St. Johns River Water Management District

UPPER OCKLAWAHA RIVER BASIN

SWIM PLAN

March 1995

SWIM PLAN

FOR THE

UPPER OCKLAWAHA RIVER BASIN

Issued in Compliance with the
Surface Water Improvement and Management Act
Chapter 373.451 - 373.4596, F.S.
and
Rule 17-43.035, F.A.C.

Prepared by

Rolland S. Fulton III

With contributions from:
Gary Bethune
Gene Caputo
Michael Coveney
Carol Fall
Betsy Gisondi
Walter Godwin
Greeneville Hall
John Richmond
David Walker
Christopher Ware

St. Johns River Water Management District
Palatka, Florida

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EXECUTIVE SUMMARY

The Surface Water Improvement and Management Act (SWIM legislation - Chapter 87-97, Laws of Florida) was enacted in July, 1987, in response to growing concerns over environmental degradation of Florida's surface waters. The legislature recognized the state's responsibility to protect and enhance environmental and scenic characteristics of surface waters. Passage of the SWIM Act provided the direction and funding necessary to implement a statewide surface water management program. The water management districts were mandated to: (1) identify and prioritize significant water bodies in need of restoration or conservation and (2) to plan, implement and coordinate restoration and conservation strategies.

The St. Johns River Water Management District (SJRWMD) has identified the upper Ocklawaha River basin (UORB) as having a high priority for restoration. Surface waters within the UORB in the past were naturally productive. However, nutrient runoff from rapid urbanization and intensive agricultural practices has dramatically increased productivity of surface water bodies in the basin. In addition, stabilization of water levels by the operation of water control structures may have augmented accumulations of nutrients and sediments. Consequently, water quality has been degraded to levels severely impacting the ecological, aesthetic, recreational, and commercial benefits of these aquatic resources.

Agricultural and urban development, stabilization of water levels, and stream channelization have also resulted in substantial losses in wetland and other natural habitats in the UORB. The destruction or degradation of these natural systems hampers utilization of excess nutrients and reduces habitat for native plants and animals, including endangered and threatened species.

A review of available information on the UORB has identified five priority issues to be addressed by the SWIM program:

1) Excessive levels of nutrients.
2) Potentially hazardous levels of metals and organic pollutants.
3) Loss of wetland, shoreline, and other fish and wildlife habitats.
4) Interagency coordination in management.
5) Public awareness and education.

These issues are being addressed through an integrated set of diagnostic, restoration, and management activities designed to attain the quality of water and habitat necessary to restore and maintain healthy and productive natural systems, and to meet or exceed Florida Department of Environmental Protection (FDEP) Class III water quality standards.

Lake Apopka, a headwater lake in the Ocklawaha chain, is the subject of a separate SWIM plan. Improvements in discharge water quality from Lake Apopka will benefit the UORB system directly. Indirectly, diagnostic and feasibility studies and computer simulation modeling conducted for the Lake Apopka SWIM program will provide an important experience and data-base for the UORB SWIM efforts.

Diagnostic projects are being conducted to evaluate the present status of water bodies and to reach a clear understanding of the causes of existing problems. Feasibility studies will be necessary to determine the best techniques or combination of techniques for restoration. The results of restoration studies conducted in the Lake Apopka SWIM Program will be carefully considered for application to UORB water bodies. In addition, the UORB Technical Advisory Group will examine further restoration and management alternatives.

Diagnostic studies that have been completed for the UORB include land use mapping, mapping of existing wetlands, bathymetric and sediment depth mapping of major lakes, and an environmental assessment of Lake Weir. Major diagnostic projects still in progress include development of external and internal nutrient budgets and trophic state models for the lakes in the basin, and investigation of metals and organic pollutants in bottom sediments and fish tissues. The major feasibility projects in progess include development of a hydrologic and hydraulic model of the basin and development of methods to evaluate socioeconomic impacts of alternative water management strategies. Results of both of these projects are currently being used in development of new regulation schedules for the Ocklawaha Chain-of-Lakes. Additionally, extensive hydrological modeling is being conducted to evaluate feasibility and develop plans for wetland restoration projects in the basin.

Management and regulatory activities are being pursued concurrently with research. Acquisition of agricultural lands and existing habitats for restoration or preservation is in progress. Restoration of the historic Ocklawaha River channel and floodplain wetlands at Sunnyhill Farm, Emeralda Marsh, and Ocklawaha Farms, former muck farms acquired by the District, are underway. As mentioned previously, the regulation schedules for the Ocklawaha Chain-of-Lakes are being revised to enhance environmental benefits.

Efforts continue to ensure that all point and nonpoint source dischargers are in compliance with existing environmental regulations. Best management plans have been developed and are being implemented for muck farms still operating in the basin. Results of nutrient budget and modeling studies will be used in development of pollutant load reduction goals for the basin. Interagency Coordination projects are assisting local governments in their development of Comprehensive Plans and environmental protection ordinances.

Informational and educational materials are being produced to educate the public about environmental problems in the UORB and the goals of the SWIM Program, and solicit active public support for, and participation in, SWIM and other resource planning and management efforts.

Goals have been defined for each of the priority issues, and specific strategies have been developed to address them. A total of 34 projects have been developed to implement the strategies of the UORB SWIM plan. Figures 1 through 5 present a schematic summary of timetables and budgets for the UORB SWIM Program. The period covered by this plan includes District fiscal years 1993-94 through 1996-97.

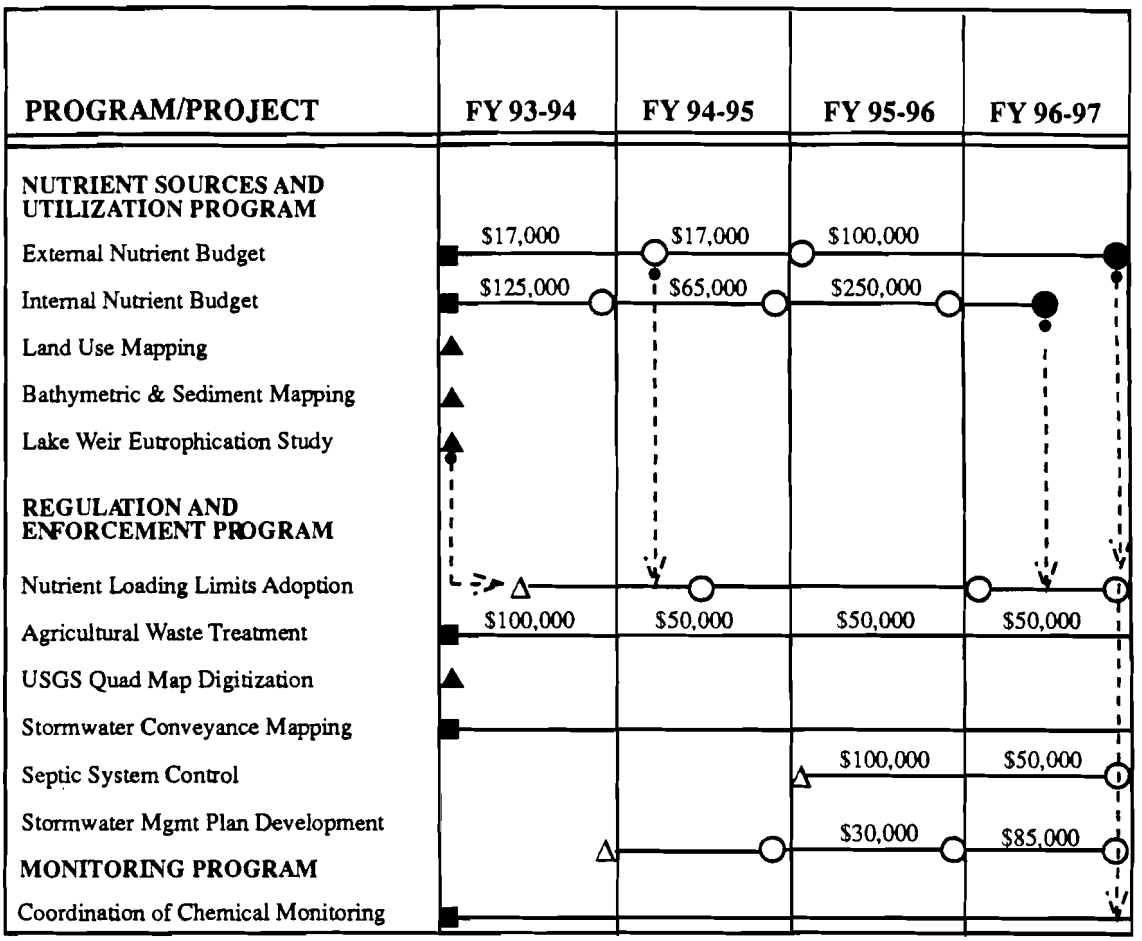

Figure 1. Flow Chart Summary-UORB SWIM Program.
Issue 1: Excessive Nutrient Levels in the UORB.

