2276
3300	Mixed rangeland	2013.5990	3.1463	1.1633
4110	Pine flatwoods	26180.8054	40.9077	15.1246
4120	Longleaf pine - xeric oak	59.6872	0.0933	0.0345
4200	Upland hardwood forests	17.2208	0.0269	0.0099
4210	Xeric oak	256.1974	0.4003	0.1480
4340	Upland mixed coniferous/hardwood	5056.7270	7.9012	2.9213
4410	Coniferous pine	300.6978	0.4698	0.1737
4430	Forest regeneration	1059.2259	1.6550	0.6119

Table F-4 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
5100	Streams and waterways	404.5774	0.6322	0.2337
5200	Lakes	3139.6569	4.9057	1.8138
5300	Reservoirs - pits, retention ponds, dams	992.1724	1.5503	0.5732
5340	Reservoirs less than 10 acres	1772.6723	2.7698	1.0241
6110	Bay swamp (if distinct)	855.2001	1.3363	0.4940
6150	River/lake swamp (bottomland, may include cypress)	647.4644	1.0117	0.3740
6170	Mixed wetland hardwoods	439.4970	0.6867	0.2539
6200	Wetland coniferous forests	1847.6345	2.8869	1.0674
6210	Cypress (if distinct as in domes or pure stands)	5842.3494	9.1287	3.3751
6220	Depressional pine	16.1264	0.0252	0.0093
6300	Wetland forested mixed	26012.5248	40.6447	15.0274
6410	Freshwater marshes	4268.9463	6.6703	2.4662
6430	Wet prairies	1123.3929	1.7553	0.6490
6440	Emergent aquatic vegetation	167.2414	0.2613	0.0966
6460	Mixed scrub-shrub wetland	3897.1973	6.0894	2.2514
6500	Non-vegetated wetland	0.0804	0.0001	0.0000
7400	Disturbed land - use level II class. code for rural land in transition, fill areas, burned areas	219.5017	0.3430	0.1268
7410	Rural land in transition without positive indicators of intended activity	398.6677	0.6229	0.2303
7430	Spoil areas	109.5018	0.1711	0.0633
8110	Airports	480.6401	0.7510	0.2777
8140	Roads and highways (divided 4-lanes with medians)	1988.4577	3.1070	1.1487
8200	Communications	28.3035	0.0442	0.0164
8310	Electrical power facilities	410.3423	0.6412	0.2371
8320	Electrical power transmission lines	789.0474	1.2329	0.4558
8330	Water supply plants	42.7639	0.0668	0.0247
8340	Sewage treatment	367.7087	0.5745	0.2124
8350	Solid waste disposal	673.8215	1.0529	0.3893

Table F-5: Lake George Planning Unit Detailed Land Use Descriptions

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	7417.5375	11.5899	4.6003
1200	Residential, medium density - 2-5 dwelling units/acre	1608.0079	2.5125	0.9973
1300	Residential, high density - 6 or more dwelling units/acre	62.6668	0.0979	0.0389
1400	Commercial and services	150.6452	0.2354	0.0934
1480	Cemeteries	3.2698	0.0051	0.0020
1550	Other light industrial	34.7253	0.0543	0.0215
1600	Extractive	6.8490	0.0107	0.0042
1611	Clays	44.9919	0.0703	0.0279
1620	Sand & gravel pits (must be active)	48.1734	0.0753	0.0299
1700	Institutional	99.2902	0.1551	0.0616
1800	Recreational	27.9576	0.0437	0.0173
1820	Golf courses	39.7561	0.0621	0.0247
1840	Marinas & fish camps	10.1144	0.0158	0.0063
1900	Open land	266.7150	0.4167	0.1654
1920	Inactive land with street pattern but no structures	1681.0129	2.6266	1.0425
2110	Improved pastures (monocult, planted forage crops)	3180.5942	4.9697	1.9726
2120	Unimproved pastures	92.3581	0.1443	0.0573
2130	Woodland pastures	207.8776	0.3248	0.1289
2140	Row crops	180.5384	0.2821	0.1120
2150	Field crops	600.2999	0.9380	0.3723
2200	Tree crops	40.8216	0.0638	0.0253
2210	Citrus groves	305.3622	0.4771	0.1894
2240	Abandoned tree crops	371.7674	0.5809	0.2306
2410	Tree nurseries	13.1525	0.0206	0.0082
2430	Ornamentals	33.2850	0.0520	0.0206
2431	Shade ferns	1609.0094	2.5141	0.9979
2432	Hammock ferns	1778.4380	2.7788	1.1030
2450	Floriculture	2.5824	0.0040	0.0016
2510	Horse farms	109.4212	0.1710	0.0679
2540	Aquaculture	149.4300	0.2335	0.0927
2610	Fallow cropland	37.9160	0.0592	0.0235
3100	Herbaceous range	1046.3656	1.6350	0.6489
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	1660.5234	2.5946	1.0298
3300	Mixed rangeland	728.0120	1.1375	0.4515
4110	Pine flatwoods	11099.7933	17.3435	6.8840
4120	Longleaf pine - xeric oak	3827.7986	5.9810	2.3740
4130	Sand pine	255.2626	0.3988	0.1583
4200	Upland hardwood forests	143.1293	0.2236	0.0888
4210	Xeric oak	258.6432	0.4041	0.1604
4340	Upland mixed coniferous/hardwood	6735.8186	10.5248	4.1775
4410	Coniferous pine	19298.8544	30.1546	11.9689
4430	Forest regeneration	8000.8593	12.5014	4.9620

Table F-5 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
5100	Streams and waterways	3574.9378	5.5859	2.2171
5200	Lakes	48951.1861	76.4865	30.3590
5300	Reservoirs - pits, retention ponds, dams	46.3739	0.0725	0.0288
5340	Reservoirs less than 10 acres	104.0691	0.1626	0.0645
5400	Bays and estuaries	47.3458	0.0740	0.0294
5500	Major springs	21.8882	0.0342	0.0136
6110	Bay swamp (if distinct)	1749.0484	2.7329	1.0847
6150	River/lake swamp (bottomland, may include cypress)	7549.0045	11.7954	4.6818
6170	Mixed wetland hardwoods	315.8797	0.4936	0.1959
6200	Wetland coniferous forests	1484.8298	2.3201	0.9209
6210	Cypress (if distinct as in domes or pure stands)	107.3946	0.1678	0.0666
6220	Depressional pine	62.8699	0.0982	0.0390
6300	Wetland forested mixed	17879.8971	27.9375	11.0889
6410	Freshwater marshes	2566.7417	4.0106	1.5919
6430	Wet prairies	191.2934	0.2989	0.1186
6440	Emergent aquatic vegetation	263.2744	0.4114	0.1633
6460	Mixed scrub-shrub wetland	2585.8929	4.0405	1.6037
6500	Non-vegetated wetland	0.8862	0.0014	0.0005
7200	Sand other than beaches	2.7308	0.0043	0.0017
7410	Rural land in transition without positive indicators of intended activity	310.4467	0.4851	0.1925
7420	Borrow areas - associated with nearby fill areas for construction	3.6582	0.0057	0.0023
7430	Spoil areas	25.5174	0.0399	0.0158
8110	Airports	66.5994	0.1041	0.0413
8310	Electrical power facilities	6.7793	0.0106	0.0042
8320	Electrical power transmission lines	50.8172	0.0794	0.0315
8340	Sewage treatment	2.2926	0.0036	0.0014

Table F-6: Lake Jesup Planning Unit Detailed Land Use Descriptions

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	6758.6299	10.5604	7.2851
1200	Residential, medium density - 2-5 dwelling units/acre	19375.9410	30.2750	20.8851
1300	Residential, high density - 6 or more dwelling units/acre	5764.0842	9.0064	6.2130
1400	Commercial and services	4876.6144	7.6197	5.2565
1480	Cemeteries	94.2250	0.1472	0.1016
1500	Industrial	7.2225	0.0113	0.0078
1510	Food processing	1.9971	0.0031	0.0022
1520	Timber processing	2.6734	0.0042	0.0029
1550	Other light industrial	1141.6768	1.7839	1.2306
1600	Extractive	37.4705	0.0585	0.0404
1620	Sand & gravel pits (must be active)	30.8771	0.0482	0.0333
1700	Institutional	1416.4844	2.2133	1.5268
1800	Recreational	356.8968	0.5577	0.3847
1820	Golf courses	720.6356	1.1260	0.7768
1830	Race tracks	187.0905	0.2923	0.2017
1850	Parks and zoos	129.1772	0.2018	0.1392
1870	Stadiums - facilities not associated with high schools, colleges, or universities	56.1372	0.0877	0.0605
1900	Open land	583.0003	0.9109	0.6284
1920	Inactive land with street pattern but no structures	511.0079	0.7985	0.5508
2110	Improved pastures (monocult, planted forage crops)	1058.1132	1.6533	1.1405
2120	Unimproved pastures	117.1558	0.1831	0.1263
2130	Woodland pastures	509.8159	0.7966	0.5495
2140	Row crops	449.6934	0.7026	0.4847
2150	Field crops	2080.8191	3.2513	2.2429
2160	Mixed crop - used if crop type cannot be determined	58.1346	0.0908	0.0627
2210	Citrus groves	1772.8247	2.7700	1.9109
2240	Abandoned tree crops	392.1410	0.6127	0.4227
2320	Poultry feeding operations	8.2587	0.0129	0.0089
2400	Nurseries and vineyards	6.0027	0.0094	0.0065
2410	Tree nurseries	40.1800	0.0628	0.0433
2430	Ornamentals	132.2833	0.2067	0.1426
2450	Floriculture	21.7707	0.0340	0.0235
2510	Horse farms	118.9680	0.1859	0.1282
2540	Aquaculture	31.0422	0.0485	0.0335
2610	Fallow cropland	453.0199	0.7078	0.4883
3100	Herbaceous range	834.4610	1.3039	0.8995
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	707.2963	1.1052	0.7624
3300	Mixed rangeland	488.5421	0.7634	0.5266
4110	Pine flatwoods	1786.5321	2.7915	1.9257
4120	Longleaf pine - xeric oak	3.7221	0.0058	0.0040
4200	Upland hardwood forests	2.7383	0.0043	0.0030
4210	Xeric oak	46.9470	0.0734	0.0506
4340	Upland mixed coniferous/hardwood	4430.5611	6.9228	4.7757
4410	Coniferous pine	118.3527	0.1849	0.1276
4430	Forest regeneration	59.4467	0.0929	0.0641

Table F-6 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
5100	Streams and waterways	9.9350	0.0155	0.0107
5200	Lakes	12385.8630	19.3530	13.3506
5300	Reservoirs - pits, retention ponds, dams	224.6169	0.3510	0.2421
5340	Reservoirs less than 10 acres	858.7784	1.3418	0.9257
6110	Bay swamp (if distinct)	61.9931	0.0969	0.0668
6150	River/lake swamp (bottomland, may include cypress)	1357.6236	2.1213	1.4634
6170	Mixed wetland hardwoods	1497.2166	2.3394	1.6138
6200	Wetland coniferous forests	258.7489	0.4043	0.2789
6210	Cypress (if distinct as in domes or pure stands)	1.6121	0.0025	0.0017
6220	Depressional pine	5.9988	0.0094	0.0065
6300	Wetland forested mixed	8816.8720	13.7764	9.5036
6410	Freshwater marshes	4341.6195	6.7838	4.6798
6430	Wet prairies	609.9488	0.9530	0.6575
6440	Emergent aquatic vegetation	148.5423	0.2321	0.1601
6460	Mixed scrub-shrub wetland	1032.9740	1.6140	1.1134
7400	Disturbed land - use level II class. code for rural land in transition, fill areas, burned areas	21.4580	0.0335	0.0231
7410	Rural land in transition without positive indicators of intended activity	254.8628	0.3982	0.2747
7430	Spoil areas	28.4553	0.0445	0.0307
8110	Airports	990.2868	1.5473	1.0674
8140	Roads and highways (divided 4-lanes with medians)	1463.1585	2.2862	1.5771
8191	Highways	115.1136	0.1799	0.1241
8200	Communications	1.3709	0.0021	0.0015
8310	Electrical power facilities	41.5784	0.0650	0.0448
8320	Electrical power transmission lines	252.2523	0.3941	0.2719
8330	Water supply plants	42.9187	0.0671	0.0463
8340	Sewage treatment	162.9178	0.2546	0.1756
8350	Solid waste disposal	6.4636	0.0101	0.0070

Table F-7: Lake Kerr Planning Unit Detailed Land Use Descriptions

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	1175.7377	1.8371	0.9758
1200	Residential, medium density - 2-5 dwelling units/acre	867.8767	1.3561	0.7203
1400	Commercial and services	18.1297	0.0283	0.0150
1550	Other light industrial	2.4316	0.0038	0.0020
1611	Clays	41.8595	0.0654	0.0347
1700	Institutional	18.7698	0.0293	0.0156
1750	Governmental - (Use 1700 for city halls, courthouses, police stations, office buildings, post offices)	8.3967	0.0131	0.0070
1800	Recreational	71.9970	0.1125	0.0598
1810	Swimming beach	6.2706	0.0098	0.0052
1840	Marinas & fish camps	31.4252	0.0491	0.0261
2120	Unimproved pastures	17.2967	0.0270	0.0144
2130	Woodland pastures	71.7595	0.1121	0.0596
2160	Mixed crop - used if crop type cannot be determined	18.8761	0.0295	0.0157
2200	Tree crops	47.4934	0.0742	0.0394
3100	Herbaceous range	49.1240	0.0768	0.0408
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	459.9122	0.7186	0.3817
3300	Mixed rangeland	64.5662	0.1009	0.0536
4110	Pine flatwoods	13718.3666	21.4350	11.3855
4120	Longleaf pine - xeric oak	922.5207	1.4414	0.7656
4130	Sand pine	15.1432	0.0237	0.0126
4200	Upland hardwood forests	1122.7773	1.7543	0.9318
4340	Upland mixed coniferous/hardwood	8254.4299	12.8976	6.8507
4410	Coniferous pine	51300.6091	80.1575	42.5768
4430	Forest regeneration	26703.8673	41.7250	22.1628
5100	Streams and waterways	51.4511	0.0804	0.0427
5200	Lakes	4226.3989	6.6038	3.5077
5340	Reservoirs less than 10 acres	5.4384	0.0085	0.0045
5500	Major springs	205.9027	0.3217	0.1709
6110	Bay swamp (if distinct)	442.6347	0.6916	0.3674
6150	River/lake swamp (bottomland, may include cypress)	404.4717	0.6320	0.3357
6200	Wetland coniferous forests	310.9615	0.4859	0.2581
6220	Depressional pine	84.7254	0.1324	0.0703
6300	Wetland forested mixed	4985.8836	7.7905	4.1380
6410	Freshwater marshes	2240.8585	3.5014	1.8598
6430	Wet prairies	698.7199	1.0918	0.5799
6440	Emergent aquatic vegetation	193.3502	0.3021	0.1605
6460	Mixed scrub-shrub wetland	1575.1223	2.4611	1.3073
7100	Beaches other than swimming beaches	1.6207	0.0025	0.0013
7410	Rural land in transition without positive indicators of intended activity	1.8567	0.0029	0.0015
8200	Communications	2.4802	0.0039	0.0021
8310	Electrical power facilities	1.7679	0.0028	0.0015
8320	Electrical power transmission lines	46.3827	0.0725	0.0385

Table F-8: Lake Monroe Planning Unit Detailed Land Use Descriptions

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	7057.0037	11.0266	7.9333
1200	Residential, medium density - 2-5 dwelling units/acre	18557.8326	28.9967	20.8623
1300	Residential, high density - 6 or more dwelling units/acre	1612.2017	2.5191	1.8124
1400	Commercial and services	1308.6500	2.0448	1.4712
1460	Oil & gas storage (except areas assoc. with industrial)	2.4120	0.0038	0.0027
1480	Cemeteries	68.0406	0.1063	0.0765
1550	Other light industrial	521.1484	0.8143	0.5859
1600	Extractive	72.6937	0.1136	0.0817
1620	Sand & gravel pits (must be active)	61.7315	0.0965	0.0694
1630	Rock quarries	39.4838	0.0617	0.0444
1650	Reclaimed lands	37.7540	0.0590	0.0424
1700	Institutional	787.1978	1.2300	0.8849
1750	Governmental - (Use 1700 for city halls, courthouses, police stations, office buildings, post offices)	19.1339	0.0299	0.0215
1800	Recreational	143.9809	0.2250	0.1619
1820	Golf courses	603.6631	0.9432	0.6786
1840	Marinas & fish camps	67.6843	0.1058	0.0761
1850	Parks and zoos	46.4495	0.0726	0.0522
1900	Open land	252.4885	0.3945	0.2838
1920	Inactive land with street pattern but no structures	741.0709	1.1579	0.8331
2110	Improved pastures (monocult, planted forage crops)	1991.4793	3.1117	2.2388
2120	Unimproved pastures	245.2978	0.3833	0.2758
2130	Woodland pastures	196.9074	0.3077	0.2214
2140	Row crops	410.2557	0.6410	0.4612
2150	Field crops	2363.3404	3.6927	2.6568
2210	Citrus groves	337.8690	0.5279	0.3798
2240	Abandoned tree crops	745.4523	1.1648	0.8380
2310	Cattle feeding operations	8.2543	0.0129	0.0093
2320	Poultry feeding operations	32.3820	0.0506	0.0364
2410	Tree nurseries	35.4499	0.0554	0.0399
2430	Ornamentals	98.8599	0.1545	0.1111
2450	Floriculture	4.0711	0.0064	0.0046
2510	Horse farms	68.7589	0.1074	0.0773
2610	Fallow cropland	63.2408	0.0988	0.0711
3100	Herbaceous range	1012.3037	1.5817	1.1380
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	1565.9833	2.4469	1.7604
3300	Mixed rangeland	331.3434	0.5177	0.3725
4110	Pine flatwoods	1951.3665	3.0490	2.1937
4120	Longleaf pine - xeric oak	213.8956	0.3342	0.2405
4130	Sand pine	3328.9766	5.2015	3.7424
4200	Upland hardwood forests	3.5648	0.0056	0.0040
4340	Upland mixed coniferous/hardwood	6726.2400	10.5098	7.5615
4410	Coniferous pine	305.6054	0.4775	0.3436
4430	Forest regeneration	117.4821	0.1836	0.1321

Table F-8 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
5100	Streams and waterways	957.4404	1.4960	1.0763
5200	Lakes	12799.4353	19.9992	14.3888
5300	Reservoirs - pits, retention ponds, dams	1320.6589	2.0635	1.4847
5340	Reservoirs less than 10 acres	254.0297	0.3969	0.2856
5600	Slough waters	7.0491	0.0110	0.0079
6110	Bay swamp (if distinct)	33.2605	0.0520	0.0374
6150	River/lake swamp (bottomland, may include cypress)	445.8621	0.6967	0.5012
6170	Mixed wetland hardwoods	119.2943	0.1864	0.1341
6200	Wetland coniferous forests	377.9965	0.5906	0.4249
6210	Cypress (if distinct as in domes or pure stands)	592.4253	0.9257	0.6660
6220	Depressional pine	9.8060	0.0153	0.0110
6300	Wetland forested mixed	5822.0716	9.0970	6.5450
6410	Freshwater marshes	5923.9749	9.2562	6.6596
6430	Wet prairies	1058.5323	1.6540	1.1900
6440	Emergent aquatic vegetation	398.8291	0.6232	0.4484
6460	Mixed scrub-shrub wetland	2467.1348	3.8549	2.7735
7400	Disturbed land - use level II class. code for rural land in transition, fill areas, burned areas	65.3286	0.1021	0.0734
7410	Rural land in transition without positive indicators of intended activity	347.4377	0.5429	0.3906
7430	Spoil areas	170.7230	0.2668	0.1919
8110	Airports	386.1601	0.6034	0.4341
8120	Railroads	113.3591	0.1771	0.1274
8140	Roads and highways (divided 4-lanes with medians)	605.9905	0.9469	0.6812
8191	Highways	13.1931	0.0206	0.0148
8310	Electrical power facilities	131.7346	0.2058	0.1481
8320	Electrical power transmission lines	326.5232	0.5102	0.3671
8330	Water supply plants	13.1622	0.0206	0.0148
8340	Sewage treatment	33.6063	0.0525	0.0378

Table F-9: Lake Woodruff Planning Unit Detailed Land Use Descriptions

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	12188.9794	19.0454	6.8889
1200	Residential, medium density - 2-5 dwelling units/acre	10699.3613	16.7178	6.0470
1300	Residential, high density - 6 or more dwelling units/acre	942.1243	1.4721	0.5325
1400	Commercial and services	1669.0077	2.6078	0.9433
1460	Oil & gas storage (except areas assoc. with industrial)	76.4677	0.1195	0.0432
1480	Cemeteries	86.4010	0.1350	0.0488
1550	Other light industrial	129.7121	0.2027	0.0733
1600	Extractive	144.5676	0.2259	0.0817
1610	Strip mines	1.9188	0.0030	0.0011
1611	Clays	213.7233	0.3339	0.1208
1650	Reclaimed lands	11.6884	0.0183	0.0066
1670	Abandoned lands	10.9799	0.0172	0.0062
1700	Institutional	550.1643	0.8596	0.3109
1800	Recreational	125.8462	0.1966	0.0711
1820	Golf courses	507.4963	0.7930	0.2868
1830	Race tracks	58.0013	0.0906	0.0328
1840	Marinas & fish camps	93.3160	0.1458	0.0527
1850	Parks and zoos	32.2355	0.0504	0.0182
1870	Stadiums - facilities not associated with high schools, colleges, or universities	16.8588	0.0263	0.0095
1900	Open land	391.9143	0.6124	0.2215
1920	Inactive land with street pattern but no structures	736.5348	1.1508	0.4163
2110	Improved pastures (monocult, planted forage crops)	6119.6580	9.5620	3.4587
2120	Unimproved pastures	393.5930	0.6150	0.2224
2130	Woodland pastures	739.5810	1.1556	0.4180
2140	Row crops	157.5198	0.2461	0.0890
2150	Field crops	1630.6707	2.5479	0.9216
2210	Citrus groves	1190.0399	1.8594	0.6726
2240	Abandoned tree crops	893.1746	1.3956	0.5048
2310	Cattle feeding operations	15.3919	0.0240	0.0087
2320	Poultry feeding operations	14.5337	0.0227	0.0082
2400	Nurseries and vineyards	8.9926	0.0141	0.0051
2410	Tree nurseries	9.6616	0.0151	0.0055
2430	Ornamentals	89.3357	0.1396	0.0505
2431	Shade ferns	2489.1716	3.8893	1.4068
2432	Hammock ferns	2039.6044	3.1869	1.1527
2510	Horse farms	604.2525	0.9441	0.3415
2600	Other open lands - rural	21.8591	0.0342	0.0124
2610	Fallow cropland	118.0897	0.1845	0.0667
3100	Herbaceous range	1049.4991	1.6398	0.5931
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	2855.3056	4.4614	1.6137
3300	Mixed rangeland	593.0993	0.9267	0.3352

Table F-9 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
4110	Pine flatwoods	11159.1873	17.4363	6.3068
4120	Longleaf pine - xeric oak	5105.4471	7.9773	2.8854
4130	Sand pine	4433.6818	6.9277	2.5058
4200	Upland hardwood forests	291.1314	0.4549	0.1645
4210	Xeric oak	1260.2603	1.9692	0.7123
4300	Upland mixed forest	24.6781	0.0386	0.0139
4340	Upland mixed coniferous/hardwood	10089.1462	15.7644	5.7021
4410	Coniferous pine	12998.4290	20.3101	7.3463
4430	Forest regeneration	7210.0386	11.2657	4.0749
5100	Streams and waterways	2228.8043	3.4825	1.2597
5200	Lakes	7791.8984	12.1749	4.4038
5300	Reservoirs - pits, retention ponds, dams	299.3869	0.4678	0.1692
5340	Reservoirs less than 10 acres	212.1024	0.3314	0.1199
5400	Bays and estuaries	5.4254	0.0085	0.0031
6110	Bay swamp (if distinct)	1323.8808	2.0686	0.7482
6150	River/lake swamp (bottomland, may include cypress)	19812.6218	30.9573	11.1975
6170	Mixed wetland hardwoods	2658.3701	4.1537	1.5024
6200	Wetland coniferous forests	980.4538	1.5320	0.5541
6210	Cypress (if distinct as in domes or pure stands)	586.6014	0.9166	0.3315
6220	Depressional pine	82.4416	0.1288	0.0466
6300	Wetland forested mixed	17699.7051	27.6559	10.0034
6410	Freshwater marshes	12860.4868	20.0946	7.2684
6430	Wet prairies	599.3147	0.9364	0.3387
6440	Emergent aquatic vegetation	937.2624	1.4645	0.5297
6460	Mixed scrub-shrub wetland	5184.5618	8.1009	2.9302
6500	Non-vegetated wetland	13.0259	0.0204	0.0074
7200	Sand other than beaches	3.5691	0.0056	0.0020
7410	Rural land in transition without positive indicators of intended activity	184.4791	0.2882	0.1043
7430	Spoil areas	7.3839	0.0115	0.0042
8110	Airports	12.2454	0.0191	0.0069
8140	Roads and highways (divided 4-lanes with medians)	407.1438	0.6362	0.2301
8200	Communications	225.9599	0.3531	0.1277
8310	Electrical power facilities	35.1738	0.0550	0.0199
8320	Electrical power transmission lines	435.1544	0.6799	0.2459
8330	Water supply plants	4.9269	0.0077	0.0028
8340	Sewage treatment	52.9679	0.0828	0.0299

Table F-10: Wekiva River Planning Unit Detailed Land Use Descriptions

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
1100	Residential, low density - less than 2 dwelling units/acre	19295.3447	30.1491	7.6889
1200	Residential, medium density - 2-5 dwelling units/acre	29509.5623	46.1089	11.7592
1300	Residential, high density - 6 or more dwelling units/acre	5982.0349	9.3470	2.3838
1400	Commercial and services	5599.0783	8.7486	2.2312
1460	Oil & gas storage (except areas assoc. with industrial)	40.0101	0.0625	0.0159
1480	Cemeteries	123.8403	0.1935	0.0493
1510	Food processing	32.1268	0.0502	0.0128
1550	Other light industrial	2017.9496	3.1531	0.8041
1560	Other heavy industrial	185.9069	0.2905	0.0741
1600	Extractive	47.2283	0.0738	0.0188
1610	Strip mines	10.0204	0.0157	0.0040
1611	Clays	241.6475	0.3776	0.0963
1620	Sand & gravel pits (must be active)	54.7777	0.0856	0.0218
1633	Phosphates	141.6944	0.2214	0.0565
1670	Abandoned lands	70.4562	0.1101	0.0281
1700	Institutional	1677.9117	2.6217	0.6686
1800	Recreational	708.7849	1.1075	0.2824
1820	Golf courses	1457.8803	2.2779	0.5809
1830	Race tracks	95.5304	0.1493	0.0381
1840	Marinas & fish camps	5.8271	0.0091	0.0023
1850	Parks and zoos	180.4337	0.2819	0.0719
1900	Open land	2461.5582	3.8462	0.9809
1920	Inactive land with street pattern but no structures	3468.0014	5.4188	1.3820
2110	Improved pastures (monocult, planted forage crops)	17991.6752	28.1121	7.1694
2120	Unimproved pastures	1649.9953	2.5781	0.6575
2130	Woodland pastures	700.6857	1.0948	0.2792
2140	Row crops	16.5743	0.0259	0.0066
2150	Field crops	5207.6882	8.1370	2.0752
2200	Tree crops	165.0212	0.2578	0.0658
2210	Citrus groves	3170.6287	4.9541	1.2635
2240	Abandoned tree crops	3870.7186	6.0480	1.5424
2310	Cattle feeding operations	52.5004	0.0820	0.0209
2320	Poultry feeding operations	92.3676	0.1443	0.0368
2400	Nurseries and vineyards	34.0689	0.0532	0.0136
2410	Tree nurseries	77.2918	0.1208	0.0308
2430	Ornamentals	3015.7029	4.7121	1.2017
2431	Shade ferns	276.8826	0.4326	0.1103
2432	Hammock ferns	89.3782	0.1397	0.0356
2450	Floriculture	15.5277	0.0243	0.0062
2500	Specialty farms	21.5957	0.0337	0.0086
2510	Horse farms	1006.0383	1.5719	0.4009
2540	Aquaculture	13.7481	0.0215	0.0055
2600	Other open lands - rural	11.1928	0.0175	0.0045
2610	Fallow cropland	359.7128	0.5621	0.1433

Table F-10 (continued)