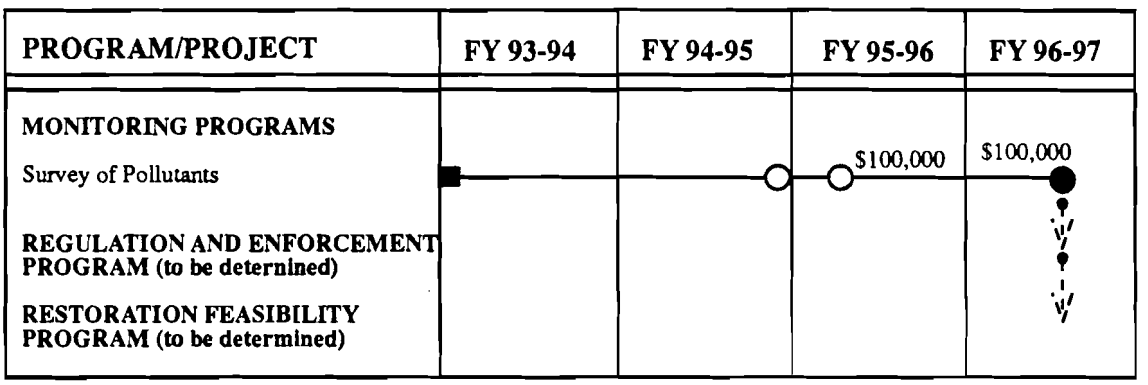

Figure 2. Flow Chart Summary - UORB SWIM Program
Issue 2: Potential Hazardous Levels of Metals and Organic Pollutants in the UORB.

KEY

$ Projected contractual encumbrances

● Project endpoint

■ Project begins pre-FY 93-94

▲ Project end pre-FY 93-94

◂···● Information transfer

Δ New project

○ Project milestone (contract, report)

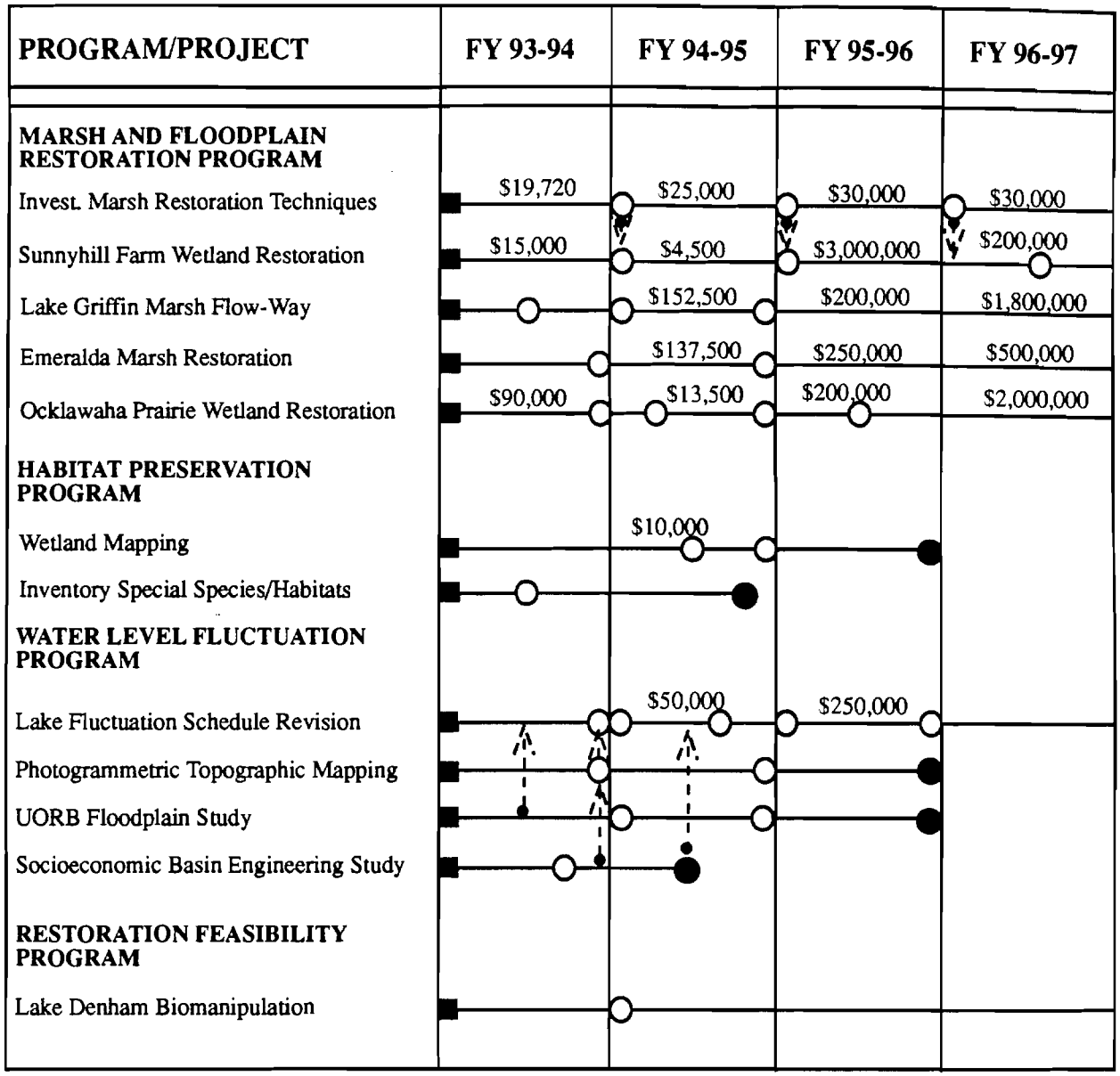

Figure 3. Flow Chart Summary-UORB SWIM Program.
Issue 3: Loss of wetland, shoreline, and other fish and wildlife habitat.

KEY

$	Projected contractual encumbrances	○	Project milestone (contract, report)
Δ	New project	■	Project begins pre-FY 93-94
▲	Project end pre-FY 93-94	<- ●	Information transfer
●	Project endpoint		

PROGRAM/PROJECT	FY 93-94	FY 94-95	FY 95-96	FY 96-97
INTERAGENCY COORDINATION PROGRAM				
SWIM Plan Education & Participation	■	○	○	○
Comprehensive Plan Development Support	■			○
Environmental Prot. Ordinance Devel.	■			
District Water Mgmt. Plan Devel.	■	○	○	

Figure 4. Flow Chart Summary - UORB SWIM Program.
Issue 4: Interagency Coordination in Management.

PROGRAM/PROJECT	FY 93-94	FY 94-95	FY 95-96	FY 96-97
COMMUNITY AWARENESS PROGRAM				
Creation/Distribution of Inform. Materials	■ $10,000	○ $21,000	○ $21,000	○ $21,000
PUBLIC INVOLVEMENT PROGRAM				
Public Participation Projects	■			
EDUCATION PROGRAM				
Coordinate School Programs	■	○ $10,000	○ $10,000	$10,000

Figure 5. Flow Chart Summary - UORB SWIM Program.
Issue 5: Public Awareness and Participation.

KEY

$	Projected contractual encumbrances	○	Project milestone (contract, report)
Δ	New project	■	Project begins pre-FY 93-94
	Project endpoint	<-●	Information transfer

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1. INTRODUCTION

THE SWIM ACT

The Surface Water Improvement and Management Act (SWIM Legislation-Chapter 87-97, Laws of Florida) was enacted in July 1987, in response to growing concerns over environmental degradation of Florida's surface waters. The legislature determined that the natural systems associated with many surface waters in the state have been altered so that they no longer perform important functions of aquatic systems, including (a) providing aesthetic and recreational opportunities, (b) providing habitat for native plants and wildlife, including endangered and threatened species, (c) providing safe drinking water, and (d) attracting visitors and accruing other economic benefits. Among the factors found to contribute to the decline in ecological, aesthetic, recreational, and economic value of the state's surface waters were: (a) point and nonpoint source pollution, and (b) destruction of the natural systems which purify surface waters and provide habitats.

The regional water management districts were directed by the legislature to design and implement programs for surface water improvement and management. The districts were mandated first to identify and prioritize water bodies of regional or statewide significance in need of restoration or conservation. The list of priority water bodies was to have been developed by 1 March 1988, giving consideration to criteria adopted by the Florida Department of Environmental Protection (FDEP) in Chapter 17-43.030 F.A.C. This list will be revised periodically.

Once the priority lists are established, the water management districts were mandated to develop and implement SWIM plans for restoration and conservation, in cooperation with FDEP, the Game and Fresh Water Fish Commission (FGFWFC), and local governments. Each plan is to contain written strategies, including activities, timetables, and expenditures, for restoring or conserving the water body.

SWIM plans shall be updated as necessary by the water management districts, but in no event later than every three years. This regular update provides continued opportunities for input and re-evaluation of the plans as the restoration and management programs develop.

The water management districts shall hold at least one public workshop in the vicinity of the water body under consideration to obtain public input prior to finalizing

the SWIM plans. The districts are required to adopt the plans at a public hearing. At least 30 days prior to any public hearing, the water management districts shall transmit the draft plan to FDEP, FGFWFC, the Department of Community Affairs, the Department of Agriculture and Consumer Services, and affected counties and municipalities. FDEP must establish a uniform format for SWIM plans, review the plans, and evaluate funding requests. In reviewing the plans, FDEP is required to make three specific determinations: (a) whether the costs described in the plan are reasonable estimates of actual costs of programs in the plan, (b) the likelihood of the programs described in the plan resulting in significant improvements in water quality, and (c) the combination of programs which can be funded based upon available resources in the SWIM Trust Fund.

RELATIONSHIP OF SWIM PLANNING TO OTHER MANAGEMENT EFFORTS

District Water Management Plans

District Water Managment Plans (DWMPs) are the water management district's comprehensive plans that will provide long-range guidance for the protection of water and related natural resources. State Water Policy (Chapter 17-40, F.A.C.) directed all five water management districts to develop these plans by November 1994, including identification of specific geographical areas with current or anticipated water resource problems and a course of action to address the problems.

The DWMPs incorporate information from recently completed and ongoing studies and projects as well as new initiatives. The DWMPs address four principal areas of responsibility: water supply, flood protection, water quality, and natural systems. SWIM plans and their associated projects are a major source of input for the surface water related sections of the DWMP.

An important aspect of the development of DWMPs is the work of the statewide Conventions Committees. Composed of representatives from each district and the FDEP, these committees were created to develop common definitions, methods, and standards for some of the fundamental components of water resource planning and management. Particularly relevant to the SWIM plans is the work of the Committee on Management of Surface Water Quality, which was charged with determining a consistent approach to the establishment of Pollutant Load Reduction Goals (PLRGs).

The Conventions Committee adopted definitions and schedules for the development of PLRGs. PLRGs are defined as estimated reductions in pollutant loadings needed to preserve or restore beneficial uses of receiving waters, with the ultimate primary purpose being that the water quality in receiving waters is restored or

maintained consistent with applicable state water quality standards. PLRGs are expected to be developed in two stages:

- 'Interim' PLRGs, which are best-judgement estimates of the levels of pollutant load reduction anticipated to result from planned corrective actions. Interim PLRGs are not necessarily intended to be sufficient for achieving and maintaining applicable water quality standards. They generally are based on preliminary estimates of pollutant loadings, and represent interim programmatic steps taken until more intensive investigations can be completed.
- 'Final' PLRGs, which are intended to be sufficient for achieving and maintaining applicable water quality standards, and which provide a basis for regulatory action, if necessary. These goals are based on thorough waterbody investigations, leading to a relatively high degree of confidence in the estimates of pollutant loading and the potential load removal efficiencies of planned corrective actions (District Water Management Plan - Conventions Committee on Management of Surface Water Quality 1993).

Interim PLRGs and schedules for development of final PLRGs were required to be included in updated SWIM Plans by December 31, 1994. The DWMPs also include the schedule and process for development of PLRGs for the water management district. The DWMPs also describe District activities to coordinate watershed management goals and PLRGs with state water management plans, local government comprehensive plans, and U.S. EPA's National Pollution Discharge Elimination System stormwater permitting.

PLRGs specific to the Upper Ocklawaha River Basin will be developed as part of the UORB SWIM program. This update plan includes interim PLRGs for the UORB. PLRGs are more fully discussed in Chapter 5 and in the description for Project OK-1-113-M (Nutrient loading limits adoption).

Local Government Comprehensive Plans

The development of local government comprehensive plans provides a good process to address many of the issues that have been identified for the Upper Ocklawaha River Basin. The 1985 state legislature adopted an extensive revision to the 1975 Planning Act, known as The Local Government Comprehensive Planning and Land Development Regulation Act. The act set out the contents of the plans, the procedures for adoption, the enforcement remedies available, and the penalties that can be applied if the local government fails to comply with these plans.

The growth management legislation makes it clear that the legislature assigns great importance to the proper preparation of local plans. Given its broad scope and the strong consistency requirements, there may be no action that a local government can take which

will have more impact on its constituents and its natural resources. These local plans are to be the blueprint for all future development and conservation activity within the jurisdiction of each local government. Once the plan is adopted, all decisions of the local government and all public and private development must be consistent with the plan. Although the plan can be amended, the plan will set the tone and direction for the community for at least the next five years.

State legislation sets out a series of required elements which every plan must include. Of the eight elements required in every plan, the future land use element, conservation element, the general sanitary sewer, solid waste, drainage, potable water, natural groundwater aquifer recharge element, and the intergovernmental coordination element provide means to address many water resource issues in the UORB. Table 1 identifies each element and water resource issues related to the SWIM program to be addressed by that element.

The water management districts are one of several state agencies that review and comment on local government comprehensive plans. The criteria for review of the plans are contained in Rule 9J-5 and Chapter 163 F.S. In addition to reviewing plans and plan amendments that are formally submitted to the District, the water management districts each have a program to assist local governments in the preparation of these plans. These review processes facilitate the inclusion of SWIM issues into local comprehensive plans and provide a basis for local government participation in addressing the issues through the creation of specific local ordinances.

Stormwater Planning

Stormwater issues are addressed at the local, regional, state, and national levels. Historically, stormwater concerns centered upon how to most expediently transport storm water from urban or agricultural areas to undeveloped areas. Recently, however, stormwater issues have been broadened to include water quality concerns, not just draining the land.

Stormwater management is most effective at the local level, since local governments permit and approve any new construction. Local government comprehensive plans provide an excellent opportunity for local governments to review their existing stormwater management programs, adopt policies to address deficiencies, and provide for coordination of regulations among adjacent local governments.

Regulatory Programs of Governmental Bodies

Regulation of water quality is delegated to the states under Section 401 of the Federal Clean Water Act. The state regulates surface water quality through the Wetland

Table 1. Water Resource Issues that Local Government Comprehensive Plan Elements Address

	Element		Issue
A.	Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Recharge Element	1.	Identification and correction of drainage facility deficiencies; stormwater management.
		2.	Coordination of future drainage needs among local governments.
		3.	Protection of the functions of natural drainage features.
		4.	Regulation of land use to enhance water quality of surface water bodies.
B.	Conservation Element	1.	Identification of natural resources (rivers, bays, wetlands, etc.) including DEP water quality classification where applicable.
		2.	Identification of floodplains.
		3.	Identification of soil conservation problems.
		4.	Identification of fisheries, wildlife, marine habitats, and vegetative communities.
		5.	Identification of known pollution problems and the potential for conservation of each resource.
		6.	Designation of environmentally sensitive lands for local protection.
		7.	Restriction of land use activities that have an adverse effect on the quantity and quality of water resources.
C.	Land Use Element	1.	Coordination of future land use with the findings of the other elements.

Resource Management (dredge & fill) and the Stormwater rules. The water management districts administer the Management and Storage of Surface Waters rule (MSSW) and the Stormwater rule. In addition, under a formal operating agreement with FDEP, the St. Johns River Water Management District administers a portion of the Wetland Resource Management program. Under the 1993 Streamlining Act, the MSSW, Stormwater, and Wetland Resource Management regulatory programs will be combined as Environmental Resource Permits.

County and Municipal governments have several regulatory means to address stormwater issues. The most direct means of stormwater regulation is through a local "Stormwater Management Ordinance". The effectiveness of such an ordinance depends on the permitting thresholds, the restrictiveness of the requirements, and the degree of inspection and enforcement established by the local government.

Recently, several local governments have shown interest in the establishment of a stormwater utility. A systematic approach to stormwater management at the local level creates a positive impact on the ability of local governments to plan and finance such improvements. Through the SWIM Program, the water management districts provide technical assistance and coordination among local jurisdictions in stormwater management.

Regional Planning Councils

Comprehensive regional policy plans link local government plans and the state comprehensive plan. In 1984, the State and Regional Planning Act mandated regional policy plans by each of Florida's eleven regional planning councils. Two of the regional planning councils have territory including the upper Ocklawaha River basin. They are the Withlacoochee Regional Planning Council (Marion and Sumter Counties) and the East Central Florida Regional Planning Council (Lake and Orange counties).

In 1984, the State and Regional Planning Act mandated that comprehensive regional policy plans be adopted by each planning council by July 1987. These regional plans link local government plans with the State Comprehensive Plan through a requirement for local plan consistency with both (Local Government Comprehensive Planning and Land Development Regulation Act).

Regional plans contain goals and policies addressing the following water resource related goals in the State Plan:

#8 Water Resources
#9 Coastal & Marine Resources
#10 Natural Systems and Recreational Lands
#13 Hazardous & Nonhazardous Materials & Waste

#14 Mining
#16 Land Use

Every three years each planning council must prepare an evaluation report to assess the successes and failures of its regional plan and provide a basis for revisions. In the spring of 1990 the District reviewed the regional plans and offered comments for use in these evaluation reports, at the request of the councils. Proposed amendments to these plans are expected this year and will be reviewed by the District's Planning Department.