LEVEL3	ATTRIBUTE	ACRES	SQ MILES	PERCENTAGE
3100	Herbaceous range	7076.8879	11.0577	2.8200
3200	Shrub and brushland (wax myrtle or saw palmetto, occasionally scrub oak)	5787.1031	9.0424	2.3061
3300	Mixed rangeland	4779.9477	7.4687	1.9047
4110	Pine flatwoods	14684.2343	22.9442	5.8515
4120	Longleaf pine - xeric oak	1883.0413	2.9423	0.7504
4130	Sand pine	8601.1962	13.4394	3.4275
4200	Upland hardwood forests	415.4240	0.6491	0.1655
4210	Xeric oak	1506.5707	2.3540	0.6003
4340	Upland mixed coniferous/hardwood	14503.4500	22.6617	5.7794
4410	Coniferous pine	6133.5287	9.5837	2.4441
4430	Forest regeneration	7237.6258	11.3088	2.8841
5100	Streams and waterways	263.1759	0.4112	0.1049
5200	Lakes	10271.7099	16.0496	4.0931
5300	Reservoirs - pits, retention ponds, dams	366.5849	0.5728	0.1461
5340	Reservoirs less than 10 acres	929.6811	1.4526	0.3705
6110	Bay swamp (if distinct)	4168.2822	6.5130	1.6610
6150	River/lake swamp (bottomland, may include cypress)	17637.1415	27.5581	7.0282
6170	Mixed wetland hardwoods	920.7072	1.4386	0.3669
6200	Wetland coniferous forests	632.9495	0.9890	0.2522
6210	Cypress (if distinct as in domes or pure stands)	102.3029	0.1598	0.0408
6220	Depressional pine	96.4106	0.1506	0.0384
6300	Wetland forested mixed	17486.4760	27.3227	6.9681
6410	Freshwater marshes	4640.2146	7.2504	1.8491
6430	Wet prairies	1139.5051	1.7805	0.4541
6440	Emergent aquatic vegetation	874.1863	1.3659	0.3484
6460	Mixed scrub-shrub wetland	3994.7388	6.2418	1.5919
6500	Non-vegetated wetland	2.8685	0.0045	0.0011
7200	Sand other than beaches	3.2987	0.0052	0.0013
7400	Disturbed land - use level II class. code for rural land in transition, fill areas, burned areas	1.4965	0.0023	0.0006
7410	Rural land in transition without positive indicators of intended activity	1094.1967	1.7097	0.4360
7420	Borrow areas - associated with nearby fill areas for construction	64.7316	0.1011	0.0258
7430	Spoil areas	14.7264	0.0230	0.0059
8110	Airports	23.6392	0.0369	0.0094
8140	Roads and highways (divided 4-lanes with medians)	1738.0306	2.7157	0.6926
8180	Auto parking facilities	7.4095	0.0116	0.0030
8200	Communications	79.5700	0.1243	0.0317
8310	Electrical power facilities	46.4962	0.0727	0.0185
8320	Electrical power transmission lines	228.1325	0.3565	0.0909
8330	Water supply plants	72.5059	0.1133	0.0289
8340	Sewage treatment	192.4598	0.3007	0.0767

Appendix G: STORET Stations by Planning Unit for the Middle St. Johns Basin

Planning Unit & WBID	Water-body Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Alexander Springs Creek Planning Unit = 23 stations								
2918B	LAKE	BUCK LAKE	2	21FLCEN 20010080	Buck Lake at center, Ocala National Forest	1999	1999	13
2918B	LAKE	BUCK LAKE		1118ATL8050519	BUCK LAKE	1992	1997	81
2918C	LAKE	SELLARS LAKE	6	1118ATL8050553	SELLERS LAKE	1993	1993	3
2918C	LAKE	SELLARS LAKE		21FLKWATSELLERS3	LAKE SELLERS3 IN LAKE CO.- SEE NOTE	1992	2001	370
2918C	LAKE	SELLARS LAKE		21FLKWATSELLERS2	LAKE SELLERS2 IN LAKE CO.- SEE NOTE	1992	2001	367
2918C	LAKE	SELLARS LAKE		21FLKWATSELLERS1	LAKE SELLERS1 IN LAKE CO.- SEE NOTE	1992	2001	370
2918C	LAKE	SELLARS LAKE		21FLA 20020496	SELLERS LAKE- CENTER OF LAKE	1992	1996	171
2918C	LAKE	SELLARS LAKE		21FLSJWMSSELLK	SELLERS LAKE	1993	1993	54
2918D	LAKE	ECHO LAKE	3	21FLKWAT083ECHO1		1992	1993	12
2918D	LAKE	ECHO LAKE		21FLKWAT083ECHO3		1992	1993	12
2918D	LAKE	ECHO LAKE		21FLKWAT083ECHO2		1992	1993	11
2918Z	SPRING	ALEXANDER SPRINGS	1	21FLGW 9670	ALEXANDER SPRINGS	2001	2001	15
2930A	LAKE	AKRON LAKE	5	21FLSJWMAKRN	AKRON LAKE @ CENTER	1992	1992	30
2930A	LAKE	AKRON LAKE		21FLKWAT069AKRON3		1998	2000	36
2930A	LAKE	AKRON LAKE		21FLKWAT069AKRON1		1998	2000	36
2930A	LAKE	AKRON LAKE		21FLLCPCLKAKRON	AKRON LAKE CENTER @ PAISLEY	1996	1999	114
2930A	LAKE	AKRON LAKE	5	21FLKWAT069AKRON2		1998	2000	36
2930D	LAKE	BLUE LAKE	3	21FLKWATBLUE069-1		1995	2001	169
2930D	LAKE	BLUE LAKE		21FLKWATBLUE069-2		1995	2001	169
2930D	LAKE	BLUE LAKE		21FLKWATBLUE069-3		1995	2001	169
2930E	LAKE	SILVER PAISLEY LAKE	3	21FLKWATSILVER PAISLEY1	LAKE SILVER PAISLEY1 IN LAKE CO.-	1993	1997	99
2930E	LAKE	SILVER PAISLEY LAKE		21FLKWATSILVER PAISLEY3	LAKE SILVER PAISLEY3 IN LAKE CO.	1993	1997	94
2930E	LAKE	SILVER PAISLEY LAKE		21FLKWATSILVER PAISLEY2	LAKE SILVER PAISLEY2 IN LAKE CO.-	1993	1997	102

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Deep Creek Planning Unit = 29 stations								
2893F	STREAM	STJ RIV AB LK JESSUP	2	21FLSJWMOW-SJR-1	MIDDLE OF ST JOHNS RIVER NO OF LK JESUP	1996	1997	599
2893F	STREAM	STJ RIV AB LK JESSUP		21FLVEMDSJ05	ST. JOHNS RIVER AT LEMON BLUFF	1992	1998	1310
2893H	LAKE	MULLET LAKE	4	21FLKWAT117MULLET2		2001	2001	16
2893H	LAKE	MULLET LAKE		21FLKWAT117MULLET1		2001	2001	16
2893H	LAKE	MULLET LAKE		21FLKWAT117MULLET3		2001	2001	16
2893H	LAKE	MULLET LAKE		21FLSEM MUL	MULLET LAKE	1998	1998	11
2925	BLACKWATER	DEEP CR-LK ASHBY CA	5	21FLKWATASHBY3	ASHBY IN VOLUSIA CO.	1993	2001	399
2925	BLACKWATER	DEEP CR-LK ASHBY CA		21FLKWATASHBY1	ASHBY IN VOLUSIA CO.	1993	2001	403
2925	BLACKWATER	DEEP CR-LK ASHBY CA		21FLA 20010492	LAKE ASHBY CENTER - VOLUSIA CO.	1996	1996	17
2925	BLACKWATER	DEEP CR-LK ASHBY CA		21FLSJWMDMR	DEEP CREEK AT MAYTOWN ROAD BRIDGE	1994	2001	1570
2925	BLACKWATER	DEEP CR-LK ASHBY CA		21FLKWATASHBY2	ASHBY IN VOLUSIA CO.	1993	2001	400
2925A	LAKE	LAKE ASHBY	2	21FLSJWMASH	CENTER LAKE ASHBY	1995	2001	1663
2925A	LAKE	LAKE ASHBY		21FLSJWMLACM	LAKE ASHBY CANAL @ MAYTOWN RD	1993	1993	54
2931	LAKE	LK WINNEMISSETT OUTLET	4	21FLKWA2WINNEMISSETT1	WINNEMISSETT IN VOLUSIA CO.	1992	2001	335
2931	LAKE	LK WINNEMISSETT OUTLET		21FLKWATWINNEMISSETT2	WINNEMISSETT IN VOLUSIA CO.	1992	2001	336
2931	LAKE	LK WINNEMISSETT OUTLET		21FLKWATWINNEMISSETT3	WINNEMISSETT IN VOLUSIA CO.	1992	2001	337
2931	LAKE	LK WINNEMISSETT OUTLET		21FLSJWMMWIN	CENTER OF LAKE WINNEMISSETT NEAR DELAND	1994	2001	1599
2964	STREAM	UNDERHILL SLOUGH	24	21FLGFWFGCCR0188	ST. JOHNS RIVER EXIT TO LAKE HARNEY	1992	1996	341
2964	STREAM	UNDERHILL SLOUGH		21FLVEMDSJ04	ST. JONHS RIVER AT NORTH END LAKE HARNEY	1992	1998	1609
2964A	LAKE	LAKE HARNEY	10	21FLA 20010012	ST JOHNS R AT FLA HWY NO 46	1992	1995	276
2964A	LAKE	LAKE HARNEY		21FLORANSJ27	ST. JOHNS R. AT SR46	1992	1998	859
2964A	LAKE	LAKE HARNEY		21FLKWATHARNEY1	HARNEY IN VOLUSIA CO.-SEE NOTE	1992	2001	266
2964A	LAKE	LAKE HARNEY		21FLVEMDSJ03	LAKE HARNEY - CENTER OF THE LAKE	1992	1998	1752
2964A	LAKE	LAKE HARNEY		21FLVEMDSJ02	ST. JOHNS RIVER AT SOUTHERN END LAKE HARNEY	1992	1998	1353
2964A	LAKE	LAKE HARNEY		21FLCEN 20010026	Lake Harney, Center of Lake	1999	1999	8

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Deep Creek Planning Unit (continued)								
2964A	LAKE	LAKE HARNEY		21FLVEMDVC-042	St. Johns River, center of Lake Harney	1999	2001	267
2964A	LAKE	LAKE HARNEY		21FLKWATHARNEY3	HARNEY IN VOLUSIA CO.-SEE NOTE	1992	2001	260
2964A	LAKE	LAKE HARNEY		21FLSJWMSRN	ST JOHNS R AT SR 46 - SEMINOLE RANCH NTH BOUND	1992	1998	1557
2964A	LAKE	LAKE HARNEY		21FLKWATHARNEY2	HARNEY IN VOLUSIA CO.-SEE NOTE	1992	2001	266
Econlockhatchee River Planning Unit = 78 Stations								
2991	STREAM	ECONLOCKHATCHEE RIVER	11	21FLORANBEI	TRIBUTARY ON ALTMAN RANCH	1994	1998	155
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLORANBEH	ECONLOCKHATCHEE R. AT WEEWAHOOTEE RD.	1992	1994	143
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLORANBEG	ECONLOCKHATCHEE R. AT POWERLINE RIGHT OF WAY	1992	1998	1223
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLORANBEF	ECONLOCKHATCHEE R. AT OLD CHENEY	1992	1998	1080
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLORANBEB	ECONLOCKHATCHEE R. AT HWY 420	1992	1998	1115

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Econlockhatchee River Planning Unit (continued)								
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLORANBEA	ECONLOCKHATCHEE R. AT BEELINE	1992	1995	256
2991	STREAM	ECONLOCKHATCHEE RIVER		112WRD 02233500	ECONLOCKHATCHEE RIVER NR. CHULUOTA, FLA.	2000	2000	47
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLSJWMBE420	BIG ECONLOCKHATCHEE @ SR 420	1993	1993	81
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLCEN 20010301	Big Econ at Beeline Highway	1999	1999	2
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLCEN 20010129	Big Econlockhatchee River at SR 420	1999	1999	34
2991	STREAM	ECONLOCKHATCHEE RIVER		21FLA 20010129	BIG ECONLOCKHATCHEE R SR #420	1992	1997	171
2991A	STREAM	ECONLOCKHATCHEE RIVER	11	21FLCEN 20010300	Big Econ at Snow Hill Road	1999	1999	34
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLCEN 20010130	Big Econlockhatchee River at SR 419	1999	1999	35
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLGFWFGCCR0173	ECONLOCKHATCHEE RIVER AT TREE LINE	1992	1996	325
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLSJWMECH	BIG ECONLOCKHATCHEE R AT SNOW HILL ROAD	1992	2001	3794
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLORANSJ26	ECONLOCKHATCHEE R. AT MOUTH	1992	1998	1042
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLA 20010300	BIG ECON SNOW HILL RD	1996	1996	14
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLORANBEE	ECONLOCKHATCHEE R. AT SNOWHILL RD. - CHULUOTA	1992	1998	1107
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLSEM BECO	ECONLOCKHATCHEE RIVER	2000	2001	43
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLORANBED	ECONLOCKHATCHEE R. AT HWY 419 (OVIEDO CHULUOTA)	1992	1998	1041
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLSEM SNO	ECONLOCKHATCHEE RIVER	2001	2001	35
2991A	STREAM	ECONLOCKHATCHEE RIVER		21FLA 20010130	BIG ECONLOCKHATCHEE R SR #419	1993	1995	141

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Econlockhatchee River Planning Unit (continued)								
3001	STREAM	LITTLE ECONLOCKHATCHEE	12	21FLORANBEC	ECONLOCKHATCHEE R. AT L. ECON. R.	1992	1998	963
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLSEM LECO	LITTLE ECONLOCKHATCHEE	2000	2001	42
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLSJWM02233200	LITTLE ECONLOCKHATCHEE R NR UNION PARK FLA	1998	1998	78
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLORANLEE	L. ECON. R. AT N-S CANAL SWD 2	1992	1998	615
3001	STREAM	LITTLE ECONLOCKHATCHEE	0	21FLORANLER	L. ECON. R. AT BUCK RD.	1992	1998	648
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLORANLET	L. ECON. R. AT GAUGING STA. B-D RD. SWD 6	1992	1998	694
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLORANLEH	L. ECON. R. AT HWY 50	1992	1998	652
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLA 20010041	Little Econ River at confluence with Big Econ Riv	1996	1996	14
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLA 20010040	LITTLE ECON RIVER AT CURRY FORD RD.	1996	1996	21
3001	STREAM	LITTLE ECONLOCKHATCHEE		112WRD 02233200	LITTLE ECONLOCKHATCHEE R NR UNION PARK, FLA.	1994	2000	80
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLCEN 20010041	Little Econ River at confluence with Big Econ Rive	1999	1999	34
3001	STREAM	LITTLE ECONLOCKHATCHEE		21FLORANLEZI	L. ECON. R. ABOUT 100 YDS. BELOW IRON BR. STP	1992	1998	614
3001A	LAKE	LONG LAKE	3	21FLKWATLONG117-3	LONG IN SEMINOLE CO.-SEE NOTE	1992	1998	250
3001A	LAKE	LONG LAKE		21FLKWATLONG117-2	LONG IN SEMINOLE CO.-SEE NOTE	1992	1998	247
3001A	LAKE	LONG LAKE		21FLKWATLONG117-1	LONG IN SEMINOLE CO.-SEE NOTE	1992	1998	244
3003	LAKE	LAKE PICKETT	2	21FLORANBE9E	CENTER OF LAKE PICKETT'S EAST LOBE	1992	1998	683
3003	LAKE	LAKE PICKETT		21FLORANBE9W	CENTER OF LAKE PICKETT'S WEST LOBE	1992	1998	631
3003A	LAKE	LAKE MILLS	4	21FLKWATMILLS1	MILLS IN SEMINOLE CO.-SEE NOTE	1993	1993	18
3003A	LAKE	LAKE MILLS		21FLKWATMILLS2	MILLS IN SEMINOLE CO.-SEE NOTE	1993	1993	12
3003A	LAKE	LAKE MILLS		21FLKWATMILLS3	MILLS IN SEMINOLE CO.-SEE NOTE	1993	1993	12
3003A	LAKE	LAKE MILLS		21FLSEM MIL	MILLS, LAKE	1999	2001	68
3014	STREAM	CRANE STRAND DRAIN	3	21FLSEM CRA	CRANES STAND CANAL	2000	2001	49
3014	STREAM	CRANE STRAND DRAIN		21FLA 20010281	CRANE STRAND CNL AT DNG DITCH	1993	1993	2
3014	STREAM	CRANE STRAND DRAIN		21FLCEN 20010357	Crane Strand Canal at University Blvd	1999	1999	35

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Econlockhatchee River Planning Unit (continued)								
3017	LAKE	LAKE IRMA OUTLET	4	21FLKWATIRMA2	LAKE IRMA2 IN ORANGE CO.	1994	2001	38
3017	LAKE	LAKE IRMA OUTLET		21FLKWATIRMA3	LAKE IRMA3 IN ORANGE CO.	1994	2001	38
3017	LAKE	LAKE IRMA OUTLET		21FLSJWMIRMA	LAKE IRMA OFF SR 436A NEAR ORLANDO	1993	1993	54
3017	LAKE	LAKE IRMA OUTLET		21FLKWATIRMA1	LAKE IRMA1 IN ORANGE CO.	1994	2001	38
3018	LAKE	LAKE LOUISE OUTLET	1	21FLORANBE7	LAKE LOUISE CENTER	1994	1998	443
3022	STREAM	BITHLO BRANCH	1	21FLCEN 20010350	Bithlo Branch at Old Highway 50	1999	1999	33
3023	STREAM	CRANE STRAND	3	21FLORANLEP	L. ECON. R. AT ECONLOCKHATCHEE TRAIL	1992	1998	666
3023	STREAM	CRANE STRAND		21FLORANLEO	L. ECON. TRIB. AT HARREL RD. BEFORE BANNER DAM	1992	1998	684
3023	STREAM	CRANE STRAND		21FLSJWMUSJ915	CRANE STRAND AT SR 50	1992	1993	38
3023A	LAKE	LAKE BALDWIN	6	21FLORANLEZB	LAKE BALDWIN OUTFALL AT HWY 436	1992	1998	572
3023A	LAKE	LAKE BALDWIN		21FLORANLE7	LAKE BALDWIN	1992	1998	607
3023A	LAKE	LAKE BALDWIN		21FLKWAT095BALDWIN3		2001	2001	12
3023A	LAKE	LAKE BALDWIN		21FLKWAT095BALDWIN1		2001	2001	12
3023A	LAKE	LAKE BALDWIN		21FLORL BALDWIN	LAKE BALDWIN	1993	1997	283
3023A	LAKE	LAKE BALDWIN		21FLKWAT095BALDWIN2		2001	2001	12
3023B	LAKE	LAKE BARTON	4	21FLORANLE2	LAKE BARTON	1992	1998	613
3023B	LAKE	LAKE BARTON		21FLKWATBARTON2	LAKE BARTON2 IN ORANGE CO.	1993	1997	28
3023B	LAKE	LAKE BARTON		21FLKWATBARTON1	LAKE BARTON1 IN ORANGE CO.	1993	1997	28
3023B	LAKE	LAKE BARTON		21FLKWATBARTON3	LAKE BARTON3 IN ORANGE CO.	1993	1997	28
3023C	LAKE	LAKE SUSANNAH	4	21FLKWATSUSANNAH1	LAKE SUSANNAH1 IN ORANGE CO.	1992	2001	362

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Econlockhatchee River Planning Unit (continued)								
3023C	LAKE	LAKE SUSANNAH		21FLKWATSUSANNAH2	LAKE SUSANNAH2 IN ORANGE CO.	1992	2001	357
3023C	LAKE	LAKE SUSANNAH		21FLORL SUZANNAH	LAKE SUZANNAH	1993	1997	300
3023C	LAKE	LAKE SUSANNAH		21FLKWATSUSANNAH3	LAKE SUSANNAH3 IN ORANGE CO.	1992	2001	370
3024	LAKE	LAKE DOWNEY	1	21FLORANLE10	LAKE DOWNEY	1992	1998	569
3030	STREAM	LONG BRANCH	2	21FLSJWMUSJ070	LONG BRANCH AT HWY 13	1992	1993	27
3030	STREAM	LONG BRANCH		21FLCEN 20010384	Long Branch at State Road 13 in Bithlo	1999	1999	34
3036	LAKE	LAKE FREDERICA	5	21FLKWATFREDRICA1	LAKE FREDRICA1 IN ORANGE CO.	1992	1994	76
3036	LAKE	LAKE FREDERICA		21FLORANLE13	LAKE FREDERICA	1992	1998	552
3036	LAKE	LAKE FREDERICA		21FLKWATFREDRICA3	LAKE FREDRICA3 IN ORANGE CO.	1992	1994	74
3036	LAKE	LAKE FREDERICA		21FLKWATFREDRICA2	LAKE FREDRICA2 IN ORANGE CO.	1992	1994	66
3036	LAKE	LAKE FREDERICA		21FLORL FREDRICA	LAKE FREDRICA	1993	1997	300
Lake George Planning Unit = 61 Stations								
2213O	STREAM	STJ RIV AB OKLAWAHA R	3	21FLA 20030521	ST. JOHNS RIVER AT MARKER 53	1992	1994	208
2213O	STREAM	STJ RIV AB OKLAWAHA R		21FLA 20030520	ST. JOHNS RIVER AT MARKER 59	1992	1994	208
2213O	STREAM	STJ RIV AB OKLAWAHA R		21FLSJWMMSJFGF	Middle St. Johns R. Near Ft. Gates Ferry	1997	2001	1047
2892	LAKE	LAKE MARGARET	3	21FLA 20030435	LAKE MARGARET NW SECTOR	1994	1994	15
2892	LAKE	LAKE MARGARET		21FLA 20030433	LAKE MARGARET SE SECTOR	1994	1994	15
2892	LAKE	LAKE MARGARET		21FLA 20030434	LAKE MARGARET CENTER	1994	1994	22
2892A	LAKE	LAKE COMO	3	21FLKWATCOMO1	COMO LAKE IN PUTNAM CO	1992	2001	403
2892A	LAKE	LAKE COMO		21FLKWATCOMO2	COMO LAKE IN PUTNAM CO	1992	2001	400
2892A	LAKE	LAKE COMO		21FLKWATCOMO3	COMO LAKE IN PUTNAM CO	1992	2001	401
2892B	LAKE	BANANA LAKE	3	21FLKWATBANANA1	BANANA LAKE IN PUTNAM CO	1992	1998	261
2892B	LAKE	BANANA LAKE		21FLKWATBANANA3	BANANA LAKE IN PUTNAM CO	1992	1998	257
2892B	LAKE	BANANA LAKE		21FLKWATBANANA2	BANANA LAKE IN PUTNAM CO	1992	1998	263
2892C	LAKE	LAKE ESTELLA	6	21FLKWATSOUTH ESTELLA2	SOUTH ESTELLA LAKE IN PUTNAM	1993	1999	237
2892C	LAKE	LAKE ESTELLA		21FLKWATSOUTH ESTELLA1	SOUTH ESTELLA LAKE IN PUTNAM CO	1993	1999	240

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake George Planning Unit (continued)								
2892C	LAKE	LAKE ESTELLA	6	21FLKWATNORTH ESTELLA3	NORTH ESTELLA LAKE IN PUTNAM CO	1992	2001	174
2892C	LAKE	LAKE ESTELLA		21FLKWATSOUTH ESTELLA3	SOUTH ESTELLA LAKE IN PUTNAM CO	1993	1999	239
2892C	LAKE	LAKE ESTELLA		21FLKWATNORTH ESTELLA2	NORTH ESTELLA LAKE IN PUTNAM CO	1992	2001	174
2892C	LAKE	LAKE ESTELLA		21FLKWATNORTH ESTELLA1	NORTH ESTELLA LAKE IN PUTNAM CO	1992	2001	175
28934	SPRING	SILVER GLEN SPRING	3	21FLKWAT083SILVER GLEN1		1992	2001	140
28934	SPRING	SILVER GLEN SPRING		21FLKWAT083SILVER GLEN2		1992	2001	143
28934	SPRING	SILVER GLEN SPRING		21FLKWAT083SILVER GLEN3		1992	2001	144
2893A	LAKE	LAKE GEORGE	23	21FLKWAT107GEORGESOUTH2		1999	2001	112
2893A	LAKE	LAKE GEORGE		21FLKWAT107GEORGESOUTH1		1999	2001	99
2893A	LAKE	LAKE GEORGE		21FLSJWM20010002	ST. JOHNS RIVER AT HWY 40 NEAR ASTOR	1995	1998	788
2893A	LAKE	LAKE GEORGE		21FLKWAT107GEORGESOUTH3		1999	2001	114
2893A	LAKE	LAKE GEORGE		21FLSJWMLEO	LAKE GEORGE 50 M WEST OF CM'S 4 & 5	1992	1998	1284
2893A	LAKE	LAKE GEORGE		21FLSJWMLGI	LAKE GEORGE AT INLET	1993	1993	1
2893A	LAKE	LAKE GEORGE		21FLSJWMLAG	LAKE GEORGE AT CM #9	1992	1998	1304
2893A	LAKE	LAKE GEORGE		21FLSJWMSAVLKGRO	Lake George outside grass bed	2000	2001	479
2893A	LAKE	LAKE GEORGE		21FLSJWMMSJLGM	MIDDLE ST. JOHNS LAKE GEORGE MIDDLE	1998	1999	205
2893A	LAKE	LAKE GEORGE		21FLKWATGEORGE107-2	GEORGE LAKE IN PUTNAM CO	1995	1995	24
2893A	LAKE	LAKE GEORGE		21FLKWATGEORGE107-1	GEORGE LAKE IN PUTNAM CO	1995	1995	24
2893A	LAKE	LAKE GEORGE		21FLKWATGEORGE107-3	GEORGE LAKE IN PUTNAM CO	1995	1995	24
2893A	LAKE	LAKE GEORGE		21FLVEMDSJ27	ST. JOHNS RIVER 0.5 MI. SOUTH OF HWY 40 - ASTOR	1992	1998	1365
2893A	LAKE	LAKE GEORGE		21FLSJWMSJR40	SJR @ HWY 40 NEAR ASTOR	1993	1999	332
2893A	LAKE	LAKE GEORGE		21FLSJWMSAVLKGRI	Lake George inside grass bed	2000	2001	479

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake George Planning Unit (continued)								
2893A	LAKE	LAKE GEORGE		21FLVEMDSJ29	LAKE GEORGE AT CM 9	1992	1998	1761
2893A	LAKE	LAKE GEORGE		21FLVEMDVC-067	St. John's River, at center of Lake George, at CM	1999	2001	257
2893A	LAKE	LAKE GEORGE		21FLA 20010002	ST JOHNS RIVER AT HWY 40 NEAR ASTOR	1992	1998	641
2893A	LAKE	LAKE GEORGE		21FLSJWMMSJLGN	MIDDLE ST. JOHNS LAKE GEORGE NORTH, MID-CHANNEL	1998	1999	225
2893A	LAKE	LAKE GEORGE		21FLSJWMMSJLGS	MIDDLE ST. JOHNS LAKE GEORGE SOUTH, MID-CHANNEL	1998	1999	231
2893A	LAKE	LAKE GEORGE		21FLKWAT107GEORGE EAST1		1998	2001	140
2893A	LAKE	LAKE GEORGE		21FLKWAT107GEORGE EAST2		1998	2001	140
2893A	LAKE	LAKE GEORGE		21FLKWAT107GEORGE EAST3		1998	2001	140
2893A1	STREAM	STJ RIV BL LK GEORGE	5	21FLSJWM20030373	ST. JOHNS RIVER AT CM 72	1995	1998	811
2893A1	STREAM	STJ RIV BL LK GEORGE		21FLSJWMLG13	SJR West of Drayton Island, West Bank	1993	1997	774
2893A1	STREAM	STJ RIV BL LK GEORGE		21FLSJWMLG12	SJR btw Drayton Isl and Hog Isl, Mid Channel	1993	2001	1877
2893A1	STREAM	STJ RIV BL LK GEORGE		21FLSJWMLG11	SJR West of Drayton Island, East Bank	1993	1997	845
2893A1	STREAM	STJ RIV BL LK GEORGE		21FLA 20030373	ST JOHNS RIVER CHAN MARK 72	1992	1995	222
2893A2	STREAM	STJ RIV AB LK GEORGE	3	21FLVEMDVC-065	St. John's River, about 1/2 mile S. of S.R.40	1999	2001	247
2893A2	STREAM	STJ RIV AB LK GEORGE		21FLVEMDSJ28	ST. JOHNS RIVER AT CM 19	1992	1998	1324
2893A2	STREAM	STJ RIV AB LK GEORGE		21FLVEMDVC-066	St. John's River, at CM 19	1999	2001	274
2896	LAKE	CLEAR LAKE	3	21FLKWATCLEAR107-2	CLEAR LAKE IN PUTNAM CO	1992	1993	34
2896	LAKE	CLEAR LAKE		21FLKWATCLEAR107-3	CLEAR LAKE IN PUTNAM CO	1992	1993	34
2896	LAKE	CLEAR LAKE		21FLKWATCLEAR107-1	CLEAR LAKE IN PUTNAM CO	1992	1993	34
2902	LAKE	LOWER LOUISE LAKE	3	21FLKWATLOWER LOUISE1	LOWER LOUISE IN VOLUSIA CO.	1992	2001	107
2902	LAKE	LOWER LOUISE LAKE		21FLKWATLOWER LOUISE3	LOWER LOUISE IN VOLUSIA CO.	1992	2001	117
2902	LAKE	LOWER LOUISE LAKE		21FLKWATLOWER LOUISE2	LOWER LOUISE IN VOLUSIA CO.	1992	2001	119
2916A	LAKE	CROOKED LAKE	3	21FLKWATCROOKED3	LAKE CROOKED3 LAKE CO	1992	2001	463