Land Acquisition Program

The Water Management District Annual Five-Year Land Acquisition Plan update encompasses implementation of the "Save our Rivers" Program, as well as acquisition funded by District ad valorem taxes or state appropriation. In addition, the Preservation 2000 bill was enacted in 1990, providing additional funding for the water management districts, contingent on annual funding appropriated from the legislature. The evaluation criteria for this funding are broader than that for previous sources. Recommendations for acquisition are evaluated by the Land Resources Committee. Criteria used in evaluation of potential purchases include:

- Priority within a District water control project.
- Opportunity to improve water management, water supply, or conservation and protection of water resources.
- Environmental resource values.
- Endangerment.
- Human resource values.
- Manageability.
- Financial efficiency.

The general goal of District acquisitions, distilled from language in the "Save our Rivers" Legislation, is to preserve lands that produce high water resource and related environmental benefits, and to facilitate the restoration of altered systems from which such benefits have been lost. Parallel goals in the SWIM Act suggest the desirability of close coordination of basin acquisition planning with SWIM Programs. Land acquisition planning incorporates the goals of the SWIM Programs into the evaluation of potential acquisitions. In addition, the District cooperates with the Conservation and Recreation Lands (CARL) program, local governments, and private nonprofit organizations (such as the Nature Conservancy) to obtain lands within the basin for protection or restoration.

2. PRIORITIZATION OF SURFACE WATER BODIES IN THE SJRWMD

SWIM PRIORITY RANKING, 1988

The District completed prioritization of all surface water bodies of regional importance in 1988 (Lowe et al. 1988). Through this prioritization process, the subbasins of the UORB (Figure 6) were given a subbasin priority rank (Table 2).

The District arrived at this ranking by making three strategic decisions. The first decision was that water bodies were aggregated into hydologic units for prioritization. Drainage basins or subbasins would serve as management units for protection or restoration purposes. This provided a meaningful way of aggregating water bodies, which, if considered singly, may not be regionally significant, but may be of great regional significance when considered collectively. The use of drainage basins also provided a logical means of reducing the number of water bodies to be considered. The SJRWMD has a total land area of 12,000 square miles and contains more than 3,000 lakes and 250 named streams, creeks, and rivers. However, only 55 hydrologic units were required to delineate its surface water systems. For the prioritization process, the Upper Ocklawaha River Basin was divided into four ecologically interdependent subbasins (Figure 6). The use of hydrologic units also meant that no significant system would be without data. If individual water bodies were the units of evaluation, only about five percent could be prioritized since most water bodies have not been adequately sampled to provide data for prioritization.

The second strategic decision was that, in addition to the criteria provided by FDEP in Chapter 17-43.030 F.A.C., the basis for prioritization would include the relative ecological, economic, and recreational significance of each hydrologic unit. This recognized that we should restore or protect drainage basins based on which are of the highest value, not just which are the most degraded. It also provides a means of evaluating hydrologic units for which few or no data pertaining to the FDEP criteria exist.

The third decision was that restoration and protection should be given equal priority. This prioritization was accomplished by emphasizing the ecological, economic, and recreational significance of each hydrologic unit in the prioritization process.

Five criteria were used to determine the public and ecological importance of the subbasins: public use potential, public importance, environmental potential,

Figure 6. Subbasins of the UORB. Subbasin names and numbers are: 603 Haines Creek; 604 Hicks Ditch; 605 Lake Griffin; 606 Lake Griffin - State Road 40.

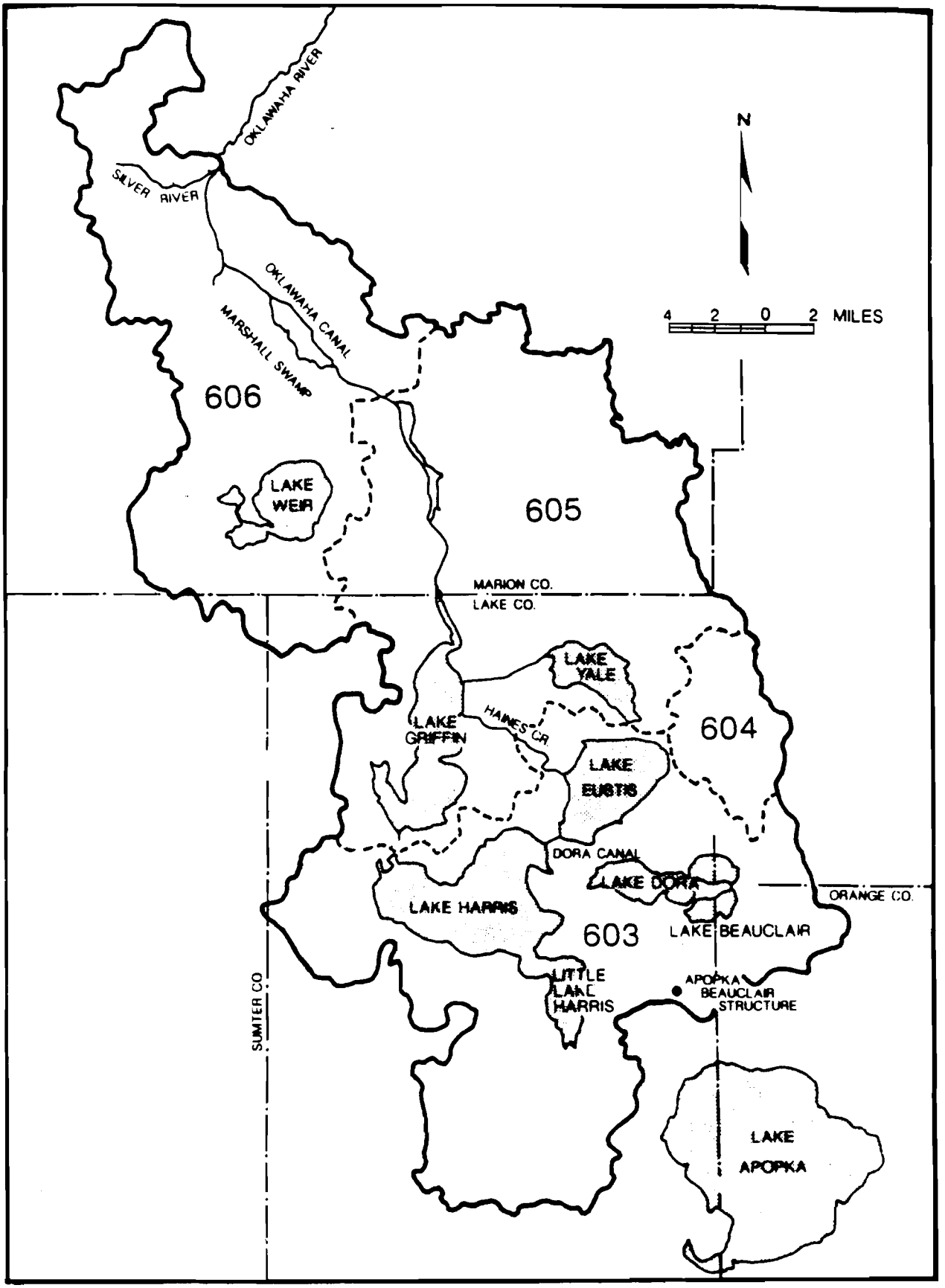


Table 2. UORB Subbasin Ranking Criteria (Lowe et al. 1988)

Subbasin Name	Sub Basin Number	Public Use Rank	Public Imp. Rank	Environ. Pot. Rank	Endanger/ Impair Rank	Natural/ Wildlife Rank	District Priority Rank	Priority Rank UORB
Haines Creek	603	6	3	2	12	17.5	2	1
Lake Griffin	605	16	5.5	3	18	4	4	2
Lake Griffin - SR40	606	23	7.5	5	24	20	7	3
Hicks Ditch	604	36	26.5	36	26	35	39	4

endangerment and impairment, and natural and wildlife significance. The elements used to evaluate each of these criteria are as follows (Lowe et al. 1988):

Public Use Potential: This criterion evaluated the importance of the water resources within a subbasin for public use based upon accessibility of the waterbodies to the general public and/or private groups; the existence of boat ramps; the potential for recreational use; and FDNR's user occasion ranking.

Public Importance: This criterion evaluated the importance of the water resources within the subbasin to the public based upon the number of waterbodies designated for special use or management by national, state or local governments. The designations utilized to indicate special public importance were Conservation and Recreation Lands (CARL); state park; state recreation area; national forest; county or municipal park; national forest recreation area; FGFWFC top fishing location; Save Our Rivers Lands; FGFWFC fish management area; and Outstanding Florida Water. In addition, the acres of water surface treated for aquatic weeds was used.

Environmental Potential: This criterion evaluated the general environmental potential of the water resources within a subbasin based upon the total surface water area within the subbasin; the total number of river or stream miles; and the connectedness of the waterbodies within the subbasin.

Endangerment Impairment Index: This criterion evaluated any ecological degradation based upon the number and volume of point source discharges; fish kill incidence; acres requiring spraying for control of exotic aquatic plants; trophic state index; and water quality compared to its' designated use standards. It utilized most of the criteria provided by FDEP in Chapter 17-43.030, F.A.C.

Natural and Wildlife Significance: This criterion evaluated the unique natural and wildlife value of the subbasin. The designations used were national wildlife refuge; state preserve; state aquatic preserve; state wildlife management area; manatee sanctuary; scenic or wild river; alligator harvesting area; waterfowl mid-wintering site; colonial nesting bird colony site; threatened or endangered species site; critical habitat; manatee migratory waterway; and environmentally endangered lands.

The subbasin priority ranking was determined by combining the rankings of each of the five criteria discussed above. The results for the UORB are shown in Table 2. Several subbasins within the UORB ranked relatively high. The Haines Creek subbasin (603) ranked second in the entire SJRWMD. The high rank that other subbasins in the Ocklawaha River basin received, most notably Lake Griffin (605) ranking fourth, Lake Griffin to State Road 40 (606) ranking seventh, and the Palatlakaha River (601) ranking twelth, reflects the environmental and public significance of this entire basin.

The ranking of the subbasins was not strictly followed in establishing the priority list because the subbasins were also evaluated to consider associated subbasins in the surface water system. Hicks Ditch (604), part of the UORB, ranked low in the priority list, but a management plan for the upper Ocklawaha would be incomplete if it failed to include the Hicks Ditch tributary.

As a result of the District's priority setting process, the UORB was ranked fourth in the SJRWMD for restoration and preservation under the SWIM program. The only areas of higher priority were the three subbasins identified in the SWIM Act by the legislature: the lower St. Johns River basin, the Indian River Lagoon, and the Lake Apopka subbasin.

SWIM PRIORITY RANKING, 1991

Surface water bodies not previously selected for SWIM programs were reprioritized in 1991 (Adamus, 1991). The revised priority ranking used an approach similar to the previous ranking. Water bodies in the district were again aggregated into hydrologic units for prioritization. Environmental significance was evaluated based on a revised list of socioeconomic, ecological, and management criteria. The criteria were grouped under the following categories:

- Public use
- Economic importance
- Public importance
- Natural and wildlife significance
- Environmental potential
- Degree of impairment
- Degree of endangerment

Numerical assessments of each subbasin were conducted based on the criteria in these categories, and subbasins were ranked by total scores for each subbasin. Subbasins were then aggregated into larger management units, based on their hydrologic associations, and these management units were prioritized for future development of new SWIM programs.

Surface water bodies previously selected for SWIM programs (including the UORB) were not included in the 1991 reprioritization.

3. OVERVIEW OF THE UPPER OCKLAWAHA RIVER BASIN (UORB)

DESCRIPTION OF THE WATER BODY SYSTEM

The Ocklawaha River system is a major surface water basin located near the center of peninsular Florida. For ease of investigation, it has been divided into seven hydrologic units which include (1) the Palatlakaha River; (2) Lake Apopka; (3 and 4) the upper Ocklawaha River; (5) the lower Ocklawaha River; (6) the Florida Ridge; and (7) Newnans Lake, Lochloosa Lake, and Orange Lake (Figure 7).

The UORB is located in Marion, Lake, Orange and Sumter counties of central peninsular Florida (Figure 8). The drainage basin encompasses 638 square miles, extending from the Apopka-Beauclair water control structure north of Lake Apopka to State Road 40 (SR40) near Ocala. The UORB can be partitioned, at the Burrell water control structure, into northern and southern regions. The southern region (Figure 9) includes several interconnected lakes which comprise most of the Ocklawaha Chain of Lakes. Flow into this region originates from the Palatlakaha River subbasin and the Lake Apopka subbasin (Figure 7). Virtually all the surface water flow is regulated by water control structures. These structures have altered the natural periodic fluctuations in lake stages and stream discharges. As a result, the lakes function hydrologically as managed reservoirs rather than natural water bodies.

The northern region of the UORB (Figure 10) is a lake and riverine system. Surface water inflow occurs from upstream drainage through Haines Creek; the Lake Yale drainage; the Lake Weir and Marshall Swamp drainage; and the Silver River. From Lake Griffin, water flows northward through what was historically marshland and then into the J.D. Young Canal (C-231). The canal extends approximately eight miles downstream to the Moss Bluff water control structure which controls water levels in Lake Griffin. Most of the river between Lake Griffin and SR40 has been channelized. Flow has been altered from the natural river course into canals for most of this reach, and much of the floodplain was converted to farmland.

The UORB lies primarily within the Central Lakes Subdivision of the Central Lake District (Brooks, 1982). The Central Lakes Subdivision is a large, lowland area between the Mount Dora Ridge on the east and the Ocala Uplift District on the west (Figure 11); having soluble calcareous bedrock and rich soils. In many areas, the valley floor intersects the potentiometric surface resulting in numerous springs and spring-fed lakes. As a result, surface waters receive a considerable portion of their total water budget from

Figure 7. Oklawaha River Basin. Numbers indicate hydrologic units described in the text.

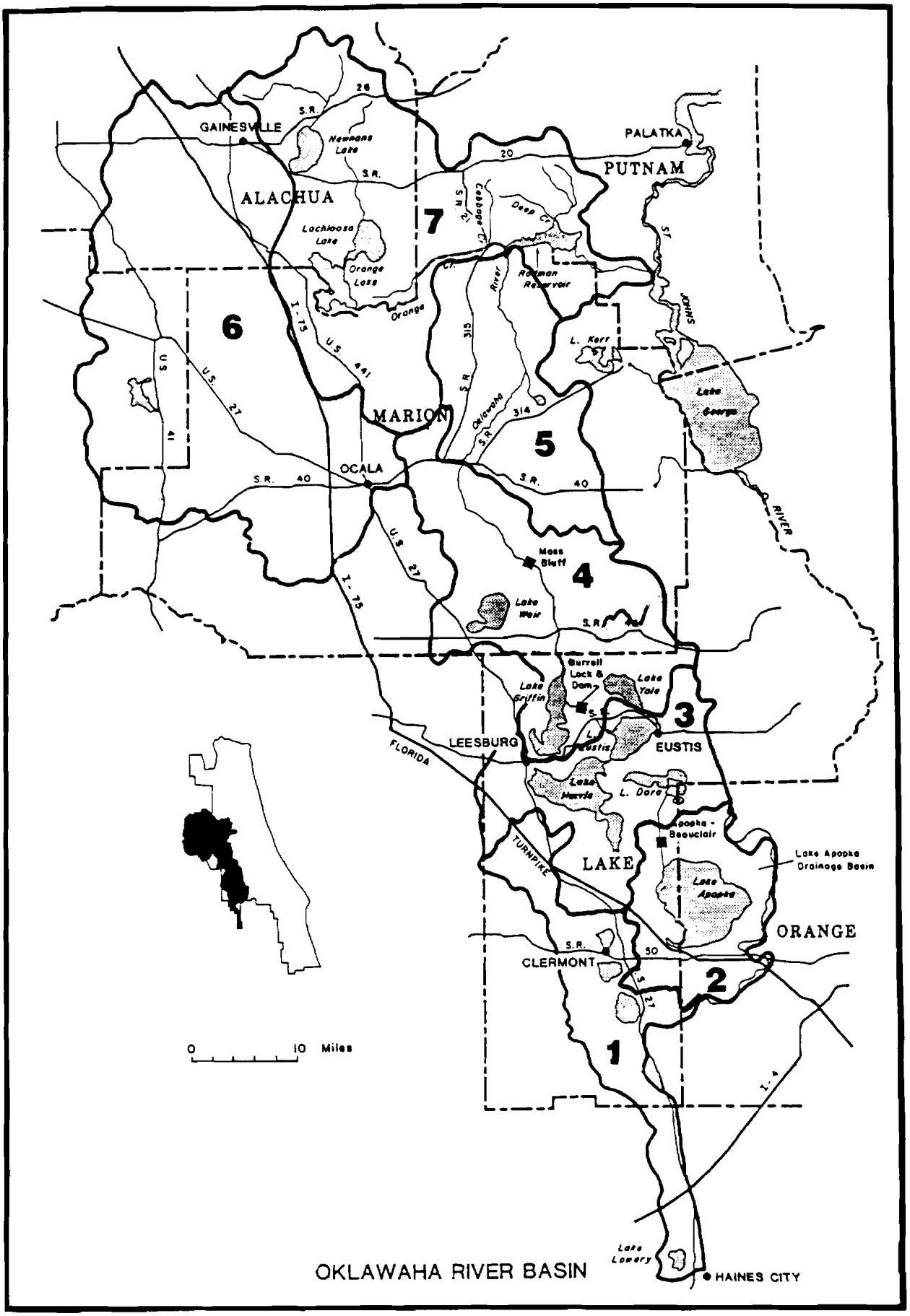


Figure 8. Upper Oklawaha River Basin (UORB).