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake George Planning Unit (continued)								
2916A	LAKE	CROOKED LAKE		21FLKWATCROOKED2	LAKE CROOKED2 LAKE CO	1992	2001	467
2916A	LAKE	CROOKED LAKE		21FLKWATCROOKED1	LAKE CROOKED1 LAKE CO	1992	2001	473
Lake Jessup Planning Unit = 241 Stations								
2981	LAKE	LAKE JESSUP	22	21FLGFWGFCR0477	LAKE JESSUP MID LAKE	1992	1996	324
2981	LAKE	LAKE JESSUP		21FLSJRW-1	Rotten Egg Slough on the East side of Lake Jessup	1995	2000	1195
2981	LAKE	LAKE JESSUP		21FLVEMDSJ07	LAKE JESSUP SOUTH OF S.R. 46 BRIDGE	1992	1998	1063
2981	LAKE	LAKE JESSUP		21FLSJRWOW-2	Lk Jessup off Grassy Point	1995	2001	1670
2981	LAKE	LAKE JESSUP		21FLSJRWOW-3	Lk Jessup betwn Seevee Island & Long Point	1995	2000	1257
2981	LAKE	LAKE JESSUP		21FLSJWMLJESS	LAKE JESSUP WEST LOBE	1992	1995	392
2981	LAKE	LAKE JESSUP		21FLSJRW-5	Howell Creek Delta on SW end of Lake Jessup	1995	2001	1859
2981	LAKE	LAKE JESSUP		21FLKWAT117JESUP NORTH1		2001	2001	44
2981	LAKE	LAKE JESSUP		21FLKWAT117JESUP NORTH2		2001	2001	44
2981	LAKE	LAKE JESSUP		21FLKWATJESSUP2	JESSUP IN SEMINOLE CO.	1992	2000	155
2981	LAKE	LAKE JESSUP		21FLSJRWOW-5	Lk Jessup between Caldwell Fields	1995	2000	1631
2981	LAKE	LAKE JESSUP		21FLSJRWOW-7	Lk Jessup betwn Marl Bed and Long Point	1995	2000	1396
2981	LAKE	LAKE JESSUP		21FLKWATJESSUP1	JESSUP IN SEMINOLE CO.	1992	2000	146
2981	LAKE	LAKE JESSUP		21FLSJWOW-0BC	ORANGE BOAT CLUB WEST OF EXPRESS WAY	1995	1996	45
2981	LAKE	LAKE JESSUP		21FLSJWMSJ027	LAKE JESSUP NORTH END NEAR SR 46	1992	1993	40
2981	LAKE	LAKE JESSUP		21FLKWATJESSUP3	JESSUP IN SEMINOLE CO.-SEE NOTE	1992	2000	155
2981	LAKE	LAKE JESSUP		21FLVEMDVC-045	St. John's River, at Lake Jessup, S. of S.R.46	1999	2001	251
2981	LAKE	LAKE JESSUP		21FLSJRWOW-4	Lk Jessup W of bridge betwn Whites Lndg & Bird Isla	1995	2001	1685
2981	LAKE	LAKE JESSUP		21FLA 20010183	LAKE JESSUP NE SECTOR	1992	1998	587
2981	LAKE	LAKE JESSUP		21FLKWAT117JESUP NORTH3		2001	2001	44
2981	LAKE	LAKE JESSUP		21FLSJRWOW-6	Lk Jessup off center of Far W Arm	1995	2001	2261

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Jesup Planning Unit (continued)								
2981	LAKE	LAKE JESSUP		21FLSJWMOW-MBS	LAKE JESSUP MARL BED SLOUGH SITE	1997	1997	119
2982A	LAKE	SILVER LAKE	3	21FLKWAT117SILVER3		1998	2001	97
2982A	LAKE	SILVER LAKE		21FLKWAT117SILVER2		1998	2001	95
2982A	LAKE	SILVER LAKE		21FLKWAT117SILVER1		1998	2001	93
2982B	LAKE	GOLDEN LAKE	4	21FLSEM GOL	GOLDEN LAKE	1999	2001	60
2982B	LAKE	GOLDEN LAKE		21FLKWAT117GOLDEN3		1998	1998	20
2982B	LAKE	GOLDEN LAKE		21FLKWAT117GOLDEN1		1998	1998	20
2982B	LAKE	GOLDEN LAKE		21FLKWAT117GOLDEN2		1998	1998	20
2984	LAKE	LAKE NAN	4	21FLORANHB29	LAKE NAN CANTER	1994	1998	461
2984	LAKE	LAKE NAN		21FLKWATNAN1	LAKE NAN1 IN ORANGE CO.	1992	1999	315
2984	LAKE	LAKE NAN		21FLKWATNAN2	LAKE NAN2 IN ORANGE CO.	1992	1999	316
2984	LAKE	LAKE NAN		21FLKWATNAN3	LAKE NAN3 IN ORANGE CO.	1992	1999	315
2984A	LAKE	LAKE JENNIE	3	21FLKWAT117JENNIE1		2000	2001	35
2984A	LAKE	LAKE JENNIE		21FLKWAT117JENNIE2		2000	2001	35
2984A	LAKE	LAKE JENNIE		21FLKWAT117JENNIE3		2000	2001	35
2986	STREAM	SOLDIER CREEK REACH	7	21FLSEM SOL	SOLDIERS CREEK	1998	2001	83
2986	STREAM	SOLDIER CREEK REACH		21FLSJRW-8	Gee and Soldier Creek Delta west of Lake Jesup	1995	2001	2440
2986	STREAM	SOLDIER CREEK REACH		21FLSJWMUSJ906	SOLDIER CREEK NEAR MOUTH	1992	1993	40
2986	STREAM	SOLDIER CREEK REACH		21FLSJRW-10	Soldier Creek at SR419 off West End of Lake Jesup	1995	2000	1212
2986	STREAM	SOLDIER CREEK REACH		21FLCEN 20010184	Soldier Creek 100 yards downstream of S.R. Highway	1999	1999	6
2986	STREAM	SOLDIER CREEK REACH		21FLA 20010184	SOLDIER CR SR #419 MIDSTREAM	1996	1997	17
2986	STREAM	SOLDIER CREEK REACH		21FLSJWMSLC419	SOLDIER CREEK AT SR 419	1992	1995	361
2986A	LAKE	LAKE BINGHAM	3	21FLKWATBINGHAM3	BINGHAM IN SEMINOLE CO.	1992	1996	58
2986A	LAKE	LAKE BINGHAM		21FLKWATBINGHAM1	BINGHAM IN SEMINOLE CO.	1992	1996	57
2986A	LAKE	LAKE BINGHAM		21FLKWATBINGHAM2	BINGHAM IN SEMINOLE CO.	1992	1996	57

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Jesup Planning Unit (continued)								
2986B	LAKE	LAKE MYRTLE	4	21FLKWAT117MYRTLE3		1998	1999	33
2986B	LAKE	LAKE MYRTLE		21FLSEM ML02	MYRTLE, LAKE	1997	2001	371
2986B	LAKE	LAKE MYRTLE		21FLKWAT117MYRTLE2		1998	1999	32
2986B	LAKE	LAKE MYRTLE		21FLKWAT117MYRTLE1		1998	2001	48
2990	STREAM	SALT CREEK	1	21FLSJRW-2	Salt Creek Delta on Upper East side of Lake Jesup	1995	2000	1275
2992	STREAM	SWEETWATER CREEK	2	21FLSJRW-4A	Sweetwater Creek delta by Lake Jesup	2000	2001	230
2992	STREAM	SWEETWATER CREEK		21FLSJRW-4	Sweetwater Creek west end Palm Ave east of Jesup	1995	2000	1812
2994A	STREAM	GEE CREEK	6	21FLSEM GEE	GEE CREEK	1998	2001	82
2994A	STREAM	GEE CREEK		21FLSJWMGCR419	GEE CREEK AT SR 419	1992	1995	354
2994A	STREAM	GEE CREEK		21FLSJRWLJESS	Lake Jesup West Lobe	1992	1995	343
2994A	STREAM	GEE CREEK		21FLCEN 20010185	Gee Creek at S.R. Highway 419	1999	1999	6
2994A	STREAM	GEE CREEK		21FLSJRW-9	Gee Creek at SR419 off SW End of Lake Jesup	1995	2000	1215
2994A	STREAM	GEE CREEK		21FLA 20010185	GEE CR SR #419 MIDSTREAM	1997	1997	19
2994B	LAKE	LAKE KATHRYN	1	21FLA 20010222	L KATHRYN CENTER	1998	1998	17
2994B1	LAKE	TRIPLET LAKE	9	21FLKWATTRIPLETMIDDLE1		1996	2001	142
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETMIDDLE3		1996	2001	142
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETMIDDLE2		1996	2001	141
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETNORTH3		1996	2001	141
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETNORTH2		1996	2001	144
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETNORTH1		1996	2001	142
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETSSOUTH3		1996	2001	132
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETSSOUTH2		1996	2001	131
2994B1	LAKE	TRIPLET LAKE		21FLKWATTRIPLETSSOUTH1		1996	2001	132
2994C	LAKE	FAIRY LAKE	1	21FLSJWMUSJ909	FAIRY LAKE AT CENTER	1992	1992	18
2994C	LAKE	FAIRY LAKE		21FLSEM FAR	FAIRY LAKE	2001	2001	28
2994E	LAKE	RED BUG LAKE	45	21FLKWATRED BUG3	RED BUG IN SEMINOLE CO.	1992	1992	12
2994E	LAKE	RED BUG LAKE		21FLKWATRED BUG2	RED BUG IN SEMINOLE CO.	1992	1992	12
2994E	LAKE	RED BUG LAKE		21FLSEM RED	RED BUG LAKE	1999	2001	71
2994E	LAKE	RED BUG LAKE		21FLKWATRED BUG1	RED BUG IN SEMINOLE CO.	1992	1992	12
2994F	LAKE	ROCK LAKE	3	21FLKWATROCK LAKE3	ROCK IN SEMINOLE CO.	1992	2001	385
2994F	LAKE	ROCK LAKE		21FLKWATROCK LAKE2	ROCK IN SEMINOLE CO.	1992	2001	407
2994F	LAKE	ROCK LAKE		21FLKWATROCK LAKE1	ROCK IN SEMINOLE CO.	1992	2001	370
2994H	LAKE	LAKE GRIFFIN	3	21FLKWATGRIFFIN LAKE3	GRIFFIN IN SEMINOLE CO.	1992	1994	77
2994H	LAKE	LAKE GRIFFIN		21FLKWATGRIFFIN LAKE2	GRIFFIN IN SEMINOLE CO.	1992	1994	77

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Jesup Planning Unit (continued)								
2994H	LAKE	LAKE GRIFFIN		21FLKWATGRIFFIN LAKE1	GRIFFIN IN SEMINOLE CO.	1992	1994	78
2994X	LAKE	LITTLE LAKE HOWELL	3	21FLKWATLITTLEHOWELL1		1998	2001	107
2994X	LAKE	LITTLE LAKE HOWELL		21FLKWATLITTLEHOWELL2		1998	2001	104
2994X	LAKE	LITTLE LAKE HOWELL		21FLKWATLITTLEHOWELL3		1998	2001	106
2994Y	LAKE	FRUITWOOD LAKE	3	21FLKWATFRUITWOOD2	FRUITWOOD IN SEMINOLE CO.	1992	1999	294
2994Y	LAKE	FRUITWOOD LAKE		21FLKWATFRUITWOOD3	FRUITWOOD IN SEMINOLE CO.	1992	1999	290
2994Y	LAKE	FRUITWOOD LAKE		21FLKWATFRUITWOOD1	FRUITWOOD IN SEMINOLE CO.	1992	1999	294
2994Z	LAKE	PRAIRIE LAKE	4	21FLKWATPRAIRIE3	PRAIRIE IN SEMINOLE CO.	1995	2001	287
2994Z	LAKE	PRAIRIE LAKE		21FLKWATPRAIRIE2	PRAIRIE IN SEMINOLE CO.	1995	2001	275
2994Z	LAKE	PRAIRIE LAKE		21FLSEM PRA	PRAIRIE LAKE	1999	2001	54
2994Z	LAKE	PRAIRIE LAKE		21FLKWATPRAIRIE1	PRAIRIE IN SEMINOLE CO.	1995	2001	271
2995	LAKE	LAKE CHARM SHORT CUT C	3	21FLKWAT117CHARM1		2000	2000	9
2995	LAKE	LAKE CHARM SHORT CUT C		21FLKWAT117CHARM3		2000	2000	9
2995	LAKE	LAKE CHARM SHORT CUT C		21FLKWAT117CHARM2		2000	2000	9
2996	STREAM	SWEETWATER CREEK	1	21FLSJRW7-7	Sweetwater Ck at DeLeon&Cress run upstm fr Jesup	1995	2001	1849
2997	STREAM	HOWELL CK BL LK HOWELL	4	21FLSJRW7-6	Howell Creek at SR434 So of Whites Lodge on Jesup	1995	2000	1261
2997	STREAM	HOWELL CK BL LK HOWELL		21FLSEM HOWC	HOWELL CREEK	1998	2001	82
2997	STREAM	HOWELL CK BL LK HOWELL		21FLA 20010186	HOWELL CR SR #419 MIDSTREAM	1996	1997	17
2997	STREAM	HOWELL CK BL LK HOWELL		21FLSJWMHOW	HOWELL CREEK @ HWY 419	1992	1993	74
29975	LAKE	lake Sybella	3	21FLKWATSYBELIA1	LAKE SYBELIA1 IN ORANGE CO.	1999	2001	98
29975	LAKE	lake Sybella		21FLKWATSYBELIA2	LAKE SYBELIA2 IN ORANGE CO.	1999	2001	98
29975	LAKE	lake Sybella		21FLKWATSYBELIA3	LAKE SYBELIA3 IN ORANGE CO.	1999	2001	98
29976	LAKE	Lake Seminary	4	21FLKWATSEMINARY3	SEMINARY IN SEMINOLE CO.	1992	2001	366
29976	LAKE	Lake Seminary		21FLSEM SEM	SEMINARY, LAKE	1998	2001	82
29976	LAKE	Lake Seminary		21FLKWATSEMINARY2	SEMINARY IN SEMINOLE CO.	1992	2001	376
29976	LAKE	Lake Seminary		21FLKWATSEMINARY1	SEMINARY IN SEMINOLE CO.	1992	2001	380
29977	LAKE	Lake in the Woods	4	21FLKWATWOODS2	WOODS IN SEMINOLE CO.	1993	2001	394
29977	LAKE	Lake in the Woods		21FLKWATWOODS1	WOODS IN SEMINOLE CO.	1993	2001	394
29977	LAKE	Lake in the Woods		21FLSEM LOW	WOODS, LAKE OF THE	1999	2001	79
29977	LAKE	Lake in the Woods		21FLKWATWOODS3	WOODS IN SEMINOLE CO.	1993	2001	391
29979	LAKE	LAKE HOPE1 IN ORANGE C	3	21FLKWATHOPE3	LAKE HOPE3 IN ORANGE CO.	1995	2000	83
29979	LAKE	LAKE HOPE1 IN ORANGE C		21FLKWATHOPE1	LAKE HOPE1 IN ORANGE CO.	1995	2000	83
29979	LAKE	LAKE HOPE1 IN ORANGE C		21FLKWATHOPE2	LAKE HOPE2 IN ORANGE CO.	1995	2000	80
2997A	STREAM	HOWELL CREEK	3	21FLSJWMUSJ913	HOWELL BRANCH AT SR 436	1992	1993	39
2997A	STREAM	HOWELL CREEK		21FLORANHBC	HOWELL BRANCH AT HWY 436	1992	1998	452

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Jesup Planning Unit (continued)								
2997A	STREAM	HOWELL CREEK		21FLA 20010070	HOWELL CREEK AT OUTLET FRM L WAM	1993	1993	17
2997B	LAKE	HOWELL LAKE	9	21FLKWAT117HOWELL5		2000	2001	27
2997B	LAKE	HOWELL LAKE		21FLSJWMUSJ912	LAKE HOWELL AT CENTER	1992	1993	49
2997B	LAKE	HOWELL LAKE		21FLKWATHOWELL3	HOWELL IN SEMINOLE CO.	1992	2001	226
2997B	LAKE	HOWELL LAKE		21FLKWAT117HOWELL4		1999	2001	24
2997B	LAKE	HOWELL LAKE		21FLKWATHOWELL1	HOWELL IN SEMINOLE CO.	1992	2001	226
2997B	LAKE	HOWELL LAKE		21FLSEM HOW	HOWELL, LAKE	1998	2001	89
2997B	LAKE	HOWELL LAKE		21FLA 20010073	LK HOWELL CENTER	1996	1996	19
2997B	LAKE	HOWELL LAKE		21FLKWAT117HOWELL6		2000	2001	22
2997B	LAKE	HOWELL LAKE		21FLKWATHOWELL2	HOWELL IN SEMINOLE CO.	1992	2001	221
2997C	LAKE	LAKE MAITLAND	2	21FLORANHB24	LAKE MAITLAND	1992	1998	635
2997C	LAKE	LAKE MAITLAND		21FLA 20010316	L. MAITLAND - WINTER PARK	1996	1996	19
2997D	LAKE	LAKE MINNEHAHA	4	21FLORANHB26	LAKE MINNEHAHA	1992	1998	653
2997D	LAKE	LAKE MINNEHAHA		21FLKWAT095MINNEHAHA2		2001	2001	40
2997D	LAKE	LAKE MINNEHAHA		21FLKWAT095MINNEHAHA1		2001	2001	39
2997D	LAKE	LAKE MINNEHAHA		21FLKWAT095MINNEHAHA3		2001	2001	40
2997E	LAKE	LAKE OSCEOLA NORTH	3	21FLORANHB30	LAKE OSCEOLA	1992	1994	255
2997E	LAKE	LAKE OSCEOLA NORTH		21FLORANHB30M	LAKE OSCEOLA CENTER	1994	1998	456
2997E	LAKE	LAKE OSCEOLA NORTH		21FLORANHB30N	LAKE OSCEOLA N	1994	1998	454
2997F	LAKE	LAKE OSCEOLA SOUTH	1	21FLORANHB30S	LAKE OSCEOLA S	1994	1998	456
2997F	LAKE	LAKE IVANHOE	15	21FLKWATIVANHOE MIDDLE1	LAKE IVANHOE MIDDLE1 IN ORANGE CO.	1992	2001	415
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE WEST2	LAKE IVANHOE WEST2 IN ORANGE CO.	1993	2001	332
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE WEST1	LAKE IVANHOE WEST1 IN ORANGE CO.	1993	2001	334
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE MIDDLE3	LAKE IVANHOE MIDDLE3 IN ORANGE CO	1992	2001	415
2997F	LAKE	LAKE IVANHOE		21FLORL IVANHOE EAST	LAKE IVANHOE EAST CENTER OF LK	1993	1997	282
2997F	LAKE	LAKE IVANHOE		21FLORL IVANHOE MIDDLE	LAKE IVANHOE MIDDLE CENTER OF LK	1993	1997	285
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE WEST3	LAKE IVANHOE WEST3 IN ORANGE CO.	1993	2001	334
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE EAST3	LAKE IVANHOE EAST3 IN ORANGE CO.	1992	2001	374
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE EAST1	LAKE IVANHOE EAST1 IN ORANGE CO.	1992	2001	374
2997F	LAKE	LAKE IVANHOE		21FLA 20010336	LAKE IVANHOE-MIDDLE	1998	1998	17
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE MIDDLE2	LAKE IVANHOE MIDDLE2 IN ORANGE CO	1992	2001	415
2997F	LAKE	LAKE IVANHOE		21FLORL IVANHOE WEST	LAKE IVANHOE WEST CENTER OF LK	1993	1997	299
2997F	LAKE	LAKE IVANHOE		21FLORANHB20W	CENTER OF LAKE IVANHOE'S WEST LOBE	1992	1998	653
2997F	LAKE	LAKE IVANHOE		21FLORANHB20E	CENTER OF LAKE IVANHOE'S EAST LOBE	1992	1997	530
2997F	LAKE	LAKE IVANHOE		21FLKWATIVANHOE EAST2	LAKE IVANHOE EAST2 IN ORANGE CO.	1992	2001	377
2997G	LAKE	LAKE VIRGINIA	14	21FLORANHB39	LAKE VIRGINIA	1992	1998	666

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Jesup Planning Unit (continued)								
2997I	LAKE	LAKE SUE	4	21FLKWAT095SUE1		2001	2001	4
2997I	LAKE	LAKE SUE		21FLKWAT095SUE2		2001	2001	4
2997I	LAKE	LAKE SUE		21FLORANHB36	CENTER OF LAKE SUE	1992	1998	616
2997I	LAKE	LAKE SUE		21FLKWAT095SUE3		2001	2001	4
2997J	LAKE	LAKE ROWENA	5	21FLORANHB34	CENTER OF LAKE ROWENA	1992	1998	579
2997J	LAKE	LAKE ROWENA		21FLORL ROWENA	LAKE ROWENA	1993	1997	424
2997J	LAKE	LAKE ROWENA		21FLKWATROWENA1	LAKE ROWENA1 IN ORANGE CO.	1992	2001	213
2997J	LAKE	LAKE ROWENA		21FLKWATROWENA2	LAKE ROWENA2 IN ORANGE CO.	1992	2001	209
2997J	LAKE	LAKE ROWENA		21FLKWATROWENA3	LAKE ROWENA3 IN ORANGE CO.	1992	2001	213
2997K	LAKE	LAKE ESTELLE	8	21FLORL ESTELLE EAST	LAKE ESTELLE EAST CENTER	1993	1997	299
2997K	LAKE	LAKE ESTELLE		21FLKWATESTELLE EAST3	LAKE ESTELLE EAST3 IN ORANGE CO.	1992	2001	350
2997K	LAKE	LAKE ESTELLE		21FLKWATESTELLE3	LAKE ESTELLE3 IN ORANGE CO.	1992	2001	308
2997K	LAKE	LAKE ESTELLE		21FLKWATESTELLE EAST2	LAKE ESTELLE EAST2 IN ORANGE CO.	1992	2001	354
2997K	LAKE	LAKE ESTELLE		21FLKWATESTELLE2	LAKE ESTELLE2 IN ORANGE CO.	1992	2001	307
2997K	LAKE	LAKE ESTELLE		21FLKWATESTELLE1	LAKE ESTELLE1 IN ORANGE CO.	1992	2001	312
2997K	LAKE	LAKE ESTELLE		21FLORL ESTELLE WEST	LAKE ESTELLE WEST CENTER	1993	1997	299
2997K	LAKE	LAKE ESTELLE		21FLKWATESTELLE EAST1	LAKE ESTELLE EAST1 IN ORANGE CO.	1992	2001	356
2997L	LAKE	LAKE WINYAH	4	21FLORL WINYAH	LAKE WINYAH	1993	1997	299
2997L	LAKE	LAKE WINYAH		21FLKWATWINYAH3	LAKE WINYAH3 IN ORANGE CO.	1992	2001	268
2997L	LAKE	LAKE WINYAH		21FLKWATWINYAH1	LAKE WINYAH1 IN ORANGE CO.	1992	2001	263
2997L	LAKE	LAKE WINYAH		21FLKWATWINYAH2	LAKE WINYAH2 IN ORANGE CO.	1992	2001	265
2997M	LAKE	LAKE FORMOSA	5	21FLKWATFORMOSA3	LAKE FORMOSA3 IN ORANGE CO.	1992	2001	345
2997M	LAKE	LAKE FORMOSA		21FLORANHB11	CENTER OF LAKE FORMOSA	1992	1998	512
2997M	LAKE	LAKE FORMOSA		21FLKWATFORMOSA1	LAKE FORMOSA1 IN ORANGE CO.	1992	2001	344
2997M	LAKE	LAKE FORMOSA		21FLORL FORMOSA	LAKE FORMOSA	1993	1997	304
2997M	LAKE	LAKE FORMOSA		21FLKWATFORMOSA2	LAKE FORMOSA2 IN ORANGE CO.	1992	2001	346
2997N	LAKE	LAKE HIGHLAND	4	21FLKWATHIGHLAND2	LAKE HIGHLAND2 IN ORANGE CO.	1992	1996	67
2997N	LAKE	LAKE HIGHLAND		21FLKWATHIGHLAND1	LAKE HIGHLAND1 IN ORANGE CO.	1992	1996	67
2997N	LAKE	LAKE HIGHLAND		21FLORL HIGHLAND	LAKE HIGHLAND	1993	1997	302
2997N	LAKE	LAKE HIGHLAND		21FLKWATHIGHLAND3	LAKE HIGHLAND3 IN ORANGE CO.	1992	1996	67
2997O	LAKE	PARK LAKE	1	21FLORL PARK	PARK LAKE	1993	1997	286
2997P	LAKE	LAKE CONCORD	5	21FLORL CONCORD	LAKE CONCORD CENTER	1993	1997	298
2997P	LAKE	LAKE CONCORD		21FLKWATCONCORD3	LAKE CONCORD3 IN ORANGE CO.	1992	2001	227
2997P	LAKE	LAKE CONCORD		21FLORANHB7	GEOGRAPHICAL CENTER OF LAKE CONCORD	1994	1998	470
2997P	LAKE	LAKE CONCORD		21FLKWATCONCORD2	LAKE CONCORD2 IN ORANGE CO.	1992	2001	229
2997P	LAKE	LAKE CONCORD		21FLKWATCONCORD1	LAKE CONCORD1 IN ORANGE CO.	1992	2001	229

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Jesup Planning Unit (continued)								
2997Q	LAKE	LAKE DOT	4	21FLKWATDOT2	LAKE DOT2 IN ORANGE CO.	1992	2001	363
2997Q	LAKE	LAKE DOT		21FLKWATDOT3	LAKE DOT3 IN ORANGE CO.	1992	2001	364
2997Q	LAKE	LAKE DOT		21FLKWATDOT1	LAKE DOT1 IN ORANGE CO.	1992	2001	364
2997Q	LAKE	LAKE DOT		21FLORL DOT	LAKE DOT	1993	1997	354
2997R	LAKE	LAKE ADAIR	4	21FLKWATADAIR1	LAKE ADAIR1 IN ORANGE CO.	1992	2001	363
2997R	LAKE	LAKE ADAIR		21FLORL ADAIR	LAKE ADAIR CENTER	1993	1997	388
2997R	LAKE	LAKE ADAIR		21FLKWATADAIR2	LAKE ADAIR2 IN ORANGE CO.	1992	2001	363
2997R	LAKE	LAKE ADAIR		21FLKWATADAIR3	LAKE ADAIR3 IN ORANGE CO.	1992	2001	363
2997S	LAKE	LAKE SPRING	4	21FLKWATSPRING095-1-2	LAKE SPRING2 IN ORANGE CO.	1992	2001	83
2997S	LAKE	LAKE SPRING		21FLKWATSPRING095-1-3	LAKE SPRING3 IN ORANGE CO.	1992	2001	83
2997S	LAKE	LAKE SPRING		21FLORL SPRING	LAKE SPRING CENTER OF LK	1993	1996	237
2997S	LAKE	LAKE SPRING		21FLKWATSPRING095-1-1	LAKE SPRING1 IN ORANGE CO.	1992	2001	84
2997U	LAKE	LAKE PARK	4	21FLORANH32	LAKE PARK CENTER	1994	1998	481
2997U	LAKE	LAKE PARK		21FLKWATPARK3	LAKE PARK3 IN ORANGE CO.	1993	2001	320
2997U	LAKE	LAKE PARK		21FLKWATPARK2	LAKE PARK2 IN ORANGE CO.	1993	2001	322
2997U	LAKE	LAKE PARK		21FLKWATPARK1	LAKE PARK1 IN ORANGE CO.	1993	2001	322
2997W	LAKE	LAKE BELL	3	21FLKWATBELL095-2	LAKE BELL2 IN ORANGE CO.	1992	1999	229
2997W	LAKE	LAKE BELL		21FLKWATBELL095-3	LAKE BELL3 IN ORANGE CO.	1992	1999	227
2997W	LAKE	LAKE BELL		21FLKWATBELL095-1	LAKE BELL1 IN ORANGE CO.	1992	1999	229
2997X	LAKE	LAKE KILLARNEY	4	21FLKWATKILLARNEY1	LAKE KILLARNEY1 IN ORANGE CO.	1992	1995	89
2997X	LAKE	LAKE KILLARNEY		21FLKWATKILLARNEY2	LAKE KILLARNEY2 IN ORANGE CO.	1992	1995	87
2997X	LAKE	LAKE KILLARNEY		21FLORANH21	CENTER OF LAKE KILLARNEY	1992	1998	594
2997X	LAKE	LAKE KILLARNEY		21FLKWATKILLARNEY3	LAKE KILLARNEY3 IN ORANGE CO.	1992	1995	82
2997Y	LAKE	LAKE MIZELL	1	21FLORANH28	LAKE MIZELL	1992	1998	561
2999A	LAKE	LAKE HAYES	4	21FLSEM HAY	HAYES, LAKE	2000	2001	44
2999A	LAKE	LAKE HAYES		21FLKWATHAYES3	HAYES IN SEMINOLE CO.	1992	2001	177
2999A	LAKE	LAKE HAYES		21FLKWATHAYES1	HAYES IN SEMINOLE CO.	1992	2001	178
2999A	LAKE	LAKE HAYES		21FLKWATHAYES2	HAYES IN SEMINOLE CO.	1992	2001	180
2999B	LAKE	NONAME LAKE	3	21FLKWATNONAME3	NONAME IN SEMINOLE CO.	1992	1993	69
2999B	LAKE	NONAME LAKE		21FLKWATNONAME1	NONAME IN SEMINOLE CO.	1992	1993	66
2999B	LAKE	NONAME LAKE		21FLKWATNONAME2	NONAME IN SEMINOLE CO.	1992	1993	67
3009	LAKE	BEAR GULLEY LAKE	4	21FLKWAT117BEAR GULLY1		1999	2000	44
3009	LAKE	BEAR GULLEY LAKE	\	21FLKWAT117BEAR GULLY3		1999	2000	43
3009	LAKE	BEAR GULLEY LAKE		21FLKWAT117BEAR GULLY2		1999	2000	44
3009	LAKE	BEAR GULLEY LAKE		21FLSEM BGU	BEAR GULLY LAKE	1999	2001	84

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Jesup Planning Unit (continued)								
3009A	LAKE	WAUNATTA LAKE	4	21FLORANHB40	LAKE WAUNATTA	1994	1998	437
3009A	LAKE	WAUNATTA LAKE		21FLKWATWAUNATTA1	LAKE WAUNATTA1 IN ORANGE CO.	1993	2001	302
3009A	LAKE	WAUNATTA LAKE		21FLKWATWAUNATTA2	LAKE WAUNATTA2 IN ORANGE CO.	1993	2001	274
3009A	LAKE	WAUNATTA LAKE		21FLKWATWAUNATTA3	LAKE WAUNATTA3 IN ORANGE CO.	1993	2001	304
3009B	LAKE	LAKE MARTHA	3	21FLKWATMARTHA3	LAKE MARTHA3 IN ORANGE CO.	1994	1996	50
3009B	LAKE	LAKE MARTHA		21FLKWATMARTHA1	LAKE MARTHA1 IN ORANGE CO.	1994	1996	50
3009B	LAKE	LAKE MARTHA		21FLKWATMARTHA2	LAKE MARTHA2 IN ORANGE CO.	1994	1996	50
3009C	LAKE	LAKE BURKETT	4	21FLKWATBURKETT2	LAKE BURKETT2 IN ORANGE CO.	1994	2001	348
3009C	LAKE	LAKE BURKETT		21FLKWATBURKETT3	LAKE BURKETT3 IN ORANGE CO.	1994	2001	345
3009C	LAKE	LAKE BURKETT		21FLORANHB4	GEOGRAPHICAL CENTER OF LAKE BURKETT	1994	1998	494
3009C	LAKE	LAKE BURKETT		21FLKWATBURKETT1	LAKE BURKETT1 IN ORANGE CO.	1994	2001	348
3009D	LAKE	DEEP LAKE	4	21FLORANHB47	CENTER OF DEEP LAKE	1992	1998	571
3009D	LAKE	DEEP LAKE		21FLKWAT17DEEP2		2001	2001	12
3009D	LAKE	DEEP LAKE		21FLKWAT17DEEP1		2001	2001	12
3009D	LAKE	DEEP LAKE		21FLKWAT17DEEP3		2001	2001	12
3009E	LAKE	LAKE GEORGIA	4	21FLORANHB14	LAKE GEORGIA CENTER	1994	1998	407
3009E	LAKE	LAKE GEORGIA		21FLKWATGEORGIA1	LAKE GEORGIA1 IN ORANGE CO.	1992	2001	428
3009E	LAKE	LAKE GEORGIA		21FLKWATGEORGIA2	LAKE GEORGIA2 IN ORANGE CO.	1992	2001	412
3009E	LAKE	LAKE GEORGIA		21FLKWATGEORGIA3	LAKE GEORGIA3 IN ORANGE CO.	1992	2001	453
Lake Kerr Planning Unit – 13 Stations								
2894	LAKE	LAKE DELANCEY	1	21FLA 20030584	LAKE DELANCY CENTER	1998	1998	22
2899A	STREAM	HOPKINS PRAIRIE	1	21FLSJWMHP3	HOPKINS PRAIRIE SOUTH CENTRAL OPP. CAMPGROUND	1992	1993	1820
2899B	LAKE	LAKE KERR	1	21FLSJWMKER	LAKE KERR B/T KAUFFMANS ISL AND PT PLEASANT	1992	1998	1097
2900A	SPRING	SALT SPRINGS	2	1118ATL8050206	SALT SPRINGS REC AREA	1992	1997	54
2900A	SPRING	SALT SPRINGS		1118ATL8050205	SALT SPRINGS REC AREA	1992	1997	53
2905	STREAM	JUNIPER CREEK	4	21FLCEN 20010454	Juniper Creek 100 yards upstream of Highway 19	1999	1999	13
2905	STREAM	JUNIPER CREEK		21FLSJWMJUNRUN	JUNIPER CREEK AT HWY 19	1993	1993	121
2905	STREAM	JUNIPER CREEK		1118ATL8050207	JUNIPER SPRINGS REC AREA	1992	1997	74
2905	STREAM	JUNIPER CREEK		21FLA 20010454	JUNIPER CREEK AT HIGHWAY 19	1992	1996	162
2905A	SPRING	JUNIPER SPRING	1	21FLSJWMJUN	JUNIPER SPRINGS AT BOIL	1992	1997	230
2905C	LAKE	WILDCAT LAKE	3	21FLKWATWILDCAT2	LAKE WILDCAT2 IN LAKE CO.	1992	2000	137
2905C	LAKE	WILDCAT LAKE		21FLKWATWILDCAT1	LAKE WILDCAT1 IN LAKE CO.	1992	2000	136
2905C	LAKE	WILDCAT LAKE		21FLKWATWILDCAT3	LAKE WILDCAT3 IN LAKE CO.	1992	2000	136

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Monroe Planning Unit = 105 Stations								
2893	SPRING	GEMINI SPRINGS NR DEBA	3	21FLKWATGEMINISPRINGS2		1992	1992	3
2893	SPRING	GEMINI SPRINGS NR DEBA		21FLKWATGEMINISPRINGS3		1992	1992	3
2893	SPRING	GEMINI SPRINGS NR DEBA		21FLKWATGEMINISPRINGS1		1992	1992	3
2893C	STREAM	STJ RIV AB WEKIVA R.	8	21FLVEMDSJ13	ST. JOHNS RIVER AT CM 101	1992	1998	1710
2893C	STREAM	STJ RIV AB WEKIVA R.		21FLVEMDSJ12	ST. JOHNS RIVER AT U.S. HWY 17-92	1992	1998	1258
2893C	STREAM	STJ RIV AB WEKIVA R.		21FLVEMDVC-051	St. John's River, at CM 101	1999	2001	238
2893C	STREAM	STJ RIV AB WEKIVA R.		21FLVEMDVC-050	St. John's River, between U.S. 17-92 and I-4	1999	2001	253
2893C	STREAM	STJ RIV AB WEKIVA R.		112WRD 02234500	ST. JOHNS RIVER NR SANFORD, FLA.	2000	2000	360
2893C	STREAM	STJ RIV AB WEKIVA R.		21FLGFWFCCR0197	ST. JOHNS RIVER 1/2 MILE SOUTH OF WEKIVA RIVER	1992	1996	343
2893C	STREAM	STJ RIV AB WEKIVA R.		21FLSJWM20010003	ST. JOHNS RIVER AT US HWY 17-92	1995	2001	1510
2893C	STREAM	STJ RIV AB WEKIVA R.		21FLA 20010003	ST. JOHNS RIVER AT US HWYS 17-19	1992	1995	273
2893D	LAKE	LAKE MONROE	14	21FLVEMDVC-049	St. John's River, at Lake Monroe, at CM R10	1999	2001	263
2893D	LAKE	LAKE MONROE	33	21FLVEMDVC-047	St. John's River, S. end of Lake Monroe, at CM R4	1999	2001	244
2893D	LAKE	LAKE MONROE	33	21FLVEMDSJ11	LAKE MONROE AT CHANNEL MARKER R10	1992	1998	1615
2893D	LAKE	LAKE MONROE	33	21FLVEMDSJ10	LAKE MONROE - CENTER OF THE LAKE	1992	1998	1638
2893D	LAKE	LAKE MONROE	33	21FLVEMDSJ09	SOUTH END OF LAKE MONROE AT CM R4	1992	1998	1310
2893D	LAKE	LAKE MONROE	33	21FLKWAT117MONROE WEST3		2000	2001	56
2893D	LAKE	LAKE MONROE	33	21FLKWAT117MONROE EAST3		2000	2001	46
2893D	LAKE	LAKE MONROE	33	21FLVEMDVC-048	St. John's River, at center of Lake Monroe	1999	2001	253
2893D	LAKE	LAKE MONROE	33	21FLGFWFCCR0178	LAKE MONROE AT BOAT RAMP ON US 17-92	1992	1996	342
2893D	LAKE	LAKE MONROE	33	21FLKWAT117MONROE WEST2		2000	2001	56
2893D	LAKE	LAKE MONROE	33	21FLSJWMLMAC	LAKE MONROE AT CENTER	1992	2001	1800
2893D	LAKE	LAKE MONROE	33	21FLKWAT117MONROE WEST1		2000	2001	55
2893D	LAKE	LAKE MONROE	33	21FLKWAT117MONROE EAST2		2000	2001	48
2893D	LAKE	LAKE MONROE	33	21FLKWAT117MONROE EAST1		2000	2001	48
2893E	STREAM	STJ RIV AB LK MONROE	2	21FLSJWMMOW-SJR-2	MIDDLE OF ST. JOHNS RIVER NO OF LK JESUP	1996	1997	692
2893E	STREAM	STJ RIV AB LK MONROE		21FLVEMDSJ08	ST. JOHNS RIVER SOUTH OF S.R. 415 BRIDGE	1992	1998	1469
2893G	LAKE	GLEASON LAKE	3	21FLKWATGLEASON3	GLEASON IN VOLUSIA CO.	1992	1992	9
2893G	LAKE	GLEASON LAKE		21FLKWATGLEASON2	GLEASON IN VOLUSIA CO.	1992	1992	12
2893G	LAKE	GLEASON LAKE		21FLKWATGLEASON1	GLEASON IN VOLUSIA CO.	1992	1992	12

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Monroe Planning Unit (continued)								
2938A	LAKE	LAKE HELEN	3	21FLKWATHELEN3	HELEN IN VOLUSIA CO.	1992	2001	156
2938A	LAKE	LAKE HELEN		21FLKWATHELEN1	HELEN IN VOLUSIA CO.	1992	2001	156
2938A	LAKE	LAKE HELEN		21FLKWATHELEN2	HELEN IN VOLUSIA CO.	1992	2001	156
2938B	LAKE	DUPONT LAKE	4	21FLKWAT127DUPONTSOUTH1		1996	1998	97
2938B	LAKE	DUPONT LAKE		21FLKWAT127DUPONTSOUTH2		1996	1998	92
2938B	LAKE	DUPONT LAKE		21FLSJWMDUPLK	DUPONT LAKE OFF HOLAND BLVD	1993	1993	51
2938B	LAKE	DUPONT LAKE		21FLKWAT127DUPONTSOUTH3		1996	1998	95
2951	LAKE	LAKE MARIE	3	21FLKWATMARIE2	MARIE IN VOLUSIA CO.	1995	1997	88
2951	LAKE	LAKE MARIE		21FLKWATMARIE3	MARIE IN VOLUSIA CO.	1995	1997	88
2951	LAKE	LAKE MARIE		21FLKWATMARIE1	MARIE IN VOLUSIA CO.	1995	1997	88
2953	LAKE	BETHEL LAKE	3	21FLKWATBETHEL3	BETHEL IN VOLUSIA CO.	1992	2001	103
2953	LAKE	BETHEL LAKE		21FLKWATBETHEL1	BETHEL IN VOLUSIA CO.	1992	2001	102
2953	LAKE	BETHEL LAKE		21FLKWATBETHEL2	BETHEL IN VOLUSIA CO.	1992	2001	117
2953A	LAKE	BROKEN ARROW LAKE	3	21FLKWATBROKEN ARROW1	BROKEN ARROW IN VOLUSIA CO.	1992	2001	303
2953A	LAKE	BROKEN ARROW LAKE		21FLKWATBROKEN ARROW2	BROKEN ARROW IN VOLUSIA CO.	1992	2001	303
2953A	LAKE	BROKEN ARROW LAKE		21FLKWATBROKEN ARROW3	BROKEN ARROW IN VOLUSIA CO.	1992	2001	303
2953B	LAKE	BIG LAKE	6	21FLKWAT127BIG2		2000	2001	100
2953B	LAKE	BIG LAKE		21FLCEN 20010125	Wekiva River 0.5 miles from St. Johns River	1999	1999	26
2953B	LAKE	BIG LAKE		21FLKWAT127BIG1		2000	2001	100
2953B	LAKE	BIG LAKE		21FLCEN 20010126	Big Wekiva River downstream of Little Wekiva	1999	1999	26
2953B	LAKE	BIG LAKE		21FLSJWMBIGLK	BIG LAKE OFF DOYLE ROAD (DELTONA)	1993	1993	101
2953B	LAKE	BIG LAKE		21FLKWAT127BIG3		2000	2001	100
2962	STREAM	SMITH CANAL	3	21FLSJWMUSJ905	SMITH CANAL AT ORANGE BLVD	1992	1993	38
2962	STREAM	SMITH CANAL		21FLSEM SMI	LOCKHART SMITH CANAL	2000	2001	45
2962	STREAM	SMITH CANAL		21FLCEN 20010647	Smith Canal at Orange Boulevard Bridge	1999	1999	9
2962A	LAKE	EAST TWIN LAKE	6	21FLKWAT117TWIN EAST2		1997	1998	19
2962A	LAKE	EAST TWIN LAKE		21FLKWAT117TWIN EAST3		1997	1998	19
2962A	LAKE	EAST TWIN LAKE		21FLKWAT117TWIN EAST1		1997	1998	20
2962A	LAKE	EAST TWIN LAKE		21FLKWATEAST TWIN3	EAST TWIN IN SEMINOLE CO.	1993	1993	12
2962A	LAKE	EAST TWIN LAKE		21FLKWATEAST TWIN2	EAST TWIN IN SEMINOLE CO.	1993	1993	12
2962A	LAKE	EAST TWIN LAKE		21FLKWATEAST TWIN1	EAST TWIN IN SEMINOLE CO.	1993	1993	12
2962B	LAKE	ADA LAKE	3	21FLKWAT117ADA3		1997	2001	110
2962B	LAKE	ADA LAKE		21FLKWAT117ADA2		1997	2001	114
2962B	LAKE	ADA LAKE		21FLKWAT117ADA1		1997	2001	112
2962D	LAKE	LAKE MARY	3	21FLKWATMARY117-1	MARY IN SEMINOLE CO.	1992	2001	302
2962D	LAKE	LAKE MARY		21FLKWATMARY117-2	MARY IN SEMINOLE CO.	1992	2001	287

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Monroe Planning Unit (continued)								
2962D	LAKE	LAKE MARY		21FLKWATMARY117-3	MARY IN SEMINOLE CO.	1992	2001	270
2962E	LAKE	LITTLE LAKE MARY	3	21FLKWATLITTLE MARY LK1	LITTLE MARY IN SEMINOLE CO.	1992	2000	181
2962E	LAKE	LITTLE LAKE MARY		21FLKWATLITTLE MARY LK2	LITTLE MARY IN SEMINOLE CO.	1992	2000	182
2962E	LAKE	LITTLE LAKE MARY		21FLKWATLITTLE MARY LK3	LITTLE MARY IN SEMINOLE CO.	1992	2000	175
2973	LAKE	DEFOREST LAKE OUTLET	4	21FLSEM CL02	DEFOREST LAKE	1997	2001	166
2973	LAKE	DEFOREST LAKE OUTLET		21FLKWAT117DEFOREST3		1996	1997	24
2973	LAKE	DEFOREST LAKE OUTLET		21FLKWAT117DEFOREST1		1996	1997	24
2973	LAKE	DEFOREST LAKE OUTLET		21FLKWAT117DEFOREST2		1996	1997	24
2973A	LAKE	LAKE EMMA	3	21FLKWATEMMA LAKE2	EMMA IN SEMINOLE CO.	1992	1992	3
2973A	LAKE	LAKE EMMA		21FLKWATEMMA LAKE3	EMMA IN SEMINOLE CO.	1992	1992	3
2973A	LAKE	LAKE EMMA		21FLKWATEMMA LAKE1	EMMA IN SEMINOLE CO.	1992	1992	3
2973B	LAKE	WEST CRYSTAL LAKE	3	21FLKWATWEST CRYSTAL3	WEST CRYSTAL IN SEMINOLE CO.	1992	1997	79
2973B	LAKE	WEST CRYSTAL LAKE		21FLKWATWEST CRYSTAL2	WEST CRYSTAL IN SEMINOLE CO.	1992	1997	83
2973B	LAKE	WEST CRYSTAL LAKE		21FLKWATWEST CRYSTAL1	WEST CRYSTAL IN SEMINOLE CO.	1992	1997	72
2973C	LAKE	EAST CRYSTAL LAKE	4	21FLKWATEAST CRYSTAL2	EAST CRYSTAL IN SEMINOLE CO.	1992	2000	393
2973C	LAKE	EAST CRYSTAL LAKE		21FLKWATEAST CRYSTAL3	EAST CRYSTAL IN SEMINOLE CO.	1992	2000	387
2973C	LAKE	EAST CRYSTAL LAKE		21FLKWATEAST CRYSTAL1	EAST CRYSTAL IN SEMINOLE CO.	1992	2000	373
2973C	LAKE	EAST CRYSTAL LAKE		21FLSEM CL03	EAST CRYSTAL LAKE	1997	2001	146
2981A	LAKE	LAKE JESSUP NR STJR	21	21FLSJRWOW-1	SJR in Government Cut N of Lk Jesup & SR46	1995	2000	1236
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWOW-6	L JESUP IN 4FT HOLE OFF CENTER OF FAR WEST ARM	1995	1997	1204
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-5	HOWELL CREEK DELTA ON SW END OF LAKE JESUP	1995	1997	981
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-4	SWEETWATER CK @ W END OF PALM AVE E END L JESUP	1995	1997	1036
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-3	SIX MI CREEK @ SANFORD AVE CANAL NW OF L JESUP	1995	1997	709
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-2	SALT CREEK DELTA ON UPPER EST SIDE OF L JESUP	1995	1997	731
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-13	CHUB CK DELTA INSIDE NAKED PL NE END L JESUP	1995	1997	623
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-12	PHHELPS CK DELTA @ PINEWAY RD OFF N SIDE L JESUP	1995	1997	735
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-6	HOWELL CREEK @ SR434 S OF WHITES LODGE L JESUP	1995	1997	709
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWOW-7	L JESUP IN 5FT HOLE B/T MARL BED PT & LONG PT	1995	1997	818

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Monroe Planning Unit (continued)								
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMOW-2	LAKE JESUP IN 4FT HOLE OFF GRASSY PT	1995	1997	808
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMOW-5	L JESUP IN 10FT HOLE B/T CALDWELL & NEW BALL FLD	1995	1997	1237
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMOW-4	LAKE JESUP IN 10FT HOLE B/T WHITES LDG & BIRD IS	1995	1997	911
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMOW-3	LAKE JESUP IN 7FT HOLE B/T SEEVEE IS. AND LOG PT	1995	1997	808
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMOW-1	ST. JOHNS R IN GOV'T CUT N OF L JESUP	1995	1997	888
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-10	SOLDIER CK AT SR419 OFF W END LAKE JESUP	1995	1997	686
2981A	LAKE	LAKE JESSUP NR STJR		21FLSEM JES	JESUP, LAKE	1998	2001	72
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-1	ROTTEN EGG SLOUGH ON EAST SIDE OF LAKE JESUP	1995	1997	728
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-9	GEE CK @ SR419 OFF SW END OF L JESUP	1995	1997	710
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-8	GEE CK & SOLDIER CK DELTA WEST END L JESUP	1995	1997	1091
2981A	LAKE	LAKE JESSUP NR STJR		21FLSJWMT-7	SWEETWATER CK @ DeLEON & CRESS RUN S OF L JESUP	1995	1997	1029
Lake Woodruff Planning Unit = 42 Stations								
28933	SPRING	BLUE SPRING (Volusia)	2	21FLGW 9673	BLUE SPRING (VOLUSIA)	2001	2001	17
28933	SPRING	BLUE SPRING (Volusia)		112WRD 02235500	BLUE SPRINGS NR ORANGE CITY FLA	1992	2000	294
2893B	STREAM	STJ RIV AB LK WOODRUFF	17	21FLVEMDVC-059	St. John's River, at CM 26	1999	2001	263
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDSJ15	ST. JOHNS RIVER AT CM 93	1992	1998	1479
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDSJ16	ST. JOHNS RIVER AT CM 69	1992	1998	1780
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDSJ18	ST. JOHNS RIVER AT CM 53	1992	1998	1234
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDSJ19	ST. JOHNS RIVER 50 YDS. S OF S.R. 44 BRIDGE	1992	1998	1948
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDSJ20	ST. JOHNS RIVER AT CM 39	1992	1998	1585
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDVC-057	St. John's River, about 50 yds. S. of S.R. 44	1999	2001	275
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDVC-060	St. John's River, at CM 16	1999	2001	251
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDVC-056	St. John's River, at CM 53	1999	2001	250

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Woodruff Planning Unit (continued)								
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLGFWFGCCR0199	ST. JOHNS RIVER NORTH OF WEKIVA RIVER AT CM 93	1992	1996	324
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDVC-058	St. John's River, at CM 39	1999	2001	251
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDSJ21	ST. JOHNS RIVER AT CM 26	1992	1998	1662
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDVC-054	St. John's River, at CM 69	1999	2001	252
2893B	STREAM	STJ RIV AB LK WOODRUFF		112WRD 02236000	ST. JOHNS RIVER NR DELAND, FLA.	1992	2000	805
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLSJWMBLSPR	BL SPR RUN 200 YD DNSTRM OF SPR HEAD	1994	1998	986
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLSJWM02236000	ST. JOHNS RIVER NEAR DeLAND	1995	1998	812
2893B	STREAM	STJ RIV AB LK WOODRUFF		21FLVEMDSJ22	ST. JOHNS RIVER AT CM 16	1992	1998	1231
2893U	LAKE	LAKE BERESFORD	5	21FLKWATBERESFORD2	BERESFORD IN VOLUSIA CO.	1992	2001	422
2893U	LAKE	LAKE BERESFORD		21FLVEMDVC-055	St. John's River, center of Lake Beresford	1999	2001	256
2893U	LAKE	LAKE BERESFORD		21FLKWATBERESFORD3	BERESFORD IN VOLUSIA CO.	1992	2001	421
2893U	LAKE	LAKE BERESFORD		21FLKWATBERESFORD1	BERESFORD IN VOLUSIA CO.	1992	2001	424
2893U	LAKE	LAKE BERESFORD		21FLVEMDSJ17	LAKE BERESFORD - CENTER OF THE LAKE	1992	1998	1452
2893Z	STREAM	STJ RIV AB LAKE GEORGE	2	21FLVEMDSJ26	ST. JOHNS RIVER AT CM 8	1992	1998	1560
2893Z	STREAM	STJ RIV AB LAKE GEORGE		21FLVEMDVC-064	St. John's River, at CM 8	1999	2001	275
2912A	LAKE	LAKE EMPORIA	3	21FLKWATEMPORIA3	EMPORIA IN VOLUSIA CO.	1992	1999	316
2912A	LAKE	LAKE EMPORIA		21FLKWATEMPORIA2	EMPORIA IN VOLUSIA CO.	1992	1999	315
2912A	LAKE	LAKE EMPORIA		21FLKWATEMPORIA1	EMPORIA IN VOLUSIA CO.	1992	1999	309
2921	LAKE	LAKE WOODRUFF	10	21FLSJWMLKWOOD	LAKE WOODRUFF AT CENTER	1992	1998	766
2921	LAKE	LAKE WOODRUFF		21FLVEMDVC-062	St. John's River, center of Lake Woodruff	1999	2001	238
2921	LAKE	LAKE WOODRUFF		21FLSJWMLSJ009	SPRING GARDEN LAKE AT CENTER	1992	1993	38
2921	LAKE	LAKE WOODRUFF		21FLKWATSPRING GARDEN2	SPRING GARDEN IN VOLUSIA CO.	1992	2001	310
2921	LAKE	LAKE WOODRUFF		21FLVEMDSJ24	LAKE WOODRUFF - CENTER OF THE LAKE	1992	1998	1249
2921	LAKE	LAKE WOODRUFF		21FLKWATSPRING GARDEN1	SPRING GARDEN IN VOLUSIA CO.	1992	2001	311
2921	LAKE	LAKE WOODRUFF		21FLKWATSPRING GARDEN3	SPRING GARDEN IN VOLUSIA CO.	1992	2001	311
2921	LAKE	LAKE WOODRUFF		21FLA 20010123	SPRING GARDEN LAKE, CENTER	1992	1992	1
2921	LAKE	LAKE WOODRUFF		21FLVEMDSJ23	SPRING GARDEN LAKE - CENTER OF THE LAKE	1992	1998	1181