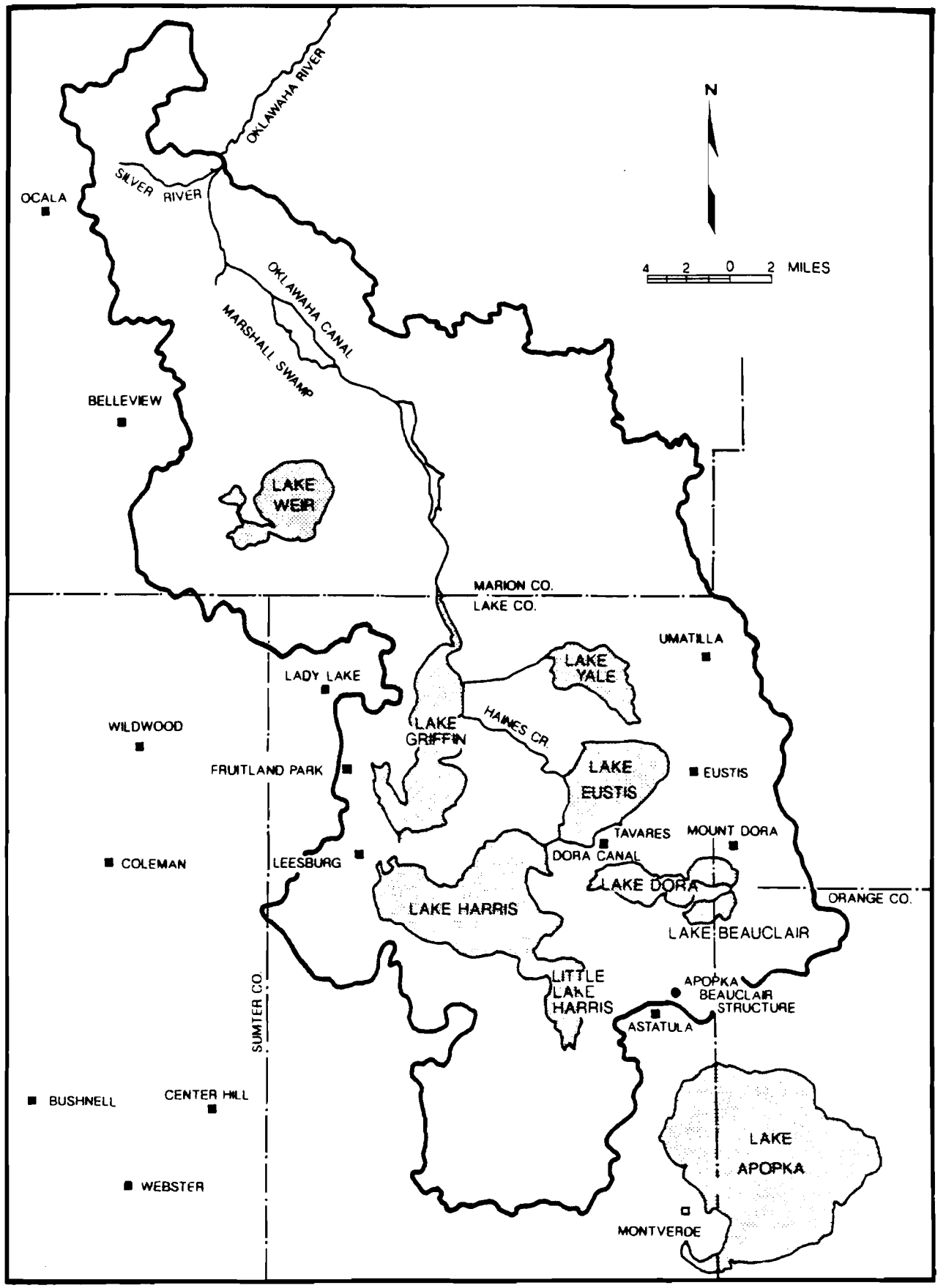


Figure 9. Southern region of the UORB, Oklawaha Chain of Lakes.

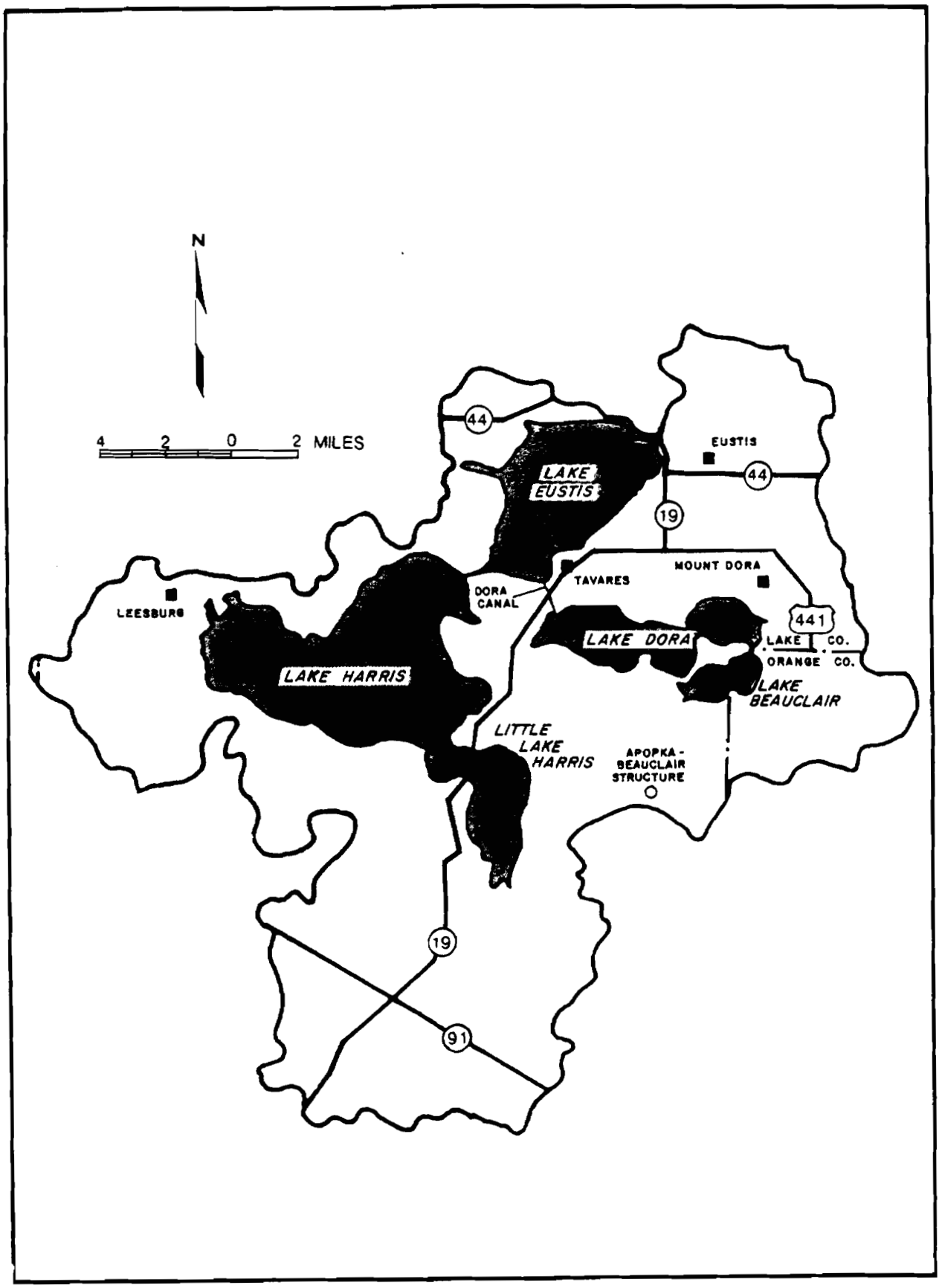


Figure 10. Northern region of the UORB.

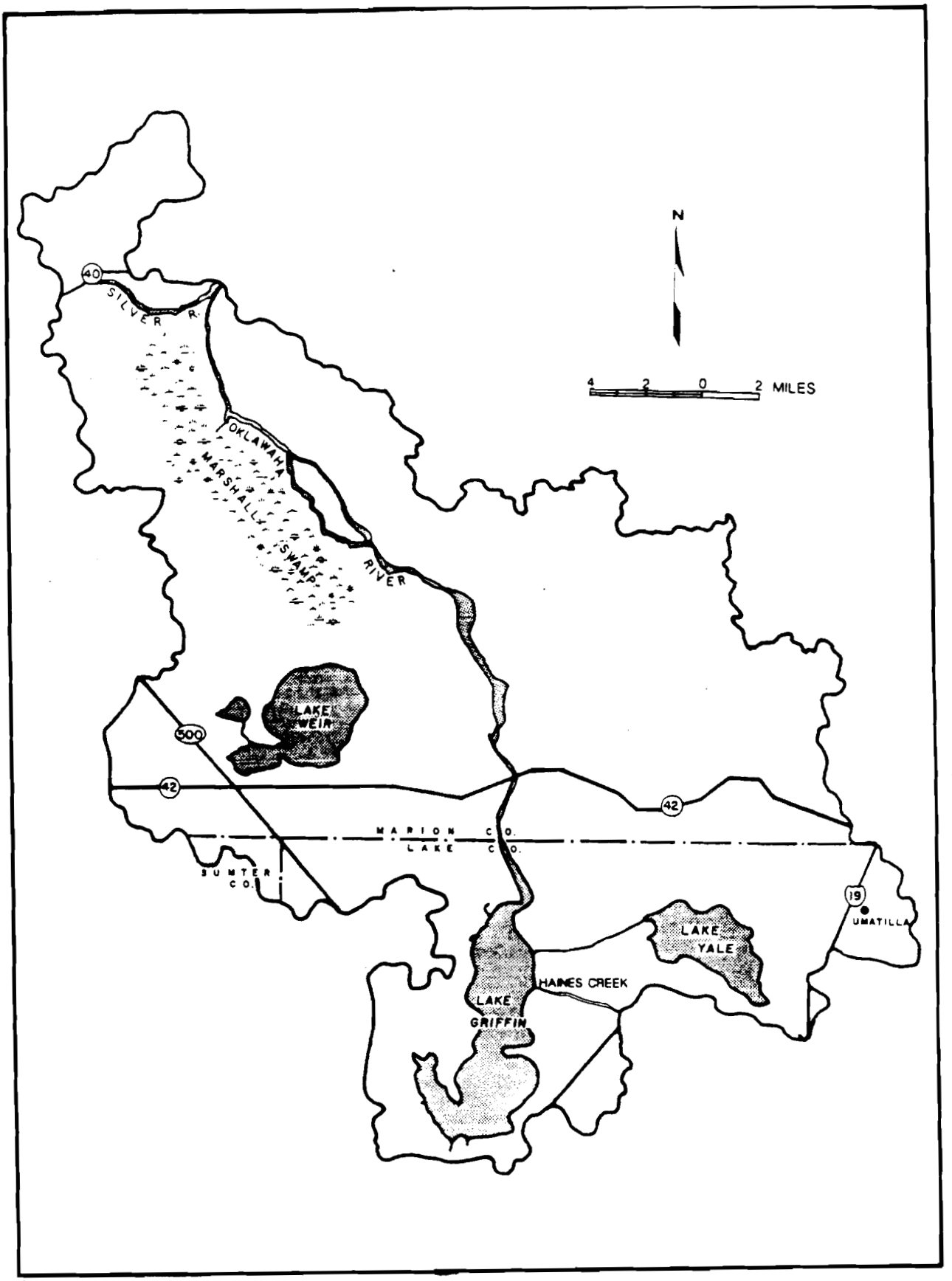
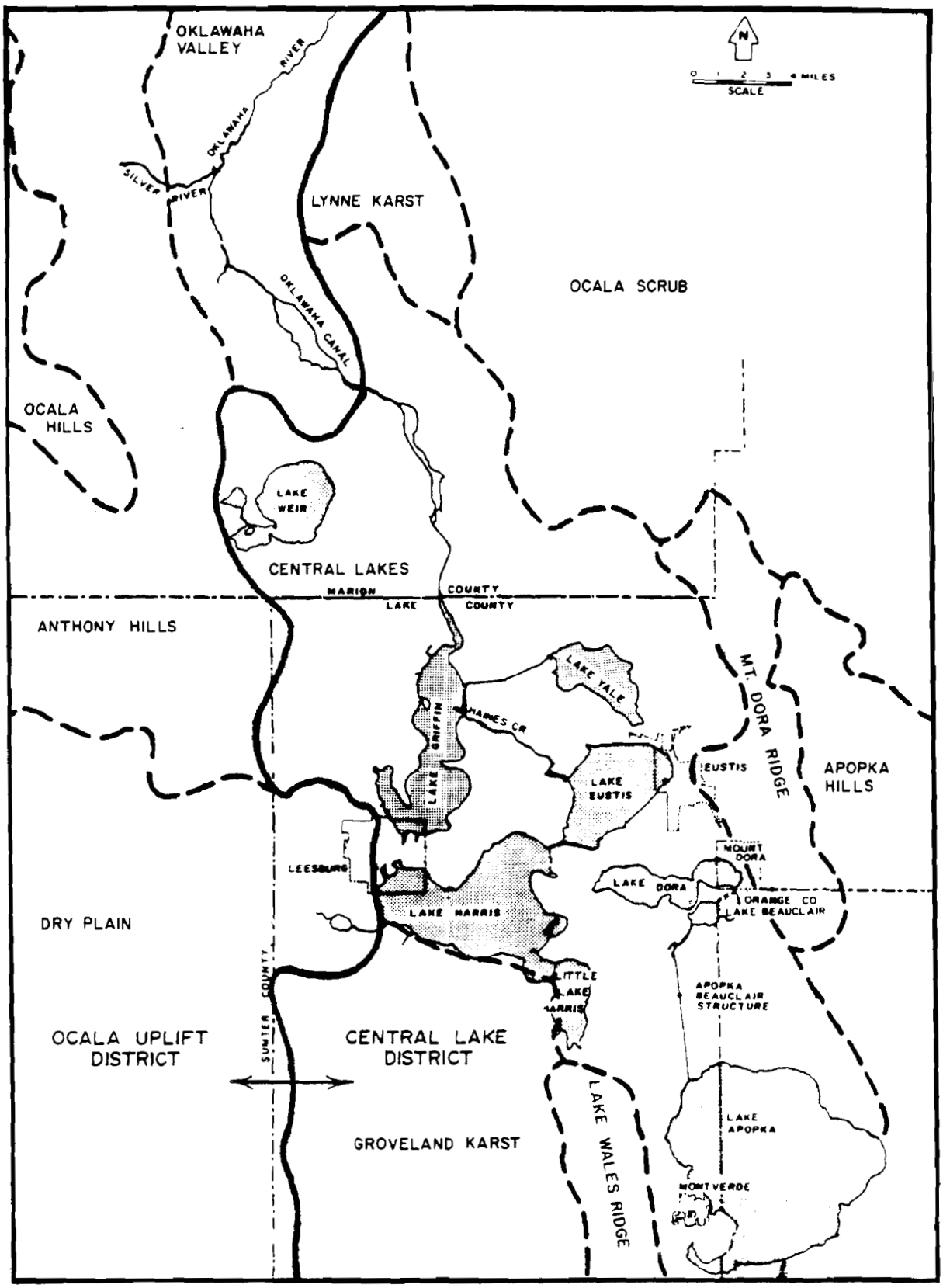


Figure 11. Physiographic subdivisions within the UORB.



mineralized ground water (Canfield, 1981). In addition, surface inflows for the region generally originate in calcareous, nutrient-rich soils. Consequently, the lakes of the region, with few exceptions, are considered to be naturally productive, hardwater lakes. Based on samples collected between 1967 and 1980, most of the lakes have been characterized as eutrophic; only Lakes Yale and Weir were classified in the less productive, mesotrophic category (Shannon and Brezonik, 1972; Canfield, 1981).

Although the lakes are naturally productive, rapid urbanization and intensive agricultural practices have substantially increased the surface water loading rate of nutrients. Consequently, productivity has increased to detrimental levels while aesthetic, recreational, and commercial benefits of the region's aquatic resources have continued to decline.

HISTORICAL AND CURRENT USES OF THE AQUATIC RESOURCES

The basin's waterways were historically used for transportation routes and agricultural and domestic water supplies. Prior to the development of the railroad, shipping was the primary means for hauling goods. Lumber, citrus, and passengers were the most frequent cargos. In addition, the lakes and rivers were used for subsistence fishing and hunting. This practice, while still active, has declined during this century.

Today navigation remains the primary demand on the aquatic resources. However, the emphasis is on recreation rather than commerce. The lakes and river provide resources for sport fishing, sport hunting, pleasure boating, and water sports. The pressure for aquatic recreation will increase as the regional population increases.

HISTORICAL PERSPECTIVE

During the late 1800s, resources in the upper Ocklawaha River basin were developed for tourism, and agricultural and commercial industry, as barge and steamship traffic increased. Visitors were attracted to the region for its outstanding fishing and other aquatic related recreation. The construction of water control structures and channelization of the river began as early as 1893, to facilitate navigation. The present configuration of locks and dams was completed in 1974.

The impacts of urban development within the basin were first documented during the late 1940s. Eutrophication of the surface waters resulted from discharge of domestic, industrial, and agricultural wastes directly to receiving waters, destruction of aquatic habitat, and channelization. Declining regional water quality persists.