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Lake Woodruff Planning Unit (continued)								
2921	LAKE	LAKE WOODRUFF		21FLVEMDSJ25	LAKE DEXTER - CENTER OF THE LAKE	1992	1998	1229
2921B	LAKE	LAKE TEDDER	3	21FLKWATTEDDER3	TEDDER IN VOLUSIA CO.	1992	1992	2
+2921B	LAKE	LAKE TEDDER		21FLKWATTEDDER2	TEDDER IN VOLUSIA CO.	1992	1992	2
2921B	LAKE	LAKE TEDDER		21FLKWATTEDDER1	TEDDER IN VOLUSIA CO.	1992	1992	2
Wekiva River Planning Unit = 177 Stations								
2929A	STREAM	BLACK WATER CREEK	0	21FLLGPCBWSMWMMA	BLACK WATER CREEK @ BRIDGE IN SEMINOLE WMA	1999	1999	12
2929A	STREAM	BLACK WATER CREEK		112WRD 02235200	BLACKWATER CREEK NEAR CASSIA, FL	2000	2000	73
2929A	STREAM	BLACK WATER CREEK		21FLLPCBWCNOR	BLACKWATER CREEK @ LAKE NORRIS RD	1996	1999	161
2929A	STREAM	BLACK WATER CREEK		21FLSJWMBWCPCB	BLACKWATER CREEK AT CARTER PROP BRIDGE	1992	2001	1786
2929A	STREAM	BLACK WATER CREEK		21FLCEN 20010455	Blackwater Creek 100 yards upstream of Highway 44A	1999	2001	41
2929A	STREAM	BLACK WATER CREEK		21FLCEN 20010323	Blackwater Creek at Lake Norris Road	2001	2001	5
2929A	STREAM	BLACK WATER CREEK		21FLA 20010479	BLACKWATER CR. 1.4 MI NO OF SR42	1992	1992	11
2929A	STREAM	BLACK WATER CREEK		21FLA 20010455	BLACKWATER CREEK AT HWY 44A	1992	1996	139
2929A	STREAM	BLACK WATER CREEK		21FLSJWMBWC44	BLACKWATER CREEK AT SR 44	1992	2001	1776
2929B	LAKE	LAKE NORRIS	5	21FLSJWMSJ016	LAKE NORRIS SOUTH END	1992	1993	29
2929B	LAKE	LAKE NORRIS		21FLSJWMSJ015	LAKE NORRIS NORTH END	1992	1993	37
2929B	LAKE	LAKE NORRIS		21FLKWAT069NORRIS3		1998	1999	34
2929B	LAKE	LAKE NORRIS		21FLKWAT069NORRIS1		1998	1999	34
2929B	LAKE	LAKE NORRIS		21FLKWAT069NORRIS2		1998	1999	34
2929C	LAKE	LAKE DORR	3	21FLKWATDORR1	LAKE DORR1 IN LAKE CO.	1992	2001	350
2929C	LAKE	LAKE DORR		21FLKWATDORR3	LAKE DORR3 IN LAKE CO.	1992	2001	350
2929C	LAKE	LAKE DORR		21FLKWATDORR2	LAKE DORR2 IN LAKE CO.	1992	2001	350
2929D	LAKE	LITTLE LAKE MARY	3	21FLKWATLITTLE MARY3	LAKE LITTLE MARY3 IN LAKE CO.	1992	1993	58
2929D	LAKE	LITTLE LAKE MARY		21FLKWATLITTLE MARY2	LAKE LITTLE MARY2 IN LAKE CO.	1992	1993	58
2929D	LAKE	LITTLE LAKE MARY		21FLKWATLITTLE MARY1	LAKE LITTLE MARY1 IN LAKE CO.	1992	1993	58
2949	LAKE	LAKE DALHOUSE OUTLET	1	21FLA 20010010	LAKE DALHOUSE - CENTER OF LAKE	1995	1996	36
2956	STREAM	WEKIVA RIVER	7	21FLCEN 20010377	Big Wekiva River at Wekiva Marina	1999	1999	26
2956	STREAM	WEKIVA RIVER		21FLORANBWB	WEKIVA R. AT WEKIWA MARINA	1992	1997	417
2956	STREAM	WEKIVA RIVER		21FLCEN 20010431	Wekiva River 50 m upstream of confluence with Rock	1999	1999	26
2956	STREAM	WEKIVA RIVER		21FLA 20010103	Big Wekiva River upstream of Little Wekiva	1997	1997	19
2956	STREAM	WEKIVA RIVER		112WRD 02234635	WEKIVA RIVER NR APOPKA, FLA.	2000	2000	47
2956	STREAM	WEKIVA RIVER		21FLCEN 20010103	Big Wekiva River upstream of Little Wekiva	1999	1999	26

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Wekiva River Planning Unit (continued)								
2956	STREAM	WEKIVA RIVER		21FLA 20010377	BIG WEKIVA RIV AT WEKIVA MARINA	1992	1992	11
2956A	STREAM	WEKIVA RIVER	9	21FLCEN 20010438	Wekiva River upstream of Blackwater Creek	1999	1999	26
2956A	STREAM	WEKIVA RIVER		21FLSJWM02235000	WEKIVA RIVER NEAR SANFORD	1995	1998	513
2956A	STREAM	WEKIVA RIVER		21FLORANBWC	WEKIVA R. AT SR46	1992	1997	446
2956A	STREAM	WEKIVA RIVER		112WRD 02235000	WEKIVA RIVER NR SANFORD, FLA.	2000	2000	73
2956A	STREAM	WEKIVA RIVER		21FLKWATWEKIVARIVERLO11		2001	2001	16
2956A	STREAM	WEKIVA RIVER		21FLKWATWEKIVARIVERLO21		2001	2001	16
2956A	STREAM	WEKIVA RIVER		21FLKWATWEKIVARIVERLO31		2001	2001	16
2956A	STREAM	WEKIVA RIVER		21FLSJWWMR46	WEKIVA RIVER AT CENTER 50 M DNSTR OF SR 46	1992	1995	357
2956A	STREAM	WEKIVA RIVER		21FLA 20010126	Big Wekiva River downstream of Little Wekiva	1997	1997	19
2956A1	LAKE	LINDEN LAKE	1	21FLSEM LIND	LINDEN LAKE	1999	2001	46
2956B	STREAM	WEKIVA RIVER LOWER	3	21FLVEMDSJ14	WEKIVA RIVER 1 MI. UPSTREAM FROM ST. JOHNS	1992	1998	1925
2956B	STREAM	WEKIVA RIVER LOWER		21FLA 20010125	WEKIVA RIVER 0.5 MILES FROM ST JOHNS RIVER	1993	1995	137
2956B	STREAM	WEKIVA RIVER LOWER		21FLGWFVFGCCR0196	WEKIVA RIVER PAST FIRST SHARP TURN TO RIGHT	1992	1996	325
2956C	SPRING	WEKIVA SPRING (Orange)	1	21FLORANBW82	WAKIVA SPRINGS	1994	1998	301
2956F	LAKE	LAKE BRANTLEY	4	21FLKWATBRANTLEY2	BRANTLEY IN SEMINOLE CO.	1994	2000	111
2956F	LAKE	LAKE BRANTLEY		21FLCEN 20010280	Lake Brantley at center	1999	1999	14
2956F	LAKE	LAKE BRANTLEY		21FLKWATBRANTLEY1	BRANTLEY IN SEMINOLE CO.	1994	2000	111
2956F	LAKE	LAKE BRANTLEY		21FLKWATBRANTLEY3	BRANTLEY IN SEMINOLE CO.	1994	2000	110
2961	LAKE	LAKE SYLVAN	4	21FLKWAT17SYLVAN3		1998	1999	44
2961	LAKE	LAKE SYLVAN		21FLKWAT17SYLVAN2		1998	1999	45
2961	LAKE	LAKE SYLVAN		21FLKWAT17SYLVAN1		1998	1999	44
2961	LAKE	LAKE SYLVAN		21FLSEM SYL	SYLVAN LAKE	1998	2001	80
2967	SPRING	ROCK SPRINGS RUN	3	21FLSJWWMUSJ904	ROCK SPRINGS RUN NEAR MOUTH	1992	1992	29
2967	SPRING	ROCK SPRINGS RUN		21FLCEN 20010342	Rock Springs Run 50 meters upstream of Wekiva Rive	1999	1999	25
2967	SPRING	ROCK SPRINGS RUN		21FLORANBWA	ROCK SPRINGS RUN	1992	1998	581
2970	LAKE	LAKE MARKHAM	1	21FLSEM MRK	MARKHAM, LAKE	1998	2001	82
2987	STREAM	LITTLE WEKIVA RIVER	8	21FLSEM WET	LITTLE WEKIVA RIVER	2000	2001	48
2987	STREAM	LITTLE WEKIVA RIVER		21FLCEN 20010343	Little Wekiva River 50m upstream of Big Wekiva Riv	1999	1999	26
2987	STREAM	LITTLE WEKIVA RIVER		112WRD 02234990	LITTLE WEKIVA RIVER NR ALTAMONTE SPRINGS, FL	1994	2000	92
2987	STREAM	LITTLE WEKIVA RIVER		21FLA 20010102	LITTLE WEKIVA RIVER AT BETSY LANE OFF DELK ROAD	1997	1997	29
2987	STREAM	LITTLE WEKIVA RIVER		21FLA 20010137	LIT WEKIVA RIVER AT SR 434	1993	1998	518

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Wekiva River Planning Unit (continued)								
2987	STREAM	LITTLE WEKIVA RIVER		21FLSJWM20010137	LITTLE WEKIVA RIVER AT HWY 434	1995	2001	1174
2987	STREAM	LITTLE WEKIVA RIVER		21FLSEM LWK	LITTLE WEKIVA RIVER	1998	2001	82
2987	STREAM	LITTLE WEKIVA RIVER		21FLSJWMLWR434	LITTLE WEKIVA RIVER AT/NEAR SR 434	1993	1995	248
2987A	LAKE	SPRING LAKE	4	21FLSEM SPR	SPRING LAKE	1999	2001	75
2987A	LAKE	SPRING LAKE		21FLKWAT117SPRING1		1992	2001	323
2987A	LAKE	SPRING LAKE		21FLKWAT117SPRING2		1992	2001	320
2987A	LAKE	SPRING LAKE		21FLKWAT117SPRING3		1992	2001	323
2993A	LAKE	DREAM LAKE	3	21FLKWATDREAM2	LAKE DREAM2 IN ORANGE CO.	1992	1992	16
2993A	LAKE	DREAM LAKE		21FLKWATDREAM1	LAKE DREAM1 IN ORANGE CO.	1992	1992	16
2993A	LAKE	DREAM LAKE		21FLKWATDREAM3	LAKE DREAM3 IN ORANGE CO.	1992	1992	16
2998	LAKE	CRANES ROOST OUTLET	3	21FLKWATCRANES ROOST1	CRANES ROOST IN SEMINOLE CO.	1995	2001	270
2998	LAKE	CRANES ROOST OUTLET		21FLKWATCRANES ROOST2	CRANES ROOST IN SEMINOLE CO.	1995	2001	274
2998	LAKE	CRANES ROOST OUTLET		21FLKWATCRANES ROOST3	CRANES ROOST IN SEMINOLE CO.	1995	2001	268
2998A	LAKE	LAKE FLORIDA	3	21FLKWAFLORIDA3	FLORIDA IN SEMINOLE CO.	1995	2001	282
2998A	LAKE	LAKE FLORIDA		21FLKWAFLORIDA1	FLORIDA IN SEMINOLE CO.	1995	2001	291
2998A	LAKE	LAKE FLORIDA		21FLKWAFLORIDA2	FLORIDA IN SEMINOLE CO.	1995	2001	285
2998B	LAKE	LAKE MOBILE	3	21FLKWATADELAIDE1	ADELAIDE LAKE IN SEMINOLE CO.	1992	2001	243
2998B	LAKE	LAKE MOBILE		21FLKWATADELAIDE2	ADELAIDE IN SEMINOLE CO.	1992	2001	243
2998B	LAKE	LAKE MOBILE		21FLKWATADELAIDE3	ADELAIDE IN SEMINOLE CO.	1992	2001	243
2998C	LAKE	LAKE ORIENTA	12	21FLKWATORIENTA 13	ORIENTA 1 IN SEMINOLE CO.	1995	2001	204
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA 22	ORIENTA 2 IN SEMINOLE CO.-SEE NOTE	1995	2001	203
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA 23	ORIENTA 2 IN SEMINOLE CO.	1995	2001	203
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA EAST1	ORIENTA EAST IN SEMINOLE CO.	1995	2001	176
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA EAST2	ORIENTA EAST IN SEMINOLE CO.	1995	2001	176
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA 12	ORIENTA 1 IN SEMINOLE CO.	1995	2001	204
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA NORTH1	ORIENTA NORTH IN SEMINOLE CO.	1995	2001	175
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA 21	ORIENTA 2 IN SEMINOLE CO.	1995	2001	201
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA NORTH2	ORIENTA NORTH IN SEMINOLE CO.	1995	2001	176
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA NORTH3	ORIENTA NORTH IN SEMINOLE CO.	1995	2001	176
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA EAST3	ORIENTA EAST IN SEMINOLE CO.	1995	2001	176
2998C	LAKE	LAKE ORIENTA		21FLKWATORIENTA 11	ORIENTA 1 IN SEMINOLE CO.	1995	2001	204
3000	LAKE	LAKE PEARL	1	21FLORANHB33	LAKE PEARL CENTER	1994	1998	441
3000A	LAKE	LAKE HARRIET	1	21FLSEM HAR	HARRIET, LAKE	1999	2001	46
3000B	LAKE	LAKE YVONNE	3	21FLKWATYVONNE3	YVONNE IN SEMINOLE CO.	1995	1997	24
3000B	LAKE	LAKE YVONNE		21FLKWATYVONNE2	YVONNE IN SEMINOLE CO.	1995	1997	24
3000B	LAKE	LAKE YVONNE		21FLKWATYVONNE1	YVONNE IN SEMINOLE CO.	1995	1997	24

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Wekiva River Planning Unit (continued)								
3000C	LAKE	MIRROR LAKE	4	21FLSEM MIR	MIRROR LAKE	1998	2001	72
3000C	LAKE	MIRROR LAKE		21FLKWAT117MIRROR3		1994	1994	4
3000C	LAKE	MIRROR LAKE		21FLKWAT117MIRROR2		1994	1994	4
3000C	LAKE	MIRROR LAKE		21FLKWAT117MIRROR1		1994	1994	4
3002D	LAKE	STARKE LAKE	4	21FLKWATSTARKE1	LAKE STARKE1 IN ORANGE CO.	1992	2001	369
3002D	LAKE	STARKE LAKE		21FLKWATSTARKE2	LAKE STARKE2 IN ORANGE CO.	1992	2001	374
3002D	LAKE	STARKE LAKE		21FLKWATSTARKE3	LAKE STARKE3 IN ORANGE CO.	1992	2001	372
3002D	LAKE	STARKE LAKE		21FLORANBW60	LAKE STARKE	1992	1998	596
3002E	LAKE	LAKE PRIMAVISTA	4	21FLKWATPRIMAVISTA3	LAKE PRIMAVISTA3 IN ORANGE CO.	1992	2001	370
3002E	LAKE	LAKE PRIMAVISTA		21FLKWATPRIMAVISTA2	LAKE PRIMAVISTA2 IN ORANGE CO.	1992	2001	374
3002E	LAKE	LAKE PRIMAVISTA		21FLORANBW80	CENTER OF LAKE PRIMA VISTA	1992	1998	586
3002E	LAKE	LAKE PRIMAVISTA		21FLKWATPRIMAVISTA1	LAKE PRIMAVISTA1 IN ORANGE CO.	1992	2001	372
3002F	LAKE	LAKE BENNETT	3	21FLKWATBENNETT1	LAKE BENNETT1 IN ORANGE CO.	1992	2001	382
3002F	LAKE	LAKE BENNETT		21FLKWATBENNETT2	LAKE BENNETT2 IN ORANGE CO.	1992	2001	384
3002F	LAKE	LAKE BENNETT		21FLKWATBENNETT3	LAKE BENNETT3 IN ORANGE CO.	1992	2001	381
3002G	LAKE	LAKE LOTTA	6	21FLKWATSOUTH LOTTA3	LAKE SOUTH LOTTA3 IN ORANGE CO.	1992	2001	376
3002G	LAKE	LAKE LOTTA		21FLKWATSOUTH LOTTA2	LAKE SOUTH LOTTA2 IN ORANGE CO.	1992	2001	374
3002G	LAKE	LAKE LOTTA		21FLKWATSOUTH LOTTA1	LAKE SOUTH LOTTA1 IN ORANGE CO.	1992	2001	376
3002G	LAKE	LAKE LOTTA		21FLKWATNORTH LOTTA1	LAKE NORTH LOTTA1 IN ORANGE CO.	1992	2001	379
3002G	LAKE	LAKE LOTTA		21FLKWATNORTH LOTTA3	LAKE NORTH LOTTA3 IN ORANGE CO.	1992	2001	382
3002G	LAKE	LAKE LOTTA		21FLKWATNORTH LOTTA2	LAKE NORTH LOTTA2 IN ORANGE CO.	1992	2001	379
3002I	LAKE	LAKE ROSE	3	21FLKWATROSE3	LAKE ROSE3 IN ORANGE CO.	1993	1998	30
3002I	LAKE	LAKE ROSE		21FLKWATROSE2	LAKE ROSE2 IN ORANGE CO.	1993	1998	30
3002I	LAKE	LAKE ROSE		21FLKWATROSE1	LAKE ROSE1 IN ORANGE CO.	1993	1998	27
3002J	LAKE	LAKE HIAWASSEE	1	21FLORANBW26	LAKE HIAWASSEE CENTER	1994	1998	442
3002K	LAKE	LAKE OLIVIA	3	21FLKWATOLIVIA1	LAKE OLIVIA1 IN ORANGE CO.	1992	2001	99
3002K	LAKE	LAKE OLIVIA		21FLKWATOLIVIA2	LAKE OLIVIA2 IN ORANGE CO.	1992	2001	98
3002K	LAKE	LAKE OLIVIA		21FLKWATOLIVIA3	LAKE OLIVIA3 IN ORANGE CO.	1992	2001	99
3002L	LAKE	LAKE JOHIO	3	21FLKWAT095JOHIO2		2001	2001	20
3002L	LAKE	LAKE JOHIO		21FLKWAT095JOHIO3		2001	2001	20
3002L	LAKE	LAKE JOHIO		21FLKWAT095JOHIO1		2001	2001	20
3004	STREAM	LITTLE WEKIVA CANAL	3	21FLORANLWD	L. WEKIVA R. AT ORANOLE RD.	1992	1998	578
3004	STREAM	LITTLE WEKIVA CANAL		21FLA 20010133	LIT WEKIVA CANAL AT ORANOLE RD	1997	1997	19
3004	STREAM	LITTLE WEKIVA CANAL		21FLORANLWA	L. WEKIVA R. AT SILVER STAR RD.	1992	1998	581
3004A	LAKE	BEAR LAKE	9	21FLSEM BER	BEAR LAKE	1998	2001	79

Appendix G (continued)

WBID	Waterbody Type	Waterbody Segment	# of Stations	STORET Station ID	Station Description	Begin Date	End Date	# of Obs.
Wekiva River Planning Unit (continued)								
3004A	LAKE	BEAR LAKE		21FLSEM LBR	LITTLE BEAR LAKE	1999	2001	66
3004A	LAKE	BEAR LAKE		21FLKWATBEAR1	BEAR IN SEMINOLE CO.	1992	2001	477
3004A	LAKE	BEAR LAKE		21FLKWATBEAR2	BEAR IN SEMINOLE CO.	1992	2001	478
3004A	LAKE	BEAR LAKE		21FLKWATBEAR3	BEAR IN SEMINOLE CO.	1992	2001	478
3004A	LAKE	BEAR LAKE		21FLKWATBEAR4	BEAR IN SEMINOLE CO.	1992	2001	470
3004A	LAKE	BEAR LAKE		21FLKWATLITTLE BEAR3	LITTLE BEAR IN SEMINOLE CO.	1992	2001	335
3004A	LAKE	BEAR LAKE		21FLKWATLITTLE BEAR1	LITTLE BEAR IN SEMINOLE CO.	1992	2001	333
3004A	LAKE	BEAR LAKE		21FLKWATLITTLE BEAR2	LITTLE BEAR IN SEMINOLE CO.	1992	2001	333
3004C	LAKE	LAKE LAWNE	5	21FLORANLW10S	LAKE LAWNE - S. LOBE	1992	1998	1092
3004C	LAKE	LAKE LAWNE		21FLORL LAWNE S	LAKE LAWNE S	1993	1997	216
3004C	LAKE	LAKE LAWNE		21FLORANLW10N	LAKE LAWNE - N. LOBE	1992	1998	1084
3004C	LAKE	LAKE LAWNE		21FLORANLW10M	LAKELAWNE CENTER	1994	1998	425
3004C	LAKE	LAKE LAWNE		21FLORL LAWNE N	LAKE LAWNE N CENTER OF LK	1993	1997	233
3004D	LAKE	SILVER LAKE	5	21FLORANLW18	LAKE SILVER CENTER	1994	1998	406
3004D	LAKE	SILVER LAKE		21FLORL SILVER	LAKE SILVER	1993	1997	306
3004D	LAKE	SILVER LAKE		21FLKWATSILVER LAKE3	LAKE SILVER3 IN ORANGE CO.	1992	2001	167
3004D	LAKE	SILVER LAKE		21FLKWATSILVER LAKE2	LAKE SILVER2 IN ORANGE CO.	1992	2001	167
3004D	LAKE	SILVER LAKE		21FLKWATSILVER LAKE1	LAKE SILVER1 IN ORANGE CO.	1992	2001	169
3004E	LAKE	LAKE DANIEL	4	21FLKWATDANIEL1	LAKE DANIEL1 IN ORANGE CO.	1992	2001	60
3004E	LAKE	LAKE DANIEL		21FLORL DANIEL	LAKE DANIEL	1993	1997	297
3004E	LAKE	LAKE DANIEL		21FLKWATDANIEL3	LAKE DANIEL3 IN ORANGE CO.	1992	2001	60
3004E	LAKE	LAKE DANIEL		21FLKWATDANIEL2	LAKE DANIEL2 IN ORANGE CO.	1992	2001	60
3004F	LAKE	LAKE SARAH	4	21FLKWATSARAH1	LAKE SARAH1 IN ORANGE CO.	1992	2001	461
3004F	LAKE	LAKE SARAH		21FLORL SARAH	LAKE SARAH	1993	1997	300
3004F	LAKE	LAKE SARAH		21FLKWATSARAH2	LAKE SARAH2 IN ORANGE CO.	1992	2001	462
3004F	LAKE	LAKE SARAH		21FLKWATSARAH3	LAKE SARAH3 IN ORANGE CO.	1992	2001	460
3004H	LAKE	LITTLE LAKE FAIRVIEW	4	21FLORANLW11	LITTLE LAKE FAIRVIEW	1994	1998	390
3004H	LAKE	LITTLE LAKE FAIRVIEW		21FLKWATL TL FAIRVIEW3	LAKE LTL FAIRVIEW3 IN ORANGE CO.	1992	2001	391
3004H	LAKE	LITTLE LAKE FAIRVIEW		21FLKWATL TL FAIRVIEW2	LAKE LTL FAIRVIEW2 IN ORANGE CO.	1992	2001	391
3004H	LAKE	LITTLE LAKE FAIRVIEW		21FLKWATL TL FAIRVIEW1	LAKE LTL FAIRVIEW1 IN ORANGE CO.	1992	2001	390
3004K	LAKE	LAKE WEKIVA/ORLANDO	1	21FLORL ORLANDO EAST	LAKE ORLANDO EAST	1993	1995	165
3004N	LAKE	LAKE FAIRVIEW LAKE	5	21FLORANLW28	LAKE FAIRVIEW - N. LOBE	1992	1998	600
3004N	LAKE	LAKE FAIRVIEW LAKE		21FLORL FAIRVIEW	LAKE FAIRVIEW CENTER	1993	1997	249
3004N	LAKE	LAKE FAIRVIEW LAKE		21FLKWATFAIRVIEW3	LAKE FAIRVIEW3 IN ORANGE CO.	1998	2000	70
3004N	LAKE	LAKE FAIRVIEW LAKE		21FLKWATFAIRVIEW2	LAKE FAIRVIEW2 IN ORANGE CO.	1998	2000	70
3004N	LAKE	LAKE FAIRVIEW LAKE		21FLKWATFAIRVIEW1	LAKE FAIRVIEW1 IN ORANGE CO.	1997	2000	97

of obs (observations)—number of water quality data points

Appendix H: Summary of Water Quality Data for the Middle St. Johns Basin

Table H-1: Summary of Water Quality Data for LAKES in Alexander Springs Creek Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	91	1	1200	20	12	1.67	=800 MPN
	Total Coliform (/100ml)	2	10	50	30	56	0.54	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	26	4.8	9.4	7.4	7.63	0.97	=5 mg/l
Metal								
	Silver (ug/l)	1	3	3	3	0.08	37.50	=0.07 ug/l
	Arsenic (ug/l)	1	20	20	20	4.3	4.65	=50 ug/l
	Beryllium (ug/l)	1	0.5	0.5	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	1	3	3	3	0.2	15.00	=e (0.7852[LnH]-3.49) ug/l
	Copper (ug/l)	2	1	5	3	2	1.50	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	3	8	11	9	84	0.11	=1.0 mg/l
	Mercury (ug/l)	1	0.1	0.1	0.1	0.2	0.50	=0.012 ug/l
	Manganese (ug/l)	1	23	23	23	12.05	1.91	
	Nickel (ug/l)	1	5	5	5	2	2.50	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	3	0	1.6	1	1	1.00	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	1	30	30	30	5	6.00	=5.0 ug/l
	Thallium (ug/l)	1	50	50	50	5	10.00	=6.3 ug/l
	Zinc (ug/l)	3	7	17	12	10	1.20	=e(0.8473[LnH]+0.7614) ug/l

*Appendix H (continued)***H-1: Summary of Water Quality Data for LAKES in Alexander Springs Creek Planning Unit (continued)**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	17	1	2	1	58	0.02	>20mg/l as CaCO3
	Chloride (mg/l)	22	8.6	14.8	10.7	61	0.18	
	Conductance (uohm/cm)	26	63	110	76.5	475	0.16	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	2	40	43	41.5	258	0.16	
	pH (SU)	15	3.7	7	4.1	7.6	0.54	<6, >8.5
	Turbidity (NTU)	26	0.26	2.8	1.2	4.4	0.27	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	9	2.9E-11	0.378	1.49E-09	0.0003543	0.00	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	589	0.75	10.5	1	9.3135	0.11	
	Chlorophyll Corrected (ug/l)	10	1	6.5	1.6	16.8	0.10	

Appendix H (continued)

Table H-2: Summary of Water Quality Data for BLACKWATER in Deep Creek Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Colliform (/100ml)	14	2	15600	145	41	3.54	=800 MPN
DO								
	Dissolved Oxygen (mg/l)	42	3.73	9.6	6.395	6	1.07	=5 mg/l
Metal								
	Silver (ug/l)	11	-0.2	0.64	0.01	0.065	0.15	=0.07ug/l
	Aluminum (ug/l)	33	59.6	1620	587	435.5	1.35	
	Arsenic (ug/l)	44	0	2.93	0.9	1	0.90	=50 ug/l
	Barium (ug/l)	33	3	40	13.7	12	1.14	
	Cadmium (ug/l)	44	-0.1	1.13	0.1	0.385	0.26	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	44	0.001	4.09	1.19	1	1.19	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	44	0	6.22	1.085	1.66	0.65	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	44	430	1770	1031.5	819	1.26	=1.0 mg/l
	Manganese (ug/l)	33	0	50.2	14.1	11	1.28	
	Nickel (ug/l)	44	0	9.89	1.8	1	1.80	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	44	-1	3	0.805	1	0.81	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	33	0	12.4	0.33	1	0.33	=5.0 ug/l
	Zinc (ug/l)	44	3.393	36	11.5	9	1.28	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-2: Summary of Water Quality Data for BLACKWATER in Deep Creek Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Pesticide								
	Lindane (ug/l)	1	0.09	0.09	0.09	0.1	0.90	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	45	1	181.25	8	8	1.00	>20mg/l as CaCO3
	Chloride (mg/l)	45	9.49	53	17.576	9	1.95	
	Conductance (uohm/cm)	42	64	490	110	72	1.53	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	44	81	360	142.5	111	1.28	
	pH (SU)	42	3.8	7	5.495	4.68	1.17	<6, >8.5
	Turbidity (NTU)	49	1.1	10.1	2.8	1.4	2.00	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	29	2.5E-09	0.0004	2.96E-07	7.4E-09	40.03	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	319	0.237	12	3	1.43	2.10	

Appendix H (continued)

Table H-3: Summary of Water Quality Data for LAKES in Deep Creek Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	296	3	160	20	12	1.67	=800 MPN
	Total Coliform (/100ml)	257	5	665	75	56	1.34	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	614	2.44	9	6.63	7.63	0.87	=5 mg/l
Metal								
	Silver (ug/l)	20	0	3.5	0.01	0.08	0.13	=0.07ug/l
	Aluminum (ug/l)	50	38.4	489	101	100	1.01	
	Arsenic (ug/l)	53	-1	20	1.04	4.3	0.24	=50 ug/l
	Barium (ug/l)	36	14.583	45	18.35	15.7	1.17	
	Beryllium (ug/l)	1	0.5	0.5	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	74	-0.074	5.3	0.2	0.2	1.00	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	72	-0.3	5	0.42	1	0.42	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	103	0	13.8	1.64	2	0.82	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	133	0.743	1220	261	84	3.11	=1.0 mg/l
	Mercury (ug/l)	2	0.1	0.2	0.15	0.2	0.75	=0.012 ug/l
	Manganese (ug/l)	57	0	32	4.34	12.05	0.36	
	Nickel (ug/l)	72	-1	40	1.005	2	0.50	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	103	-0.16	7	0.87	1	0.87	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	2	13	36	24.5	13	1.88	=4,300 ug/l
	Selenium (ug/l)	40	0	25.45	0.37	5	0.07	=5.0 ug/l
	Thallium (ug/l)	3	5	50	5	5	1.00	=6.3 ug/l
	Zinc (ug/l)	103	0.01	36	9	10	0.90	=e(0.8473[LnH]+0.7614) ug/l

*Appendix H (continued)***Table H-3: Summary of Water Quality Data for LAKES in Deep Creek Planning Unit (continued)**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Pesticide								
	Lindane (ug/l)	2	0.09	0.09	0.09	0.49	0.18	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	218	3	76.3	31.5	58	0.54	>20mg/l as CaCO3
	Chloride (mg/l)	188	13	459	20.5	61	0.34	
	Conductance (uohm/cm)	616	108	1950	690	475	1.45	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	190	69	1020	121	258	0.47	
	Fluoride (mg/l)	31	0.1	0.12	0.1	0.2	0.50	=10.0 mg/l
	pH (SU)	592	6.06	7.96	7.1	7.6	0.93	<6, >8.5
	Turbidity (NTU)	429	0.5	6.6	2.1	4.4	0.48	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	176	9.8E-09	0.001	9.87E-05	0.0003543	0.28	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	914	0.7	28.3	2.005	9.3135	0.22	
	Chlorophyll Corrected (ug/l)	19	0.61	41.74	9.3	16.8	0.55	

Appendix H (continued)

Table H-4: Summary of Water Quality Data for STREAMS in Deep Creek Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	185	5	195	20	60	0.33	=800 MPN
	Total Coliform (/100ml)	196	20	660	122.5	470	0.26	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	420	3.15	9.135	6.67	5.5	1.21	=5 mg/l
Metal								
	Iron (ug/l)	83	98	682	250	207	1.21	=1.0 mg/l
Standard								
	Alkalinity (mg/l)	103	30	79.5	57.2	72	0.79	>20mg/l as CaCO3
	Chloride (mg/l)	102	97.1	646	266	27.9	9.53	
	Conductance (uohm/cm)	404	422	2104	853.5	446	1.91	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	82	243	1280	573.5	214	2.68	
	pH (SU)	419	6.74	8.41	7.39	7.2	1.03	<6, >8.5
	Turbidity (NTU)	309	0.75	8	1.6	2.4	0.67	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	40	0	0.0075	0.000647	0.000148	4.37	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	303	0.6	40.84	3.4	3.636	0.94	

*Appendix H (continued)***Table H-5: Summary of Water Quality Data for LAKES in Econlockhatchee River Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	283	2	270	10	12	0.83	=800 MPN
	Total Coliform (/100ml)	226	2	960	37	56	0.66	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	355	4.5	9.7	7.3	7.63	0.96	=5 mg/l
Metal								
	Silver (ug/l)	22	1	3	1	0.08	12.50	=0.07ug/l
	Aluminum (ug/l)	36	0.047	1000	119	100	1.19	
	Arsenic (ug/l)	37	5	25	25	4.3	5.81	=50 ug/l
	Cadmium (ug/l)	77	0.1	1	0.3	0.2	1.50	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	74	0.5	10	3	1	3.00	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	101	0.7	43	5	2	2.50	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	28	0.058	248	50	84	0.60	=1.0 mg/l
	Manganese (ug/l)	58	1	50	10	12.1	0.83	
	Nickel (ug/l)	84	3	50	40	2	20.00	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	101	0.5	7	5	1	5.00	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	22	13	13	13	13	1.00	=4,300 ug/l
	Selenium (ug/l)	51	5	5	5	5	1.00	=5.0 ug/l
	Thallium (ug/l)	22	5	5	5	5	1.00	=6.3 ug/l
	Zinc (ug/l)	101	3	30	10	10	1.00	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-5: Summary of Water Quality Data for LAKES in Econlockhatchee River Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	329	1	51	23	58	0.40	>20mg/l as CaCO3
	Chloride (mg/l)	169	8	32	16.9	61	0.28	
	Conductance (uohm/cm)	344	63	245	138	475	0.29	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	240	3	151	88	258	0.34	
	pH (SU)	342	5	8.38	6.75	7.6	0.89	<6, >8.5
	Turbidity (NTU)	287	0.7	7.8	1.7	4.4	0.39	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	312	1.5465E-07	0.0042869	0.00008466	0	0.24	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	856	1.9	33	8	9.31	0.86	

*Appendix H (continued)***Table H-6: Summary of Water Quality Data for STREAMS in Econlockhatchee River Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	637	10	680	86	60	1.43	=800 MPN
	Total Coliform (/100ml)	407	48	4400	430	470	0.91	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	1004	3.4	8.6	5.900000005	5.5	1.07	=5 mg/l
Metal								
	Silver (ug/l)	46	0	3	1	0.2	5.00	=0.07ug/l
	Aluminum (ug/l)	137	0.153	1000	182	52	3.50	
	Arsenic (ug/l)	84	0.01	25	5	2.57	1.95	=50 ug/l
	Boron (ug/l)	4	34	110	57.5	36	1.60	
	Barium (ug/l)	4	12	15	13	15	0.87	
	Beryllium (ug/l)	5	0.5	1	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	198	0	12	0.5	0.3	1.67	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	192	0.5	10	1.930000001	1.32	1.46	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	247	0.9	70	5	1.97	2.54	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	202	0.23	813	363	207	1.75	=1.0 mg/l
	Mercury (ug/l)	2	0.1	0.2	0.15	0.2	0.75	=0.012 ug/l
	Manganese (ug/l)	146	3	50	10	13	0.77	
	Nickel (ug/l)	200	0	500	40	1.59	25.24	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	247	0.150000001	6.8	2.8	1	2.80	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	31	13	13	13	2.2	5.91	=4,300 ug/l
	Selenium (ug/l)	101	0.2	5	5	1.2	4.17	=5.0 ug/l

Appendix H (continued)

Table H-6: Summary of Water Quality Data for STREAMS in Econlockhatchee River Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/Statewide Median	Criteria
Metal								
	Thallium (ug/l)	32	5	5	5	1.1	4.55	=6.3 ug/l
	Zinc (ug/l)	244	0.057	37	15	7	2.14	=e(0.8473[LnH]+0.7614) ug/l
Pesticide								
	Lindane (ug/l)	1	360	360	360	0.1	3600.00	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	788	8	73	36	72	0.50	>20mg/l as CaCO3
	Chloride (mg/l)	490	10.2	111.39	25	27.9	0.90	
	Conductance (uohm/cm)	994	81	559	194	446	0.43	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	542	89	350	142	214	0.66	
	Fluoride (mg/l)	3	0.11	0.2	0.14	0.15	0.93	=10.0 mg/l
	pH (SU)	993	5.7	7.57	6.78	7.2	0.94	<6, >8.5
	Turbidity (NTU)	816	0.9	12.4	3	2.4	1.25	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	793	5.929E-07	0.000968	0.00011425	0	0.77	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	677	0	13.2	1.3	3.64	0.36	

*Appendix H (continued)***Table H-7: Summary of Water Quality Data for LAKES in Lake George Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	199	5	105	10	12	0.83	=800 MPN
	Total Coliform (/100ml)	208	5	560	75	56	1.34	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	651	3.39	10.28	7.2	7.63	0.94	=5 mg/l
Metal								
	Silver (ug/l)	19	0	3	0.01	0.08	0.13	=0.07ug/l
	Aluminum (ug/l)	39	8.57	273	86.5	100	0.87	
	Arsenic (ug/l)	63	0	4.2	1.47	4.3	0.34	=50 ug/l
	Barium (ug/l)	42	3.46	23	16.6	15.7	1.06	
	Beryllium (ug/l)	1	0.5	0.5	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	72	0	3	0.14	0.2	0.70	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	71	0	2.79	1	1	1.00	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	97	0	9	1.34	2	0.67	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	108	21	455	190	84	2.26	=1.0 mg/l
	Mercury (ug/l)	2	0.1	0.2	0.15	0.2	0.75	=0.012 ug/l
	Manganese (ug/l)	59	1.64	18	9.22	12.1	0.77	
	Nickel (ug/l)	66	0	17.3	2	2	1.00	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	96	0	7	0.99	1	0.99	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	42	0	68.7	2.525	5	0.51	=5.0 ug/l
	Thallium (ug/l)	1	50	50	50	5	10.00	=6.3 ug/l
	Zinc (ug/l)	104	0.001	25	9	10	0.90	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-7: Summary of Water Quality Data for LAKES in Lake George Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Pesticide								
	Lindane (ug/l)	5	0.09	360	0.68	0.49	1.39	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	250	43.562	84.441	66.1935	58	1.14	>20mg/l as CaCO3
	Chloride (mg/l)	242	110	355.924	234.4395	61	3.84	
	Conductance (uohm/cm)	652	478	1478	951.5	475	2.00	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	216	336	836	621	258	2.41	
	Fluoride (mg/l)	3	0.11	0.21	0.15	0.2	0.75	=10.0 mg/l
	pH (SU)	634	6.65	9.05	7.6	7.6	1.00	<6, >8.5
	Turbidity (NTU)	454	1.3	11	4.1	4.4	0.93	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	142	0.00003721	0.0080456	0.00035666	0	1.01	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	1956	1	53	6	9.31	0.64	
	Chlorophyll Corrected (ug/l)	16	5.2	138.73	25.18	16.8	1.50	
TSICHLA								
	Chlorophyll (ug/l)	134	0	2	0.5	2	0.25	

*Appendix H (continued)***Table H-8: Summary of Water Quality Data for STREAMS in Lake George Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	179	2	86	10	60	0.17	=800 MPN
	Total Coliform (/100ml)	179	15	505	120	470	0.26	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	504	3.32	10	7.68	5.5	1.40	=5 mg/l
Metal								
	Aluminum (ug/l)	2	61.1	74.2	67.65	52	1.30	
	Arsenic (ug/l)	2	0.41	0.49	0.45	2.57	0.18	=50 ug/l
	Barium (ug/l)	2	21.2	24.2	22.7	15	1.51	
	Cadmium (ug/l)	4	0	0.1	0.0045	0.3	0.02	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	5	0.26	0.8	0.6	1.32	0.45	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	28	0	9.33	1.55	1.97	0.79	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	30	25	580	123.5	207	0.60	=1.0 mg/l
	Manganese (ug/l)	5	9.84	20.6	14.4	13	1.11	
	Nickel (ug/l)	5	0	1	0.21	1.59	0.13	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	26	0	3	0.695	1	0.70	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	2	0.001	0.001	0.001	1.2	0.00	=5.0 ug/l
	Zinc (ug/l)	29	0	20	4	7	0.57	=e(0.8473[LnH]+0.7614) ug/l
Pesticide								
	Lindane (ug/l)	1	0.09	0.09	0.09	0.1	0.90	=0.063 ug/l annual avg.; 0.08 ug/l max

Appendix H (continued)

Table H-8: Summary of Water Quality Data for Streams in Lake George Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	268	43	86	63	72	0.88	>20mg/l as CaCO ₃
	Chloride (mg/l)	316	128	370	253	27.9	9.07	
	Conductance (uohm/cm)	505	530	1530	1051	446	2.36	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	274	314	831	625	214	2.92	
	Fluoride (mg/l)	18	0.11	0.32	0.16	0.15	1.07	=10.0 mg/l
	pH (SU)	472	6.8	8.94	7.6	7.2	1.06	<6, >8.5
	Turbidity (NTU)	450	1.5	10.3	4.1	2.4	1.71	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	116	0.00004456	0.0088935	0.0003515	0	2.38	=0.02 mg/l as NH ₃
TSICHLA								
	Chlorophyll (ug/l)	371	3.6	72.248	23.211	3.64	6.38	
	Chlorophyll Corrected (ug/l)	36	1.15	74.97	9.025	3.8	2.38	

*Appendix H (continued)***Table H-9: Summary of Water Quality Data for LAKES in Lake Jesup Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	738	2	300	20	12	1.67	=800 MPN
	Total Coliform (/100ml)	469	4	520	45	56	0.80	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	1615	4.86	12.7	8.42	7.63	1.10	=5 mg/l
Metal								
	Silver (ug/l)	46	0.007	3	1	0.08	12.50	=0.07ug/l
	Aluminum (ug/l)	85	0.058	1000	500	100	5.00	
	Arsenic (ug/l)	93	1	25	5	4.3	1.16	=50 ug/l
	Beryllium (ug/l)	1	0.5	0.5	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	162	0.1	1.1	0.4	0.2	2.00	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	161	0.5	10	3	1	3.00	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	209	1	30	5	2	2.50	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	578	13	385	114	84	1.36	=1.0 mg/l
	Mercury (ug/l)	2	0.1	0.2	0.15	0.2	0.75	=0.012 ug/l
	Manganese (ug/l)	98	0.01	40	10	12.1	0.83	
	Nickel (ug/l)	155	2	50	40	2	20.00	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	206	0.7	11.3	5	1	5.00	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	38	13	13	13	13	1.00	=4,300 ug/l
	Selenium (ug/l)	83	0.2	6	5	5	1.00	=5.0 ug/l
	Thallium (ug/l)	39	5	5	5	5	1.00	=6.3 ug/l
	Zinc (ug/l)	206	3	39	10.5	10	1.05	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-9: Summary of Water Quality Data for LAKES in Lake Jesup Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Pesticide								
	Lindane (ug/l)	1	360	360	360	0.49	734.69	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	1416	15	84	55.6999996	58	0.96	>20mg/l as CaCO3
	Chloride (mg/l)	984	9.8	351	100	61	1.64	
	Conductance (uohm/cm)	1524	121	1333	251.5	475	0.53	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	1201	6	748	163	258	0.63	
	pH (SU)	1538	6.44	9.5200005	7.92	7.6	1.04	<6, >8.5
	Turbidity (NTU)	1349	1.3	26	6.4	4.4	1.45	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	782	0.00001444	0.0155924	0.00062429	0	1.76	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	8082	2	89	23	9.31	2.47	
	Chlorophyll Corrected (ug/l)	18	9.28	153.53	74.67	16.8	4.44	

*Appendix H (continued)***Table H-10: Summary of Water Quality Data for STREAMS in Lake Jesup Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	47	43	3430	300	60	5.00	=800 MPN
	Total Coliform (/100ml)	14	60	8900	635	470	1.35	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	758	1.03999996	9.10000004	6.350000014	5.5	1.15	=5 mg/l
Metal								
	Silver (ug/l)	25	-0.1	3	0.03	0.2	0.15	=0.07ug/l
	Aluminum (ug/l)	6	86	1000	1000	52	19.23	
	Arsenic (ug/l)	36	0.01	25	1.74000002	2.57	0.68	=50 ug/l
	Cadmium (ug/l)	38	-0.1	18	0.24	0.3	0.80	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	40	-0.7	15	1.15	1.32	0.87	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	53	1	20	2.1	1.97	1.07	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	545	121	1090	334	207	1.61	=1.0 mg/l
	Manganese (ug/l)	15	3	50	13.2	13	1.02	
	Nickel (ug/l)	39	0	500	2	1.59	1.26	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	46	0	13.8	2	1	2.00	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	2	13	13	13	2.2	5.91	=4,300 ug/l
	Selenium (ug/l)	6	0.2	5	5	1.2	4.17	=5.0 ug/l
	Thallium (ug/l)	2	5	5	5	1.1	4.55	=6.3 ug/l
	Zinc (ug/l)	43	2.5	61	28	7	4.00	=e(0.8473[LnH]+0.7614) ug/l
Pesticide								
	Lindane (ug/l)	1	0.68	0.68	0.68	0.1	6.80	=0.063 ug/l annual avg.; 0.08 ug/l max

Appendix H (continued)

Table H-10: Summary of Water Quality Data for STREAMS in Lake Jesup Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	716	43	125	76	72	1.06	>20mg/l as CaCO3
	Chloride (mg/l)	703	17	1188	40	27.9	1.43	
	Conductance (uohm/cm)	730	183	3900	313.5	446	0.70	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	709	112	2280	206	214	0.96	
	pH (SU)	739	6.3499999 1	7.8099999	7.13000011	7.2	0.99	<6, >8.5
	Turbidity (NTU)	759	1	13.6	2.59999991	2.4	1.08	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	60	1.5991E-07	0.0013605	0.00016329	0	1.10	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	718	0.01	36.099999	2.38649997	3.64	0.66	

*Appendix H (continued)***Table H-11: Summary of Water Quality Data for LAKES in Lake Kerr Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	5	2	20	2	12	0.17	=800 MPN
	Total Coliform (/100ml)	2	10	20	15	56	0.27	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	37	6.33	10.27	7.84	7.63	1.03	=5 mg/l
Metal								
	Silver (ug/l)	8	0	0.27	0.055	0.08	0.69	=0.07ug/l
	Aluminum (ug/l)	20	19	297.5	73.65	100	0.74	
	Arsenic (ug/l)	25	0	4.4	1.04	4.3	0.24	=50 ug/l
	Barium (ug/l)	20	9.55	13.2	11.55	15.7	0.74	
	Cadmium (ug/l)	29	0	2.6	0.13	0.2	0.65	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	31	0.001	8.3	0.6	1	0.60	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	31	0	32.1	1.74	2	0.87	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	33	0.01	348	50	84	0.60	=1.0 mg/l
	Manganese (ug/l)	21	12.7	24.9	17.1	12.1	1.42	
	Nickel (ug/l)	27	0	17	1.22	2	0.61	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	29	0	9	0.33	1	0.33	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	19	0	74.8	5	5	1.00	=5.0 ug/l
	Zinc (ug/l)	32	2	35	6.69	10	0.67	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-11: Summary of Water Quality Data for LAKES in Lake Kerr Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Pesticide								
	Lindane (ug/l)	1	1.49	1.49	1.49	0.49	3.04	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	38	1	12	2	58	0.03	>20mg/l as CaCO3
	Chloride (mg/l)	37	25	36	32	61	0.52	
	Conductance (uohm/cm)	38	37	224	202.5	475	0.43	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	37	53	148	109	258	0.42	
	pH (SU)	38	5.1	5.99	5.55	7.6	0.73	<6, >8.5
	Turbidity (NTU)	38	0.2	3.4	1.7	4.4	0.39	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	35	7.519E-11	2E-05	2.04397E-07	0	0.00	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	201	1	8	2	9.31	0.21	

*Appendix H (continued)***Table H-12: Summary of Water Quality Data for SPRINGS in Lake Kerr Planning Unit**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	93	1	600	10	10	1.00	=800 MPN
	Total Coliform (/100ml)	18	10	2600	250	100	2.50	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	1	6.05	6.05	6.05	2	3.03	=5 mg/l
Metal								
	Iron (ug/l)	13	6	680	34	34.5	0.99	=1.0 mg/l
Standard								
	Alkalinity (mg/l)	17	42	52	44	158	0.28	>20mg/l as CaCO ₃
	Chloride (mg/l)	17	0.4	13	4	6.7	0.60	
	Conductance (uohm/cm)	18	108	144	117	352	0.33	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	16	58	94	67	214	0.31	
	Fluoride (mg/l)	12	0.06	0.13	0.07	0.12	0.58	=10.0 mg/l
	pH (SU)	19	2.04	8.68	8.27	7.31	1.13	<6, >8.5

Appendix H (continued)

Table H-13: Summary of Water Quality Data for STREAMS in Lake Kerr Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	57	2	1100	30	60	0.50	=800 MPN
	Total Coliform (/100ml)	25	10	1100	130	470	0.28	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	103	3.43	8.87	7.08	5.5	1.29	=5 mg/l
Metal								
	Silver (ug/l)	7	0.2	3	0.2	0.2	1.00	=0.07ug/l
	Arsenic (ug/l)	54	0	3	2	2.57	0.78	=50 ug/l
	Barium (ug/l)	15	2	14	6	15	0.40	
	Beryllium (ug/l)	1	0.5	0.5	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	88	0	0.6	0.5	0.3	1.67	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	90	0.3	5	2	1.32	1.52	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	90	0	5	2	1.97	1.02	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	95	15	92	50	207	0.24	=1.0 mg/l
	Mercury (ug/l)	81	0.1	0.2	0.2	0.2	1.00	=0.012 ug/l
	Manganese (ug/l)	91	27	87.1	47	13	3.62	
	Nickel (ug/l)	85	0	20	2	1.59	1.26	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	94	0	5	2	1	2.00	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	86	1	2	2	1.2	1.67	=5.0 ug/l
	Thallium (ug/l)	1	50	50	50	1.1	45.45	=6.3 ug/l
	Zinc (ug/l)	96	7	58	25	7	3.57	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-13: Summary of Water Quality Data for STREAMS in Lake Kerr Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	99	1	61	3	72	0.04	>20mg/l as CaCO ₃
	Chloride (mg/l)	99	8	500	12	27.9	0.43	
	Conductance (uohm/cm)	103	54	1730	109	446	0.24	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	89	45	609	80	214	0.37	
	pH (SU)	104	3.8	7.1	4.59	7.2	0.64	<6, >8.5
	Turbidity (NTU)	99	0.4	5	1.5	2.4	0.63	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	100	5.715E-11	0.000104	1.05129E-07	0	0.00	=0.02 mg/l as NH ₃
TSICHLA								
	Chlorophyll (ug/l)	89	0.797	12.387	3.515	3.64	0.97	

Appendix H (continued)

Table H-14: Summary of Water Quality Data for LAKES in Lake Monroe Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	308	5	215	10	12	0.83	=800 MPN
	Total Coliform (/100ml)	325	5	495	45	56	0.80	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	1609	2.19	11.89	7.2	7.63	0.94	=5 mg/l
Metal								
	Silver (ug/l)	9	-0.1	1.3	0.09999999	0.08	1.25	=0.07ug/l
	Aluminum (ug/l)	36	18.7	216	99.85	100	1.00	
	Arsenic (ug/l)	50	-1	5.93	1.17	4.3	0.27	=50 ug/l
	Barium (ug/l)	37	15.9	44	25.1	15.7	1.60	
	Cadmium (ug/l)	52	-0.1	1.79	0.028	0.2	0.14	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	52	0	4.3	0.908	1	0.91	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	58	0	8.93	1.305	2	0.65	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	544	38	1720	242.25	84	2.88	=1.0 mg/l
	Manganese (ug/l)	43	5.5	38.6	17.77	12.1	1.47	
	Nickel (ug/l)	52	-1	12.6	2	2	1.00	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	58	-1	4.3	0.68999995	1	0.69	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	37	0	90.2	1	5	0.20	=5.0 ug/l
	Zinc (ug/l)	58	-2.364	42	9	10	0.90	=e(0.8473[LnH]+0.7614) ug/l
Pesticide								
	Lindane (ug/l)	2	1.75	360	180.875	0.49	369.13	=0.063 ug/l annual avg.; 0.08 ug/l max

Appendix H (continued)

Table H-14: Summary of Water Quality Data for LAKES in Lake Monroe Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	849	41	120	64	58	1.10	>20mg/l as CaCO ₃
	Chloride (mg/l)	826	19	889	116.5	61	1.91	
	Conductance (uohm/cm)	1540	209	1768	665	475	1.40	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	804	118	1890	322	258	1.25	
	pH (SU)	1523	6.46	9.34	7.49	7.6	0.99	<6, >8.5
	Turbidity (NTU)	1209	1	18	4.2	4.4	0.95	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	710	1.111E-05	0.019079	0.00050261	0	1.42	=0.02 mg/l as NH ₃
TSICHLA								
	Chlorophyll (ug/l)	2720	1	68.18	5.3	9.31	0.57	
	Chlorophyll Corrected (ug/l)	53	1.5	166.6	17.71	16.8	1.05	
TSICHLA								
	Chlorophyll (ug/l)	3	1	1	1	2	0.50	

Appendix H (continued)

Table H-15: Summary of Water Quality Data for STREAMS in Lake Monroe Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	320	5	305	25	60	0.42	=800 MPN
	Total Coliform (/100ml)	326	20	785	155	470	0.33	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	698	2.39	9.26	6.4	5.5	1.16	=5 mg/l
Metal								
	Silver (ug/l)	1	4	4	4	0.2	20.00	=0.07ug/l
	Aluminum (ug/l)	18	65.74	173.2	123.95	52	2.38	
	Arsenic (ug/l)	21	0.13	36	2.43	2.57	0.95	=50 ug/l
	Barium (ug/l)	40	17.75	43.5	28.05	15	1.87	
	Beryllium (ug/l)	1	0.5	0.5	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	22	-0.027	3	0.019	0.3	0.06	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	21	0.16	22.6	0.484	1.32	0.37	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	48	0	6.95	1.29	1.97	0.65	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	87	60	582	196.355	207	0.95	=1.0 mg/l
	Mercury (ug/l)	2	0.1	0.2	0.15	0.2	0.75	=0.012 ug/l
	Manganese (ug/l)	21	7.6	53.88	16.88	13	1.30	
	Nickel (ug/l)	21	0.27	17.3	2.337	1.59	1.47	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	47	-2	3	0.44	1	0.44	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	21	0.001	3.51	0.35	1.2	0.29	=5.0 ug/l
	Thallium (ug/l)	1	50	50	50	1.1	45.45	=6.3 ug/l
	Zinc (ug/l)	47	-0.596	11	4	7	0.57	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-15: Summary of Water Quality Data for STREAMS in Lake Monroe Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Pesticide								
	Lindane (ug/l)	1	0.09	0.09	0.09	0.1	0.90	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	99	32	95	52	72	0.72	>20mg/l as CaCO3
	Chloride (mg/l)	115	100	460	230	27.9	8.24	
	Conductance (uohm/cm)	680	441	1715	870	446	1.95	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	84	286	997	551.5	214	2.58	
	pH (SU)	664	6.62	8.5	7.315	7.2	1.02	<6, >8.5
	Turbidity (NTU)	445	1	10.4	3.1	2.4	1.29	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	71	0	0.008101	0.00052003	0	3.51	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	366	1.8	58.88	13.97	3.64	3.84	
	Chlorophyll Corrected (ug/l)	34	1.26	146.42	19.98	3.8	5.26	

Appendix H (continued)

Table H-16: Summary of Water Quality Data for LAKES in Lake Woodruff Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	421	5	145	5	12	0.42	=800 MPN
	Total Coliform (/100ml)	453	5	400	50	56	0.89	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	497	3.65	10.47	7.07	7.63	0.93	=5 mg/l
Metal								
	Aluminum (ug/l)	1	76.7	76.7	76.7	100	0.77	
	Arsenic (ug/l)	1	5.18	5.18	5.18	4.3	1.20	=50 ug/l
	Barium (ug/l)	1	25.7	25.7	25.7	15.7	1.64	
	Chromium III (ug/l)	1	0.51	0.51	0.51	1	0.51	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	25	0	9.27	1.37	2	0.69	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	25	72	688	200	84	2.38	=1.0 mg/l
	Manganese (ug/l)	1	17.57	17.57	17.57	12.1	1.46	
	Nickel (ug/l)	1	0.67	0.67	0.67	2	0.34	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	21	0	1.96	0.58	1	0.58	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	1	0.09	0.09	0.09	5	0.02	=5.0 ug/l
	Zinc (ug/l)	21	1	16	5	10	0.50	=e(0.8473[LnH]+0.7614) ug/l
Pesticide								
	Lindane (ug/l)	1	0.09	0.09	0.09	0.49	0.18	=0.063 ug/l annual avg.; 0.08 ug/l max

*Appendix H (continued)***Table H-16: Summary of Water Quality Data for LAKES in Lake Woodruff Planning Unit (continued)**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	25	37.8	84	57.7	58	0.99	>20mg/l as CaCO3
	Chloride (mg/l)	25	44	341	178	61	2.92	
	Conductance (uohm/cm)	516	469	1343	875	475	1.84	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	25	280	736	452	258	1.75	
	pH (SU)	486	6.68	9.01	7.665	7.6	1.01	<6, >8.5
	Turbidity (NTU)	470	0.75	6.9	2.2	4.4	0.50	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	21	1.006E-05	0.003103	0.00017966	0	0.51	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	1304	2	66.5	16	9.31	1.72	
	Chlorophyll Corrected (ug/l)	36	1.28	62.79	18.34	16.8	1.09	
DO								
	Dissolved Oxygen (mg/l)	11	0.7	3.3	0.8	2	0.40	=5 mg/l
Standard								
	Chloride (mg/l)	35	320	670	450	6.7	67.16	
	Conductance (uohm/cm)	37	1440	2610	1840	352	5.23	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	12	576	1060	867.5	214	4.05	
	pH (SU)	12	6.8	7.6	7.35	7.31	1.01	<6, >8.5

Appendix H (continued)

Table H-17: Summary of Water Quality Data for STREAMS in Lake Woodruff Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	879	5	280	25	60	0.42	=800 MPN
	Total Coliform (/100ml)	880	50	692.5	225	470	0.48	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	1686	2.53	8.29	5.37	5.5	0.98	=5 mg/l
Metal								
	Silver (ug/l)	29	0	1	1	0.2	5.00	=0.07ug/l
	Aluminum (ug/l)	21	2	251	25.3	52	0.49	
	Arsenic (ug/l)	26	0.3	3.54	1.87	2.57	0.73	=50 ug/l
	Barium (ug/l)	62	17	29	21.6	15	1.44	
	Beryllium (ug/l)	3	0.5	0.5	0.5	0.5	1.00	=0.13 ug/l annual avg.
	Cadmium (ug/l)	27	0	2.9	0.21	0.3	0.70	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	29	0	1.5	0.34	1.32	0.26	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	57	0	7	1	1.97	0.51	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	77	0.01	450	80	207	0.39	=1.0 mg/l
	Manganese (ug/l)	41	1	13.8	4.06	13	0.31	
	Nickel (ug/l)	46	0	16	1	1.59	0.63	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	56	0	7	0.62	1	0.62	=e(1.273[LnH]-4.7055) ug/l
	Selenium (ug/l)	39	0.001	155	1	1.2	0.83	=5.0 ug/l
	Zinc (ug/l)	53	0.55	71	7	7	1.00	=e(0.8473[LnH]+0.7614) ug/l

Appendix H (continued)

Table H-17: Summary of Water Quality Data for STREAMS in Lake Woodruff Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Pesticide								
	Lindane (ug/l)	2	0.09	0.09	0.09	0.1	0.90	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	94	39.6	140	74	72	1.03	>20mg/l as CaCO3
	Chloride (mg/l)	121	99	507	246	27.9	8.82	
	Conductance (uohm/cm)	1661	493	1475	904.9	446	2.03	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	103	293	1060	632	214	2.95	
	pH (SU)	1559	6.6	8.12	7.2	7.2	1.00	<6, >8.5
	Turbidity (NTU)	1005	0.8	6.2	2.5	2.4	1.04	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	66	0	0.00514	0.00021516	0	1.45	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	818	1.11	50.4	10.245	3.64	2.82	
	Chlorophyll Corrected (ug/l)	126	0.88	35	10.635	3.8	2.80	

Appendix H (continued)

Table H-18: Summary of Water Quality Data for LAKES in Wekiva River Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	454	2	540	22	12	1.83	=800 MPN
	Total Coliform (/100ml)	321	10	830	70	56	1.25	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	600	4.1	10.265	7.7	7.63	1.01	=5 mg/l
Metal								
	Silver (ug/l)	21	1	3	1	0.08	12.50	=0.07ug/l
	Aluminum (ug/l)	45	25	1000	500	100	5.00	
	Arsenic (ug/l)	43	5	25	5	4.3	1.16	=50 ug/l
	Cadmium (ug/l)	95	0.1	6	0.5	0.2	2.50	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	94	0.5	10	5	1	5.00	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	136	1.9	73	7	2	3.50	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	29	0.13	195	30	84	0.36	=1.0 mg/l
	Manganese (ug/l)	64	3	40	10	12.1	0.83	
	Nickel (ug/l)	102	3	500	40	2	20.00	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	130	0.6	7.4	5	1	5.00	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	21	13	13	13	13	1.00	=4,300 ug/l
	Selenium (ug/l)	51	0.2	5	5	5	1.00	=5.0 ug/l
	Thallium (ug/l)	21	5	5	5	5	1.00	=6.3 ug/l
	Zinc (ug/l)	130	1	31	9.5	10	0.95	=e(0.8473[LnH]+0.7614) ug/l

*Appendix H (continued)***Table H-18: Summary of Water Quality Data for LAKES in Wekiva River Planning Unit (continued)**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	530	13	69	46	58	0.79	>20mg/l as CaCO ₃
	Chloride (mg/l)	240	9.25	28.4	15	61	0.25	
	Conductance (uohm/cm)	529	113	291	195	475	0.41	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	398	4	180	104	258	0.40	
	pH (SU)	550	6.26	8.61	7.5	7.6	0.99	<6, >8.5
	Turbidity (NTU)	473	0.7	12.7	4	4.4	0.91	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	502	1.925E-05	0.00561	0.00043327	0	1.22	=0.02 mg/l as NH ₃
TSICHLA								
	Chlorophyll (ug/l)	5611	2	72	16	9.31	1.72	

Appendix H (continued)

Table H-19: Summary of Water Quality Data for SPRINGS in Wekiva River Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	38	2	1000	130	10	13.00	=800 MPN
	Total Coliform (/100ml)	35	10	9000	830	100	8.30	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	47	1.38	8	5.9	2	2.95	=5 mg/l
Metal								
	Silver (ug/l)	2	1	1	1	1	1.00	=0.07ug/l
	Aluminum (ug/l)	2	25	25	25	20	1.25	
	Arsenic (ug/l)	2	25	25	25	1	25.00	=50 ug/l
	Cadmium (ug/l)	7	0.1	7	0.3	1	0.30	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	6	0.5	10	2	2.5	0.80	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	9	3	30	20	2.5	8.00	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	2	13	13	13	34.5	0.38	=1.0 mg/l
	Manganese (ug/l)	6	3	40	10	2	5.00	
	Nickel (ug/l)	9	3	500	40	2	20.00	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	9	0.7	10.2	5	2	2.50	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	2	13	13	13	13	1.00	=4,300 ug/l
	Selenium (ug/l)	5	0.2	5	5	3.5	1.43	=5.0 ug/l
	Thallium (ug/l)	2	5	5	5	5	1.00	=6.3 ug/l
	Zinc (ug/l)	9	1.4	208	5	5.5	0.91	=e(0.8473[LnH]+0.7614) ug/l

*Appendix H (continued)***Table H-19: Summary of Water Quality Data for SPRINGS in Wekiva River Planning Unit (continued)**

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Standard								
	Alkalinity (mg/l)	43	29	122	85.5	158	0.54	>20mg/l as CaCO ₃
	Chloride (mg/l)	31	7	38.7	12.4	6.7	1.85	
	Conductance (uohm/cm)	47	167	355	254	352	0.72	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	32	10	178	130	214	0.61	
	pH (SU)	47	6.3	7.8	7.31	7.31	1.00	<6, >8.5
	Turbidity (NTU)	46	0.1	9.5	1.45	0.35	4.14	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	40	1.432E-05	0.001217	0.00019503	0	1.82	=0.02 mg/l as NH ₃
TSICHLA								
	Chlorophyll (ug/l)	40	0	4.75	1.1185	2	0.56	

Appendix H (continued)

Table H-20: Summary of Water Quality Data for STREAMS in Wekiva River Planning Unit

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Bacteria								
	Fecal Coliform (/100ml)	256	15	1300	100	60	1.67	=800 MPN
	Total Coliform (/100ml)	228	110	3600	600	470	1.28	=2,400 MPN
DO								
	Dissolved Oxygen (mg/l)	624	2.06	8.7	5.385	5.5	0.98	=5 mg/l
Metal								
	Silver (ug/l)	34	-0.4	3	0.01	0.2	0.05	=0.07ug/l
	Aluminum (ug/l)	92	0	382	154.508	52	2.97	
	Arsenic (ug/l)	129	0	5.165	1.01	2.57	0.39	=50 ug/l
	Boron (ug/l)	5	2	59	23	36	0.64	
	Barium (ug/l)	98	7	21.3	11.2	15	0.75	
	Beryllium (ug/l)	6	0.05	1	0.75	0.5	1.50	=0.13 ug/l annual avg.
	Cadmium (ug/l)	159	-0.1	9	0.14	0.3	0.47	=e (0.7852[LnH]-3.49) ug/l
	Chromium III (ug/l)	156	0.001	10	0.92	1.32	0.70	=e(0.819[LnH]+1.561) ug/l
	Copper (ug/l)	211	0	30	1.84	1.97	0.93	=e(0.8545[LnH]+1.465) ug/l
	Iron (ug/l)	191	5	1240	235	207	1.14	=1.0 mg/l
	Mercury (ug/l)	2	0.1	0.2	0.15	0.2	0.75	=0.012 ug/l
	Manganese (ug/l)	128	1	40	10	13	0.77	
	Nickel (ug/l)	164	0	40	2	1.59	1.26	=e(0.846[LnH]+1.1645) ug/l
	Lead (ug/l)	213	0	7.1	0.76	1	0.76	=e(1.273[LnH]-4.7055) ug/l
	Antimony (ug/l)	4	13	13	13	2.2	5.91	=4,300 ug/l
	Selenium (ug/l)	104	0.001	15.6	0.25	1.2	0.21	=5.0 ug/l

Appendix H (continued)

Table H-20: Summary of Water Quality Data for STREAMS in Wekiva River Planning Unit (continued)

Category	Parameter	Number of Observations	5 th %	95 th %	Median	State wide Median	Median/ Statewide Median	Criteria
Metal								
	Thallium (ug/l)	5	5	50	5	1.1	4.55	=6.3 ug/l
	Zinc (ug/l)	212	0.01	56	8	7	1.14	=e(0.8473[L.nH]+0.7614) ug/l
Pesticide								
	Lindane (ug/l)	6	0.09	360	0.09	0.1	0.90	=0.063 ug/l annual avg.; 0.08 ug/l max
Standard								
	Alkalinity (mg/l)	390	25	108	64	72	0.89	>20mg/l as CaCO3
	Chloride (mg/l)	355	6.6	166	19	27.9	0.68	
	Conductance (uohm/cm)	604	161	866	408	446	0.91	1275 or >50% Nat. Background
	Dissolved Solids (mg/l)	272	80	326	197	214	0.92	
	pH (SU)	603	6.1	7.8	7.06	7.2	0.98	<6, >8.5
	Turbidity (NTU)	511	0.6	12	2.1	2.4	0.88	=29 NTU above natural background conditions
	Unionized Ammonia (mg/l)	296	2.057E-07	0.002114	0.00017114	0	1.16	=0.02 mg/l as NH3
TSICHLA								
	Chlorophyll (ug/l)	389	0.01	17.5	1.634	3.64	0.45	
	Chlorophyll Corrected (ug/l)	12	1	3.3	1	3.8	0.26	

Appendix I: Potentially Impaired Waterbody Segments in the Middle St. Johns Basin, by Parameter (Based on the Impaired Surface Waters Rule)

Table I-1: Metals and Pesticides Parameters for Potentially Impaired Waterbody Segments

WBID	Basin Name	Waterbody Type	Water Use Classification	Arsenic	Silver	Beryllium	Chromium 3	Chromium 6	Cadmium	Copper	Fluoride	Iron	Mercury	Nickel	Lead	Antimony	Selenium	Thallium	Zinc	Lindane
Alexander Springs Planning Unit																				
2918B	BUCK LAKE	LAKE	3F											ID					ID	
2918C	SELLARS LAKE	LAKE	3F									ID								
2930A	AKRON LAKE	LAKE	3F																	
2930D	BLUE LAKE	LAKE	3F																	
2930E	SILVER PAISLEY LAKE	LAKE	3F																	
Deep Creek Planning Unit																				
2893F	STJ RIV AB LK JESSUP	STREAM	3F									NI								
2893H	MULLET LAKE	LAKE	3F								ID	ID								
2925	DEEP CR-LK ASHBY CA	BLACKWATER	3F	NI	ID	NI	NI	IM	NI	NI	IM	IM	NI	NI	IM	NI	NI	NI	NI	
2925A	LAKE ASHBY	LAKE	3F						IM	NI	NI	IM			IM				NI	
2931	LK WINNEMISSETT OUTLET	LAKE	3F	NI	ID	NI	NI	NI	NI	NI		NI		NI	IM		IM		NI	
2935	SAMSULA CANAL-SANDY DR	BLACKWATER	3F																	
2964	UNDERHILL SLOUGH	STREAM	3F									ID								
2964A	LAKE HARNEY	LAKE	3F	ID	ID	NI	NI	IM	NI	NI		NI		NI	IM	ID	ID		NI	

Table I-1: (continued)

[illegible]

Table I-1: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Arsenic	Silver	Beryllium	Chromium 3	Chromium 6	Cadmium	Copper	Fluoride	Iron	Mercury	Nickel	Lead	Antimony	Selenium	Thallium	Zinc	Lindane
Lake George Planning Unit																				
22130	STJ RIV AB OKLAWAHA R	STREAM	3F								NI									
2892	LAKE MARGARET	LAKE	3F																	
2892A	LAKE COMO	LAKE	3F																	
2892B	BANANA LAKE	LAKE	3F																	
2892C	LAKE ESTELLA	LAKE	3F																	
28934	SILVER GLEN SPRING	SPRING	3F																	
2893A	LAKE GEORGE	LAKE	3F	NI	ID	NI	NI	IM	NI	NI	ID	NI		NI	NI	IM			NI	ID
2893A1	STJ RIV BL LK GEORGE	STREAM	3F						NI	NI	ID	NI			ID				ID	
2893A2	STJ RIV AB LK GEORGE	STREAM	3F																	
2896	CLEAR LAKE	LAKE	3F																	
2902	LOWER LOUISE LAKE	LAKE	3F																	
2916A	CROOKED LAKE	LAKE	3F																	
Lake Jesup Planning Unit																				
2981	LAKE JESSUP	LAKE	3F	ID	ID	ID	ID	ID	ID	NI		NI		ID	IM				NI	
2982	PHELPS CREEK	STREAM	3F									NI								
2982A	SILVER LAKE	LAKE	3F																	
2982B	GOLDEN LAKE	LAKE	3F									ID								
2984	LAKE NAN	LAKE	3F			ID	ID	ID	ID	ID				ID	ID				ID	
2985	CHUB CREEK	STREAM	3F									IM								
2986	SOLDIER CREEK REACH	STREAM	3F	ID	IM	ID	ID	ID	ID	ID		NI		ID	IM				ID	
2986A	LAKE BINGHAM	LAKE	3F																	
2986B	LAKE MYRTLE	LAKE	3F									NI								
2990	SALT CREEK	STREAM	3F									IM								
2992	SWEETWATER CREEK	STREAM	3F									NI								
2994A	GEE CREEK	STREAM	3F	NI	IM	NI	NI	NI	NI	NI		NI		NI	IM				NI	

Table I-1: (continued)

[illegible]

Table I-1: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Arsenic	Silver	Beryllium	Chromium 3	Chromium 6	Cadmium	Copper	Fluoride	Iron	Mercury	Nickel	Lead	Antimony	Selenium	Thallium	Zinc	Lindane
Lake Jesup Planning Unit (continued)																				
2997L	LAKE WINYAH	LAKE	3F																	
2997M	LAKE FORMOSA	LAKE	3F				ID		ID	ID	ID	ID	ID	ID	ID				ID	
2997N	LAKE HIGHLAND	LAKE	3F																	
2997O	PARK LAKE	LAKE	3F																	
2997P	LAKE CONCORD	LAKE	3F				ID		ID	ID	ID	ID	ID	ID	ID				ID	
2997Q	LAKE DOT	LAKE	3F																	
2997R	LAKE ADAIR	LAKE	3F																	
2997S	LAKE SPRING	LAKE	3F																	
2997U	LAKE PARK	LAKE	3F	ID			ID		ID	ID				ID	ID				ID	
2997W	LAKE BELL	LAKE	3F																	
2997X	LAKE KILLARNEY	LAKE	3F				NI		NI	IM				NI	ID				NI	
2997Y	LAKE MIZELL	LAKE	3F	ID			ID		ID	ID				ID	ID	ID	ID		NI	
2999A	LAKE HAYES	LAKE	3F							ID										
2999B	NONAME LAKE	LAKE	3F																	
3009	BEAR GUILLEY LAKE	LAKE	3F									ID								
3009A	WAUNATTA LAKE	LAKE	3F				ID		ID	ID	ID	ID	ID	ID	ID				ID	
3009C	LAKE BURKETT	LAKE	3F				ID		ID	ID	ID	ID	ID	ID	ID				ID	
3009D	DEEP LAKE	LAKE	3F	ID			NI		ID	IM		ID		NI	IM		ID		NI	
3009E	LAKE GEORGIA	LAKE	3F				ID		ID	ID		ID		ID	ID				ID	

Table I-1: (continued)

[illegible]

Table I-1: (continued)

[illegible]

Table I-1: (continued)

[illegible]

Table I-1: (continued)

[illegible]

Table I-1: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Arsenic	Silver	Beryllium	Chromium 3	Chromium 6	Cadmium	Copper	Fluoride	Iron	Mercury	Nickel	Lead	Antimony	Selenium	Thallium	Zinc	Lindane
Wekiva River Planning Unit (continued)																				
3004H	LITTLE LAKE FAIRVIEW	LAKE	3F				ID		ID	ID				ID	ID				ID	
3004I	LAKE ROSE	LAKE	3F				ID		ID	IM				ID	ID				ID	
3004J	LAKE GANDY	LAKE	3F				ID		ID	ID				ID	ID				ID	
3004K	LAKE WEKIVA/ORLANDO	LAKE	3F																	
3004N	LAKE FAIRVIEW LAKE	LAKE	3F				ID		ID	IM				ID	IM				ID	
3011A	LAKE WESTON	LAKE	3F				ID		ID	ID				ID	ID				ID	

PI = Potentially Impaired

NI = Not Impaired

ID = Insufficient Data

Blank = No Data

NA = Not Applicable, no numeric criteria established for designated use

Table I-2: Conventional and Nutrients Parameters, Fish Advisories, and Biology for Potentially Impaired Waterbody Segments

WBID	Basin Name	Waterbody Type	Water Use Classification	Dissolved OxygenO	Fecal Coliforms	Total Coliforms	Turbidity	Unionized Ammonia Nitrate	Chlorophyll a	TSI	Historic Chlorophyll	Fish Advisory	Biology
Alexander Springs Creek Planning Unit													
2918B	BUCK LAKE	LAKE	3F	ID	ID	ID	ID						
2918C	SELLARS LAKE	LAKE	3F	NI	ID		NI	ID		NI		NI	NI
2930A	AKRON LAKE	LAKE	3F	NI			NI			NI			
2930D	BLUE LAKE	LAKE	3F							NI			
2930E	SILVER PAISLEY LAKE	LAKE	3F							NI			
Deep Creek Planning Unit													
2893F	STJ RIV AB LK JESSUP	STREAM	3F	IM	NI	NI	NI	NI	IM		IM	NI	
2893H	MULLET LAKE	LAKE	3F	ID			ID	NA				NI	
2925	DEEP CR-LK ASHBY CA	BLACKWATER	3F	IM	ID		NI	NI	NI				NI
2925A	LAKE ASHBY	LAKE	3F	NI	NI	NI	NI	NI		NI			
2931	LK WINNEMISSETT OUTLET	LAKE	3F	NI	ID		NI	NI		NI			
2935	SAMSULA CANAL-SANDY DR	BLACKWATER	3F	ID	ID		ID		ID				
2936	LAKE ASHBY CREEK	STREAM											NI
2964	UNDERHILL SLOUGH	STREAM	3F	IM	NI	NI	NI	NA	NI				
2964A	LAKE HARNEY	LAKE	3F	IM	NI	NI	NI	NA	NI	IM		IM	

Table I-2: (continued)

[illegible]

Table I-2: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Dissolved OxygenO	Fecal Coliforms	Total Coliforms	Turbidity	Nitrate	Unionized Ammonia	Chlorophyll a	TSI	Historic Chlorophyll	Fish Advisory	Biology
Econlockhatchee River Planning Unit (continued)														
3045	DITCHES	Stream	3F											NI
3050	Ditches	Stream	3F											NI
3053	TURKEY CREEK	STREAM	3F	ID	ID		ID			ID				
Lake George Planning Unit														
22130	STJ RIV AB OKLAWAHA R	STREAM	3F	NI	NI	NI	NI			IM			NI	
2892	LAKE MARGARET	LAKE	3F	ID			ID							
2892A	LAKE COMO	LAKE	3F								NI			
2892B	BANANA LAKE	LAKE	3F								NI			
2892C	LAKE ESTELLA	LAKE	3F								NI			
28934	SILVER GLEN SPRING	SPRING	3F							NI				
2893A	LAKE GEORGE	LAKE	3F	IM	NI	NI	NI		NI		IM		NI	IM
2893A1	STJ RIV BL LK GEORGE	STREAM	3F	NI	NI	NI	NI		NI	IM				
2893A2	STJ RIV AB LK GEORGE	STREAM	3F	IM	NI	NI	NI			IM				
2896	CLEAR LAKE	LAKE	3F								NI			
2902	LOWER LOUISE LAKE	LAKE	3F								NI			
2916A	CROOKED LAKE	LAKE	3F								NI			
Lake Jesup Planning Unit														
2981	LAKE JESSUP	LAKE	3F	NI	NI	NI	NI	NA	IM		IM		NI	
2982	PHELPS CREEK	STREAM	3F	NI			NI			NI				NI
2982A	SILVER LAKE	LAKE	3F								NI			
2982B	GOLDEN LAKE	LAKE	3F	ID			ID	NA						
2984	LAKE NAN	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			NI
2985	CHUB CREEK	STREAM	3F	IM			NI			IM				
2986	SOLDIER CREEK REACH	STREAM	3F	IM	IM		NI	NA	NI	NI		IM		NI
2986A	LAKE BINGHAM	LAKE	3F								NI			

Table I-2 (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Dissolved OxygenO	Fecal Coliforms	Total Coliforms	Turbidity	Nitrate	Unionized Ammonia	Chlorophyll a	TSI	Historic Chlorophyll	Fish Advisory	Biology
Lake Jesup Planning Unit (continued)														
2986B	LAKE MYRTLE	LAKE	3F	NI			NI	NA			NI			
2990	SALT CREEK	STREAM	3F	IM			NI			IM				IM
2992	SWEETWATER CREEK	STREAM	3F	IM			NI			NI				IM
2994A	GEE CREEK	STREAM	3F	NI	IM	ID	NI	NA	NI	IM				NI
2994B	LAKE KATHRYN	LAKE	3F	ID			ID		ID					
2994B1	TRIPLET LAKE	LAKE	3F								NI			
2994C	FAIRY LAKE	LAKE	3F	ID			ID							
2994E	RED BUG LAKE	LAKE	3F	ID			ID	NA						
2994F	ROCK LAKE	LAKE	3F								NI			
2994H	LAKE GRIFFIN	LAKE	3F								IM			
2994X	LITTLE LAKE HOWELL	LAKE	3F								NI			
2994Y	FRUITWOOD LAKE	LAKE	3F								IM			
2994Z	PRAIRIE LAKE	LAKE	3F	ID			ID				NI			
2995	Lake Charm Short Cut Canal	Lake	3F											NI
2996	SWEETWATER CREEK	STREAM	3F	NI			NI			NI				IM
2997	HOWELL CK BL LK HOWELL	STREAM	3F	NI	ID		NI	NA	ID	NI		IM		NI
29975	lake Sybella	LAKE	3F								NI			
29976	Lake Seminary	LAKE	3F	ID			ID	NA			NI			
29977	Lake in the Woods	LAKE	3F	ID			ID				IM			
2997A	HOWELL CREEK	STREAM	3F	IM	NI	NI	NI	NA	NI	NI				
2997B	HOWELL LAKE	LAKE	3F	NI	ID	ID	NI		ID		IM			
2997C	LAKE MAITLAND	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997D	LAKE MINNEHAHA	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997E	LAKE OSCEOLA NORTH	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997E1	LAKE OSCEOLA SOUTH	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			

Table I-2: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Dissolved OxygenO	Fecal Coliforms	Total Coliforms	Turbidity	Nitrate	Unionized Ammonia	Chlorophyll a	TSI	Historic Chlorophyll	Fish Advisory	Biology
Lake Jesup Planning Unit (continued)														
2997F	LAKE IVANHOE	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997G	LAKE VIRGINIA	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997I	LAKE SUE	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997J	LAKE ROWENA	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997K	LAKE ESTELLE	LAKE	3F	NI	NI			NA	NI		IM			
2997L	LAKE WINYAH	LAKE	3F	NI	NI			NA	NI		IM			
2997M	LAKE FORMOSA	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997N	LAKE HIGHLAND	LAKE	3F	NI	NI			NA	NI		NI			
2997O	PARK LAKE	LAKE	3F	NI	NI			NA	NI		NI			
2997P	LAKE CONCORD	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997Q	LAKE DOT	LAKE	3F	NI	NI			NA	NI		IM			
2997R	LAKE ADAIR	LAKE	3F	NI	NI			NA	NI		IM			
2997S	LAKE SPRING	LAKE	3F	NI	NI			NA	NI		IM			
2997U	LAKE PARK	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997W	LAKE BELL	LAKE	3F								NI			
2997X	LAKE KILLARNEY	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2997Y	LAKE MIZELL	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
2999A	LAKE HAYES	LAKE	3F	ID			ID	NA			NI			
2999B	NONAME LAKE	LAKE	3F								NI			
2999	Bear Creek	Stream	3F											NI
3009	BEAR GULLEY LAKE	LAKE	3F	ID			ID	NA			IM			
3009A	WAUNATTA LAKE	LAKE	3F	IM	NI	NI	NI	NA	NI		IM			
3009C	LAKE BURKETT	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3009D	DEEP LAKE	LAKE	3F	IM	ID	ID	NI	NA	NI		IM			
3009E	LAKE GEORGIA	LAKE	3F	IM	NI	NI	IM	NA	NI		NI			

Table I-2: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Dissolved OxygenO	Fecal Coliforms	Total Coliforms	Turbidity	Nitrate	Unionized Ammonia	Chlorophyll a	TSI	Historic Chlorophyll	Fish Advisory	Biology
Lake Kerr Planning Unit														
2894	LAKE DELANCEY	LAKE	3F	ID	ID	ID	ID							
2899	LITTLE LAKE KERR OUTLE	LAKE	3F										IM	
2899A	HOPKINS PRAIRIE	STREAM	3F	IM			NI		NI	NI				
2899B	LAKE KERR	LAKE	3F	NI	ID	ID	NI		NI		NI			
2900A	SALT SPRINGS	SPRING	3F		ID	ID								
2905	JUNIPER CREEK	STREAM	3F	NI	ID	ID	NI		NI	ID				NI
2905A	JUNIPER SPRING	SPRING	3F	ID										
2905C	WILDCAT LAKE	LAKE	3F								NI			NI
Lake Monroe Planning Unit														
2893	GEMINI SPRINGS NR DEBA	SPRING	3F							ID				
2893C	STJ RIV AB WEKIVA R.	STREAM	3F	IM	NI	NI	NI	NA	NI	IM			NI	IM
2893D	LAKE MONROE	LAKE	3F	IM	NI	NI	NI	NA	NI		IM		NI	
2893E	STJ RIV AB LK MONROE	STREAM	3F	IM	NI	NI	NI		NI	NI			NI	
2893M	THORNHILL LAKE	LAKE	3F										NI	
2938A	LAKE HELEN	LAKE	3F								NI			
2938B	DUPONT LAKE	LAKE	3F	ID	ID		ID		ID		NI			
2951	LAKE MARIE	LAKE	3F							IM				
2953	BETHEL LAKE	LAKE	3F								NI			
2953A	BROKEN ARROW LAKE	LAKE	3F								NI			
2953B	BIG LAKE	LAKE	3F	ID	ID		ID		ID		NI			
2959	LITTLE LAKE OUTLET	LAKE	3F										NI	
2962	SMITH CANAL	STREAM	3F	ID	ID		ID	NA		ID				IM
2962B	ADA LAKE	LAKE	3F								NI			
2962D	LAKE MARY	LAKE	3F								NI			
2962E	LITTLE LAKE MARY	LAKE	3F								NI			

Table I-2: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Dissolved OxygenO	Fecal Coliforms	Total Coliforms	Turbidity	Nitrate	Unionized Ammonia	Chlorophyll a	TSI	Historic Chlorophyll	Fish Advisory	Biology
Wekiva River Planning Unit (continued)														
2961	LAKE SYLVAN	LAKE	3F	ID			ID	NA			NI			NI
2967	ROCK SPRINGS RUN	SPRING	3F	IM	NI	IM	NI	NA	NI	NI				NI
2970	LAKE MARKHAM	LAKE	3F	ID			ID	NA						
2987	LITTLE WEKIVA RIVER	STREAM	3F	NI	IM	IM	NI	NA	NI	NI		IM		NI
2987A	SPRING LAKE	LAKE	3F	ID			ID				IM			
2897B	Little Wekiva River NW Ave T	Stream	3F											IM
2993	LAKE PREVATT	LAKE	3F	IM	NI	NI	NI	NA	NI		IM			
2998	CRANES ROOST OUTLET	LAKE	3F								NI			
2998A	LAKE FLORIDA	LAKE	3F								NI			
2998B	LAKE MOBILE	LAKE	3F								IM			
2998C	LAKE ORIENTA	LAKE	3F								IM			
3000	LAKE PEARL	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3000A	LAKE HARRIET	LAKE	3F	ID			ID	NA						
3000C	MIRROR LAKE	LAKE	3F	ID			ID							
3002	LUCY LAKE	LAKE	3F								NI			
3002B	SPRING LAKE	LAKE	3F								NI			
3002C	LAKE OLYMPIA	LAKE	3F								NI			
3002D	STARKE LAKE	LAKE	3F	NI	NI	NI	NI	NA	NI	IM				
3002E	LAKE PRIMAVISTA	LAKE	3F	NI	NI	NI	NI	NA	NI	IM				
3002F	LAKE BENNETT	LAKE	3F								NI			
3002G	LAKE LOTTA	LAKE	3F								IM			
3002H	LAKE SHERWOOD	LAKE	3F	IM			NI	NA	NI	IM				
3002I	LAKE ROSE	LAKE	3F								IM			
3002J	LAKE HIAWASSEE	LAKE	3F	NI	NI	NI	NI	NA	NI	IM				
3002K	LAKE OLIVIA	LAKE	3F								IM			

Table I-2: (continued)

WBID	Basin Name	Waterbody Type	Water Use Classification	Dissolved OxygenO	Fecal Coliforms	Total Coliforms	Turbidity	Nitrate	Unionized Ammonia	Chlorophyll a	TSI	Historic Chlorophyll	Fish Advisory	Biology
Wekiva River Planning Unit (continued)														
3004	LITTLE WEKIVA CANAL	STREAM	3F	IM	NI	IM	NI	NA	NI	IM				NI
3004A	BEAR LAKE	LAKE	3F	NI			NI	NA			NI			
3004B	LAKE FAIRVIEW	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3004C	LAKE LAWNE	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3004D	SILVER LAKE	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3004E	LAKE DANIEL	LAKE	3F	NI	NI			NA	NI		NI			
3004F	LAKE SARAH	LAKE	3F	NI	NI			NA	NI		NI			
3004G	BAY LAKE	LAKE	3F	NI	NI			NA	NI		IM			
3004H	LITTLE LAKE FAIRVIEW	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3004I	LAKE ROSE	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3004J	LAKE GANDY	LAKE	3F	IM	NI	NI	NI	NA	NI		NI			
3004K	LAKE WEKIVA/ORLANDO	LAKE	3F	ID	NI			NA	ID		IM			
3004N	LAKE FAIRVIEW LAKE	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			
3011A	LAKE WESTON	LAKE	3F	NI	NI	NI	NI	NA	NI		IM			

PI = Potentially Impaired

NI = Not Impaired

ID = Insufficient Data

NA = Not Applicable, no numeric criteria established for designated use

Blank = No Data

Appendix J: Integrated Report Categories for WBIDs by Planning Unit

(TSI and chlorophyll *a* are used as indicators of nutrient impairment.)

Table J-1: Alexander Springs Creek Planning Unit

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2918B	BUCK LAKE	LAKE	3F	COLI	N/A		3c planning list
2918C	SELLARS LAKE	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fish, TSI, Turbidity, Biology	2 meets some uses
2918Z	ALEXANDER SPRINGS	SPRING	3F	N/A	N/A		3a not enough data
2930A	AKRON LAKE	LAKE	3F	N/A	NA	Dissolved Oxygen, TSI, Turbidity	2 meets some uses
2930D	BLUE LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2930E	SILVER PAISLEY LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses

Appendix J (continued)

Table J-2: Deep Creek Unit Planning Unit

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2893F	STJ RIV AB LK JESSUP	STREAM	3F	N/A	Chlorophyll, Dissolved Oxygen, Historic Chlorophyll	Fecal Coliforms, Fish, Iron, Total Coliforms, Turbidity Unionized Ammonia	3d verified list
2893H	MULLET LAKE	LAKE	3F	N/A	N/A	Fish	2 meets some uses
2925	DEEP CR-LK ASHBY CA	BLACKWATER	3F	COLI, IRON, AG, PB, CD	Cadmium, Dissolved Oxygen, Iron, Lead	Arsenic, Chlorophyll a, Chromium 3, Copper, Selenium, Turbidity, Zinc, Nickel, Unionized Ammonia, Biology	3d verified list
2925A	LAKE ASHBY	LAKE	3F	N/A	Copper, Iron, Lead	Dissolved Oxygen, Fecal Coliforms, Fluoride, Total Coliforms, TSI, Turbidity, Zinc, Unionized Ammonia	3d verified list
2931	LK WINNEMISSETT OUTLET	LAKE	3F	N/A	Lead, Selenium	Arsenic, Cadmium, Chromium 3, Copper, dissolved Oxygen, Iron, Nickel, Zinc, TSI, Turbidity, Unionized Ammonia	3d verified list
2936	LAKE ASHBY CREEK	STREAM				Biology	2 meets some uses
2964	UNDERHILL SLOUGH	STREAM	3F	N/A	Dissolved Oxygen	Chlorophyll, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3c planning list
2935	SAMSULA CANAL-SANDY DRIVE	BLACKWATER	3F	N/A	N/A		3b not enough data
2964A	LAKE HARNEY	LAKE	3F	NUTR, DO, AG, CD	Dissolved Oxygen, Fish, Lead, TSI, Cadmium	Chromium 3, Copper, Fecal Coliforms, Iron, Nickel, Total Coliforms, Turbidity, Zinc, Unionized Ammonia	3d verified list

Appendix J (continued)

Table J-3: Econlockhatchee River Planning Unit

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2991	ECONLOCKHATCHEE RIVER	STREAM	3F	N/A	Cadmium, Copper, Dissolved Oxygen, Fish, Lead	Chlorophyll a, Chromium 3, Fecal Coliforms, Iron, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc, Biology	3d verified list
2991A	ECONLOCKHATCHEE RIVER	STREAM	3F	COLI, NUTR, BOD, FISH, DO, PB	Cadmium, Copper, Dissolved Oxygen, Fish, Lead, Silver	Arsenic, Chlorophyll a, Chromium 3, Fecal Coliforms, Iron, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc, Biology	3d verified list
3001	LITTLE ECONLOCKHATCHEE	STREAM	3F	COLI, NUTR, BOD, DO	Copper, Dissolved Oxygen, Lead, Total Coliforms, Biology	Cadmium, Chromium 3, Fecal Coliforms, Chlorophyll a, Iron, Nickel, Turbidity, Unionized Ammonia, Zinc	3d verified list
3001A	LONG LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
3003	LAKE PICKETT	LAKE	3F	N/A	Copper, Historic Chlorophyll, Lead, TSI	Cadmium, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc, Biology	3d verified list
3003A	LAKE MILLS	LAKE	3F	N/A	Biology		3c planning list
3012	LAKE PRICE OUTLET	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, TSI, Turbidity, Unionized Ammonia	2 meets some uses
014	CRANE STRAND DRAIN	STREAM	3F	NUTR, BOD, DO	Biology		3c planning list

Appendix J (continued)

Table J-3: Econlockhatchee River Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
3017	LAKE IRMA OUTLET	LAKE	3F	N/A	N/A		3b not enough data
3018	LAKE LOUISE OUTLET	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, TSI, Turbidity, Unionized Ammonia	2 meets some uses
3019	LAKE TANNER OUTLET	LAKE	3F	N/A	Copper, Dissolved Oxygen, TSI	Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3022	BITHLO BRANCH	STREAM	3F	N/A	Biology		3c planning list
3023	CRANE STRAND	STREAM	3F	N/A	Dissolved Oxygen, Fecal Coliform, Lead, Total Coliform	Cadmium, Chlorophyll a, Chromium 3, Copper, Nickel, Turbidity, Unionized Ammonia, Zinc	3d verified list
3023A	LAKE BALDWIN	LAKE	3F	N/A	Copper, Lead, Total Coliform, TSI	Dissolved Oxygen, Fecal Coliforms, Chromium 3, Cadmium, Nickel, Turbidity, Unionized Ammonia, Zinc	3d verified list
3023B	LAKE BARTON	LAKE	3F	N/A	Lead, TSI	Copper, Dissolved Oxygen, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
3023C	LAKE SUSANNAH	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fecal Coliforms, TSI, Unionized Ammonia	2 meets some uses
3024	LAKE DOWNEY	LAKE	3F	N/A	Lead, TSI, Copper	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list

*Appendix J (continued)***Table J-3: Econlockhatchee River Planning Unit (continued)**

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
3024A	TRIB TO LTL ECON RIV	STREAM	3F	N/A	Dissolved Oxygen, Lead, Total Coliforms	Chlorophyll a, Fecal Coliforms, Turbidity, Unionized Ammonia, Biology	3c planning list
3030	LONG BRANCH	STREAM	3F	COLI, NUTR, BOD, Turb, DO, Iron	Dissolved Oxygen	Biology	3c planning list
3033	UNAMED DRAIN	STREAM	3F	N/A	Biology		3c planning list
3033C	LAKE CORNER	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3033D	LAKE DRAWDY	LAKE	3F	N/A	Dissolved Oxygen, TSI	Fecal Coliforms, Turbidity, Unionized Ammonia	3d verified list
3036	LAKE FREDERICA	LAKE	3F	N/A	TSI	Cadmium, Chromium 3, Copper, Dissolved Oxygen, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3c planning list
3037	UNNAMED DRAIN	STREAM	3F	N/A	Dissolved Oxygen, Biology	Turbidity, Unionized Ammonia	3c planning list
3041	UNNAMED DITCHES	STREAM	3F	N/A	N/A	Biology	2 meets some uses
3045	DITCHES	STREAM	3F	N/A	N/A	Biology	2 meets some uses
3050	DITCHES	STREAM	3F	N/A	N/A	Biology	2 meets some uses
3053	TURKEY CREEK	STREAM	3F	N/A	N/A		3b not enough data

Appendix J (continued)

Table J-4: Lake George Planning Unit

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
22130	STJ RIV AB OKLAWAHA R	STREAM	3F	N/A	Chlorophyll a	Dissolved Oxygen, Fecal Coliforms, Fish, Fluoride, Total Coliforms, Turbidity	3d verified list
2892	LAKE MARGARET	LAKE	3F	N/A	N/A		3b not enough data
2892A	LAKE COMO	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2892B	BANANA LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2892C	LAKE ESTELLA	LAKE	3F	N/A	N/A	TSI	2 meets some uses
28934	SILVER GLEN SPRING	SPRING	3F	N/A	N/A	Chlorophyll a	2 meets some uses
2893A	LAKE GEORGE	LAKE	3F	N/A	Cadmium, Dissolved Oxygen, Selenium, TSI, Biology	Arsenic, Chromium 3, Copper, Fecal Coliforms, Fish, Iron, Lead, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
2893A1	STJ RIV BL LK GEORGE	STREAM	3F	N/A	Chlorophyll	Copper, Dissolved Oxygen, Fecal Coliforms, Iron, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2893A2	STJ RIV AB LK GEORGE	STREAM	3F	N/A	Chlorophyll, Dissolved Oxygen	Fecal Coliforms, Total Coliforms, Turbidity	3d verified list
2893A3	LAKE GEORGE LEFTOVER	LAKE	3F	N/A	N/A		3a no data
2902	LOWER LOUISE LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2916A	CROOKED LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2896	Clear Lake	Lake	3F			TSI	2 meets some uses
2916B	Grasshopper Lake	Lake	3F			TSI	2 meets some uses

*Appendix J (continued)***Table J-5: Lake Jesup Planning Unit**

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2981	LAKE JESSUP	LAKE	3F	NUTR, NH3	TSI, Unionized Ammonia, Lead	Copper, Dissolved Oxygen, Fecal Coliforms, Fish, Iron, Total Coliforms, Turbidity, Zinc	3d verified list
2982	PHELPS CREEK	STREAM	3F	N/A	N/A	Dissolved Oxygen, Iron, Chlorophyll a, Turbidity, Biology	2 meets some uses
2982A	SILVER LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2982B	GOLDEN LAKE	LAKE	3F	N/A	N/A		3b not enough data
2984	LAKE NAN	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Biology	3d verified list
2985	CHUB CREEK	STREAM	3F	N/A	Chlorophyll, Dissolved Oxygen, Iron	Turbidity	3d verified list
2986	SOLDIER CREEK REACH	STREAM	3F	COLI, NUTR, DO, PB	Dissolved Oxygen, Fecal Coliforms, Historic Chlorophyll a, Lead, Silver	Iron, Turbidity, Unionized Ammonia, Biology	3d verified list
2986B	LAKE MYRTLE	LAKE	3F	N/A	N/A	Dissolved Oxygen, Iron, TSI, Turbidity	2 meets some uses
2986A	LAKE BINGHAM	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2990	SALT CREEK	STREAM	3F	N/A	Chlorophyll, Dissolved Oxygen, Iron, Biology	Turbidity	3d verified list
2992	SWEETWATER CREEK	STREAM	3F	N/A	Dissolved Oxygen, Biology	Iron, Chlorophyll a, Turbidity	3d verified list

Appendix J (continued)

Table J-5: Lake Jesup Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2994A	GEE CREEK	STREAM	3F	COLI, NUTR, PB	Chlorophyll, Fecal Coliforms, Lead, Silver	Arsenic, Cadmium, Chromium 3, Copper, Dissolved Oxygen, Iron, Nickel, Turbidity, Unionized Ammonia, Zinc, Biology	3c planning list
2994B	LAKE KATHRYN	LAKE	3F	N/A	N/A		3b not enough data
2994B1	TRIPLET LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2994C	FAIRY LAKE	LAKE	3F	N/A	N/A		3b not enough data
2994E	RED BUG LAKE	LAKE	3F	N/A	N/A		3b insufficient data
2994F	ROCK LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2994X	LITTLE LAKE HOWELL	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2994Y	FRUITWOOD LAKE	LAKE	3F	N/A	TSI		3d verified list
2994Z	PRAIRIE LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2996	SWEETWATER CREEK	STREAM	3F	N/A	Biology	Chlorophyll a, Dissolved Oxygen, Iron, Turbidity	3c planning list
2994H	LAKE GRIFFIN	LAKE	3F	N/A	TSI		3c planning list
2995	LAKE CHARM SHORTCUT CANAL	STREAM	3F	N/A	N/A	Biology	2 meets some uses
2997	HOWELL CK BL LK HOWELL	STREAM	3F	N/A	Historic Chlorophyll	Dissolved Oxygen, Iron, Turbidity	3d verified list
29975	LAKE SYBELLA	LAKE	3F	N/A	N/A	TSI	2 meets some uses
29976	LAKE SEMINARY	LAKE	3F	N/A	N/A	TSI	2 meets some uses
29977	LAKE IN THE WOODS	LAKE	3F	N/A	TSI		3d verified list
2997A	HOWELL CREEK	STREAM	3F	N/A	Copper, Dissolved Oxygen, Lead	Cadmium, Chromium 3, Chlorophyll a, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3c planning list
2997B	HOWELL LAKE	LAKE	3F	N/A	TSI	Dissolved Oxygen, Turbidity	3d verified list

*Appendix J (continued)***Table J-5: Lake Jesup Planning Unit (continued)**

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2997C	LAKE MAITLAND	LAKE	3F	N/A	Lead, TSI	Copper, Chromium 3, Cadmium, Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3c planning list
2997D	LAKE MINNEHAHA	LAKE	3F	N/A	TSI	Cadmium, Copper, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
2997E	LAKE OSCEOLA NORTH	LAKE	3F	N/A	Copper, Lead, TSI	Cadmium, Chromium 3, Dissolved Oxygen, Nickel, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
2997E1	LAKE OSCEOLA SOUTH	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2997F	LAKE IVANHOE	LAKE	3F	N/A	TSI, Lead	Copper, Dissolved Oxygen, Chromium 3, Cadmium, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3c planning list

Appendix J (continued)

Table J-5: Lake Jesup Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2997G	LAKE VIRGINIA	LAKE	3F	N/A	Copper, Lead, TSI	Cadmium, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
2999	BEAR CREEK	STREAM	3F	N/A	N/A	Biology	2 meets some uses
2997I	LAKE SUE	LAKE	3F	N/A	Lead, TSI	Chromium 3, Cadmium, Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
2997J	LAKE ROWENA	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2997K	LAKE ESTELLE	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Unionized Ammonia	3c verified list
2997L	LAKE WINYAH	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Unionized Ammonia	3d verified list
2997M	LAKE FORMOSA	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2997N	LAKE HIGHLAND	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fecal Coliforms, TSI, Unionized Ammonia	2 meets some uses

*Appendix J (continued)***Table J-5: Lake Jesup Planning Unit (continued)**

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2997O	PARK LAKE	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fecal Coliforms, TSI, Unionized Ammonia	2 meets some uses
2997P	LAKE CONCORD	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2997Q	LAKE DOT	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Unionized Ammonia	3d verified list
2997R	LAKE ADAIR	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Unionized Ammonia	3d verified list
2997S	LAKE SPRING	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Unionized Ammonia	3d verified list
2997U	LAKE PARK	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2997W	LAKE BELL	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2997X	LAKE KILLARNEY	LAKE	3F	N/A	Copper, TSI	Cadmium, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Nickel, Turbidity, Unionized Ammonia, Zinc	3d verified list

Appendix J (continued)

Table J-5: Lake Jesup Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2997Y	LAKE MIZELL	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3c planning list
2999A	LAKE HAYES	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2999B	NONAME LAKE	LAKE	3F			TSI	2 meets some uses
3009	BEAR GULLEY LAKE	LAKE	3F	N/A	TSI		3d verified list
3009A	WAUNATTA LAKE	LAKE	3F	N/A	Dissolved Oxygen, TSI	Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3009C	LAKE BURKETT	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3009D	DEEP LAKE	LAKE	3F	N/A	Copper, Dissolved Oxygen, Lead, TSI	Chromium 3, Nickel, Turbidity, Unionized Ammonia, Zinc	3d verified list
3009E	LAKE GEORGIA	LAKE	3F	N/A	Dissolved Oxygen, Turbidity	Fecal Coliforms, Total Coliforms, TSI, Unionized Ammonia	3c planning list

*Appendix J (continued)***Table J-6: Lake Kerr Planning Unit**

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2894	LAKE DELANCEY	LAKE	3F	N/A	N/A		3b not enough data
2899	LITTLE LAKE KERR OUTLE	LAKE	3F	N/A	Fish		3d verified list
2899A	HOPKINS PRAIRIE	STREAM	3F	N/A	Dissolved Oxygen, Lead, Zinc	Chlorophyll a, Chromium 3, Copper, Iron, Nickel, Turbidity, Unionized Ammonia	3c planning list
2899B	LAKE KERR	LAKE	3F	N/A	Cadmium, Copper, Lead, Selenium, Silver	Dissolved Oxygen, Iron, TSI, Turbidity, Unionized Ammonia, Zinc	3d verified list
2900A	SALT SPRINGS	SPRING	3F	N/A	N/A		3b not enough data
2905	JUNIPER CREEK	STREAM	3F	N/A	N/A	Dissolved Oxygen, Turbidity, Unionized Ammonia, Biology	2 meets some uses
2905A	JUNIPER SPRING	SPRING	3F	N/A	N/A	Fluoride	2 meets some uses
2905C	WILDCAT LAKE	LAKE	3F	N/A	N/A	TSI, Biology	2 meets some uses

Appendix J (continued)

Table J-7: Lake Monroe Planning Unit

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2893C	STJ RIV AB WEKIVA R.	STREAM	3F	NUTR, BOD, TSS, DO, PB	Chlorophyll, Dissolved Oxygen, Biology	Arsenic, Cadmium, Chromium 3, Copper, Fish, Fecal Coliforms, Iron, Lead, Nickel, Total Coliforms, Selenium, Unionized Ammonia, Zinc	3d verified list
2893D	LAKE MONROE	LAKE	3F	NUTR, DO, NH3, PB, SE	Dissolved Oxygen, Selenium, Silver, TSI	Arsenic, Cadmium, Chromium 3, Copper, fecal Coliforms, Fish, Iron, Lead, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
2893E	STJ RIV AB LK MONROE	STREAM	3F	N/A	Dissolved Oxygen	Chlorophyll a, Fecal Coliforms, Fish, Iron, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2893M	THORNHILL LAKE	LAKE	3F	N/A	N/A	Fish	2 meets some uses
2938A	LAKE HELEN	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2893	GEMINI SPRINGS NR DEBARY SPRINGS	SPRING	3F	N/A	N/A		3b not enough data
2938B	DUPONT LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2951	LAKE MARIE	LAKE	3F	N/A	TSI		3d verified list
2953	BETHEL LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2953A	BROKEN ARROW LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2953B	BIG LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2959	LITTLE LAKE OUTLET	LAKE	3F	N/A	N/A	Fish	2 meets some uses

Appendix J (continued)

Table J-7: Lake Monroe Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2962	SMITH CANAL	STREAM	3F	COLI, NUTR, TURB, DO, IRON	Biology		3c planning list
2962B	ADA LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2962D	LAKE MARY	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2962E	LITTLE LAKE MARY	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2973	DEFOREST LAKE OUTLET	LAKE	3F	N/A	N/A	Dissolved Oxygen, Iron, Turbidity	2 meets some uses
2973C	EAST CRYSTAL LAKE	LAKE	3F	N/A	N/A	Dissolved Oxygen, TSI, Turbidity	2 meets some uses
2981A	LAKE JESUP NR St. JOHNS RIVER	LAKE	3F	NUTR, DO	Dissolved Oxygen, TSI	Iron, Turbidity, Unionized Ammonia	3d verified list
2973B	WEST CRYSTAL LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses

Appendix J (continued)

Table J-8: Lake Woodruff Planning Unit

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
28933	BLUE SPRING (Volusia)	SPRING	3F	NUTR	Dissolved Oxygen		3c planning list
2893B	STJ RIV AB LK WOODRUFF	STREAM	3F	N/A	Chlorophyll, Dissolved Oxygen, Selenium, Biology	Arsenic, Cadmium, Copper, Fecal Coliforms, Fish, Iron, Lead, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
2893U	LAKE BERESFORD	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Fish, Total Coliforms, Turbidity	3d verified list
2893Z	STJ RIV AB LAKE GEORGE	STREAM	3F	NUTR, TSS, DO	Chlorophyll, Dissolved Oxygen, Biology	Fecal Coliforms, Fish, Total Coliforms, Turbidity	3d verified list
2908	DEEP CREEK	STREAM	3F			Biology	2 meets some uses
2912A	LAKE EMPORIA	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2921	LAKE WOODRUFF	LAKE	3F	N/A	Dissolved Oxygen, TSI	Copper, Fecal Coliforms, Fish, Iron, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list

*Appendix J (continued)***Table J-9: Wekiva River Planning Unit**

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2929A	BLACK WATER CREEK	STREAM	3F	NUTR, DO, IRON, PB, CD, SE, ZINC	Dissolved Oxygen, Historic Chlorophyll, Iron, Selenium	Arsenic, Cadmium, Chromium 3, Copper, Fecal Coliforms, Lead, Nickel, silver, Turbidity, Unionized Ammonia, Zinc, Biology	3d verified list
2929B	LAKE NORRIS	LAKE	3F	N/A	N/A		3b not enough data
2929C	LAKE DORR	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2929D	LITTLE LAKE MARY	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2949	LAKE DALHOUSE OUTLET	LAKE	3F	N/A	N/A		3b not enough data
2956	WEKIVA RIVER	STREAM	3F	N/A	Copper, Dissolved Oxygen, Lead	Chlorophyll a, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Biology	3c planning list
2956A	WEKIVA RIVER	STREAM	3F	N/A	Copper, Dissolved Oxygen, Historic Chlorophyll a, Lead,	Cadmium, Chromium 3, Fecal Coliforms, Iron, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc, Biology	3d verified list
2956A1	LINDEN LAKE	LAKE	3F	N/A			3b insufficient data
2956B	WEKIVA RIVER LOWER	STREAM	3F	N/A	Dissolved Oxygen	Chlorophyll a, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia, Biology	3d verified list
2956C	WEKIVA SPRING (Orange)	SPRING	3F	COLI, NUTR	Dissolved Oxygen	Chlorophyll a, Total Coliforms, Turbidity, Unionized Ammonia	3c planning list
2956F	LAKE BRANTLEY	LAKE	3F	N/A	N/A	TSI, Biology	2 meets some uses

Appendix J (continued)

Table J-9: Wekiva River Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
2956X	SWEETWATER CREEK	STREAM	3F			Biology	2 meets some uses
2961	LAKE SYLVAN	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2967	ROCK SPRINGS RUN	SPRING	3F	COLI, NUTR, BOD, DO	Copper, Dissolved Oxygen, Lead, Total Coliforms	Chlorophyll a, Fecal Coliforms, Turbidity, Unionized Ammonia, Biology	3c planning list
2970	LAKE MARKHAM	LAKE	3F	N/A	N/A		3b insufficient data
2987	LITTLE WEKIVA RIVER	STREAM	3F	COLI, NUTR	Fecal Coliforms, Historic Chlorophyll a, Lead, Total Coliforms	Arsenic, Cadmium, Chromium 3, Copper, Dissolved Oxygen, Iron, Nickel, Selenium, Turbidity, Unionized Ammonia, Zinc, Biology	3d verified list
2987A	SPRING LAKE	LAKE	3F	N/A	TSI		3d verified list
2987B	LITTLE WEKIVA RIVER above Avenue T	STREAM	3F		Biology		3c planning list
2993	LAKE PREVATT	LAKE	3F	COLI, NUTR, DO	Copper, Dissolved Oxygen, Lead, TSI	Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
2998	CRANES ROOST OUTLET	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2998A	LAKE FLORIDA	LAKE	3F	N/A	N/A	TSI	2 meets some uses
2998B	LAKE MOBILE	LAKE	3F	N/A	TSI		3d verified list
2998C	LAKE ORIENTA	LAKE	3F	N/A	TSI		3d verified list
3000	LAKE PEARL	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3000A	LAKE HARRIET	LAKE	3F	N/A	N/A		3b not enough data
3000C	MIRROR LAKE	LAKE	3F	N/A	N/A		3b insufficient data

*Appendix J (continued)***Table J-9: Wekiva River Planning Unit (continued)**

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
3002	LUCY LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
3002K	LAKE OLIVIA	LAKE	3F	N/A	TSI		3c planning list
3002B	SPRING LAKE	LAKE	3F	N/A	N/A	TSI	2 meets some uses
3002C	LAKE OLYMPIA	LAKE	3F	N/A	N/A	TSI	2 meets some uses
3002D	STARKE LAKE	LAKE	3F	N/A	Copper, Lead, TSI	Chromium 3, Dissolved Oxygen, Fecal Coli-forms, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
3002E	LAKE PRIMAVISTA	LAKE	3F	N/A	Lead, TSI	Cadmium, Copper, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
3002F	LAKE BENNETT	LAKE	3F	N/A	N/A	TSI	2 meets some uses
3002G	LAKE LOTTA	LAKE	3F	N/A	TSI		3d verified list
3002H	LAKE SHERWOOD	LAKE	3F	N/A	Dissolved Oxygen, TSI	Turbidity, Unionized Ammonia	3d verified list
3002I	LAKE ROSE	LAKE	3F	N/A	TSI		3c planning list
3002J	LAKE HIAWASSEE	LAKE	3F	N/A	Copper, Lead, TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3004	LITTLE WEKIVA CANAL	STREAM	3F	COLI, NUTR, BOD, DO	Cadmium, Copper, Dissolved Oxygen, Total coliforms, Chlorophyll a	Chromium 3, Fecal Coliforms, Nickel, Turbidity, Unionized Ammonia, Zinc, Biology	3d verified list
3004A	BEAR LAKE	LAKE	3F	N/A	N/A	Dissolved Oxygen, TSI, Turbidity	2 meets some uses
3004B	LAKE FAIRVIEW	LAKE	3F	N/A	Copper, Lead, TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list

Appendix J (continued)

Table J-9: Wekiva River Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
3004C	LAKE LAWNE	LAKE	3F	N/A	Copper, Lead, TSI	Cadmium, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
3004C	LAKE LAWNE	LAKE	3F	N/A	Copper, Lead, TSI	Cadmium, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
3004C	LAKE LAWNE	LAKE	3F	N/A	Copper, Lead, TSI	Cadmium, Chromium 3, Dissolved Oxygen, Fecal Coliforms, Nickel, Total Coliforms, Turbidity, Unionized Ammonia, Zinc	3d verified list
3004D	SILVER LAKE	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3004E	LAKE DANIEL	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fecal Coliforms, TSI, Unionized Ammonia	2 meets some uses
3004F	LAKE SARAH	LAKE	3F	N/A	N/A	Dissolved Oxygen, Fecal Coliforms, TSI, Unionized Ammonia	2 meets some uses
3004G	BAY LAKE	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Unionized Ammonia	3d verified list

Appendix J (continued)

Table J-9: Wekiva River Planning Unit (continued)

WBID	Waterbody Segment	Waterbody Type	Class	1998 303(d) List Parameters of Concern	Parameters Potentially Impaired Under the Impaired Waters Rule	Parameters Not Impaired Under the Impaired Waters Rule	Integrated Assessment Category
3004H	LITTLE LAKE FAIRVIEW	LAKE	3F	N/A	TSI	Fecal Coliforms, Unionized Ammonia	3d verified list
3004I	LAKE ROSE	LAKE	3F	N/A	Copper, TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Unionized Ammonia, Turbidity	3d verified list
3004J	LAKE GANDY	LAKE	3F	N/A	Dissolved Oxygen	Fecal Coliforms, Total Coliforms, TSI, Turbidity, Unionized Ammonia	3c planning list
3004K	LAKE WEKIVA/ORLANDO	LAKE	3F	N/A	TSI	Fecal Coliforms	3c planning list
3004N	LAKE FAIRVIEW LAKE	LAKE	3F	N/A	Lead, TSI, Copper	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list
3011A	LAKE WESTON	LAKE	3F	N/A	TSI	Dissolved Oxygen, Fecal Coliforms, Total Coliforms, Turbidity, Unionized Ammonia	3d verified list



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