Table 3. Chronology of significant events in the study area.

Year(s)	Event
1826	The first of several government surveys for assessing the feasibility of excavating a canal across north Florida was authorized by Congress during the presidency of John Q. Adams
1870-80	The Apopka Canal Company attempts to dredge a canal connecting lakes Apopka, Beauclair, Dora and Eustis to the Ocklawaha River to drain farmland and open a transportation route to ship vegetables and citrus
1890	Congress authorizes the River and Harbor Act to provide a 4 foot channel from the mouth of the Ocklawaha River to Leesburg to facilitate navigation
1893	Canal connecting Lake Apopka through Lake Beauclair and Lake Dora, to Lake Eustis was completed by the Delta Canal Company
1907	River and Harbor Act includes provisions for a 6 foot channel to be dredged from the mouth of the Ocklawaha River to Silver Springs
1916	River and Harbor Act includes provisions to construct a lock and dam at Moss Bluff to regulate water levels in Lake Griffin and accept private canals along the Ocklawaha River in lieu of natural portions of the river bed
1920's	Direct discharge of primary and secondary sewage effluents and fruit processing wastes to the Chain-of-Lakes begins
1925	Construction of Moss Bluff Lock and Dam, and dredging of the Ocklawaha River and Lake Griffin to Leesburg is completed by the U.S. Army Corps of Engineers under the Ocklawaha River Navigation Project
1927	River and Harbor Act includes provisions to excavate a cross-Florida canal
1935	Work starts on excavating a cross-Florida sea level canal
1936	After $5,400,000 spent on clearing construction and excavation, work in the canal ended due to unfavorable reports from the Department of Commerce
1942	With the advent of World War II, the Cross-Florida Barge Canal Project was authorized by an Act of Congress to protect shipping
1942	Drainage water discharges from muck farm around Lake Apopka begin
1942-47	Expansion of agricultural activities in Lake Apopka basin
1947	Hurricane disturbances in Lake Apopka; first algae blooms reported in Apopka

Table 3. (Cont'd) Chronology of significant events in the study area

Year(s)	Event
1950	A wooden water control structure was constructed on the Apopka-Beauclair Canal by local interests to stabilize water levels on Lake Apopka and provide optimum levels for agricultural water supply and improved navigation
1956	A permanent water control structure was completed on the Apopka-Beauclair Canal by the Lake Apopka Authority, which was created under Chapter 28325, Laws of Florida, 1953, for the purpose of conserving and protecting the water resources of Orange County
1957	Burrell Lock and Dam, located approximately midway along Haines Creek, was built by the Ocklawaha Basin Recreation and Water Conservation and Control Authority to stabilize water levels on Lakes Griffin, Eustis, Dora, Beauclair, and Harris and provide optimum levels for agricultural water supply and improved navigation
1962	The Four River Basin Project was authorized by Congress under the Flood Control Act to provide for flood protection and solve water control problems
1964	Construction on the Cross-Florida Barge Canal began
1967	Lake County Pollution Control established
1968	Construction completed on Rodman Dam and Lake Ocklawaha started filling
1969-74	U.S. Army Corps of Engineers, working on the Four River Basins Project, completes construction on Moss Bluff Lock and Dam, Lake Griffin to Moss Bluff levee and canal, and Moss Bluff to the north end of Ocklawaha Farms agricultural area levee and canal
1969	No discharge rule adopted by Lake County Pollution Control
1970's	The discharge of most sewage treatment, food processing and industrial wastes to the Chain-of-Lakes ceases
1971	President Richard M. Nixon halted construction of the Cross-Florida Barge Canal citing potentially serious environmental damage
1978	Construction of new Burrell Lock and Dam water control structure completed
1979	The Lake Griffin Recreational Area receives Outstanding Florida Waters designation
1984	Drawdown of Lake Griffin
1985	Lake Apopka restoration project begins - feasibility and diagnostic studies initiated

Table 3. (Cont'd) Chronology of significant events in the study area.

Year(s)	Event
1987	The Silver River receives Outstanding Florida Waters designation
1987	The Surface Water Improvement and Management Act (SWIM) becomes law
1988	Acquisition of Sunnyhill Farm
1988	Consent order with A. Duda & Sons, Inc. to reduce nutrient loading to Lake Apopka
1989	Consent order with Zellwood Drainage & Water Control District to reduce nutrient loading to Lake Apopka
1989	SWIM Plans for the upper Ocklawaha River basin and Lake Apopka adopted by District Governing Board and approved by FDER
1990	Shad removed from Lake Denham to test for food-chain and nutrient removal effects
1991	Revision of UORB SWIM Plan
1991	Acquisition of Ocklawaha Farms
1991	Pilot-scale Lake Apopka demonstration marsh flow-way begins operation period to test efficiency of marsh filtration
1991-93	Acquisition of Emeralda Marsh muck farms; flooding and gamefish stocking of properties
1992	Sunnyhill Farm Phase I restoration construction completed
1994	Initiation of pilot Lake Griffin marsh flow-way project

The UORB has been affected by a number of events which have led to water quality degradation and loss of aquatic habitat. Table 3 presents a brief chronology of significant events occurring in the basin (modified from USEPA, 1979; Shofner, 1982).

PHYSIOGRAPHY

The upper Ocklawaha River basin is located in the Florida Section of the Coastal Plain Physiographic Province. This area of depositional limestone is called the Florida Structure Platform where the dissolution of limestone determines the topographic relief. Physiographic subdivisions of the Florida Section include the Central Lake District and the Ocala Uplift District (Brooks, 1982, Figure 11).

The Central Lake District is a sand hill karst with dissolution basins and is the predominant physiographic district in the study area (Brooks, 1982). Subdivisions within the Central Lake District include:

- Lynne Karst - an area of slight relief having sand hills and lakes.
- Ocala Scrub - primarily an area of sand dunes and sand pines; the western edge is deeply weathered with sand and gravel deposits without a sand dune cover.
- Central Lakes - an area of large dissolution basins which includes all the Ocklawaha Chain of Lakes.
- Mt. Dora Ridge - a subdivision of the Apopka Upland subdivision consisting of linearly oriented sand hills.
- Apopka Hills - a subdivision of the Apopka Upland subdivision where the sand hills contain a greater apportionment of silt and clay than the Mt. Dora Ridge.
- Lake Wales Ridge - the topographic crest of Central Florida consisting of very high sand hills and relic beach ridges.
- Groveland Karst - an area of linearly oriented low sand hills and dissolution lakes.

The Ocala Uplift District is a broad uplift of limestone which lies at or near the surface; this low, rolling limestone landscape exists around Ocala. Subdivisions within the Ocala Uplift District include:

- Ocala Hills - an area of isolated, high hills
- Anthony Hills - an area where low hills contain sands and clayey sands.
- Dry Plain - an area where a thin covering of sand overlies limestone; only during wet periods do temporary lakes fill in the dissolution depressions.

Geology

The study area is underlain by a thick sequence of varied sedimentary lithologies. Major deposits include the Avon Park Group, Ocala Group, Hawthorn Formation, and undifferentiated sediments (Lichtler, et al. 1968).

Karst terrains are present throughout the basin. Karst topography is irregular due to the solution activity of acidic surface water and/or ground water, which dissolves the carbonate rocks, forming cavities and allowing surficial subsidence. The principal Karst region in the basin is the Central Lake District (Figure 11).

Soils

Soil types were quantified throughout the UORB from the appropriate soil conservation surveys (USDA, SCS and UF Ag. Exp. Sta., 1975, 1979). A soil type summary of the UORB is found in Table 4. A soil type inventory map of the UORB is illustrated in Figure 12. Sandy droughty soils comprise 63.7% of the total area; well drained soils - 1.3%; moderately well to poorly drained soils - 18.8%; and poorly to very poorly drained soils - 16.3%.

Topography

Landforms generally run in a north-south orientation in the basin. Relief is the greatest in the very high sand hills of the Lake Wales Ridge. The ridge is the topographic crest of central Florida and is located south of Little Lake Harris. One area, Sugar Loaf Mountain, has two hills greater than 310 ft NGVD. Another area of some topographic relief is the Ocala Scrub area east of the Ocklawaha River in the Ocala National Forest. Here hills range from 130 to 160 ft NGVD. The Ocklawaha Chain of Lakes lie in a large area of dissolution basins where relief is slight. Elevations there range between 60 and 70 ft NGVD with a few hills exceeding 100 ft (Brooks, 1982).

Rivers, Streams, and Canals

The Ocklawaha River is the principal water course traversing the UORB basin. The river channel is situated almost entirely within Marion County with its headwaters originating in Lake and Polk Counties. At least 38 tributaries generate a dendritic stream pattern (Figure 13). An annotated list of the major tributaries is included in Appendix C.

Springs

The location of reported springs in the study area are shown in Figure 13 and described below. In addition, Howey Height Tributary (#2 in Figure 13) appears to be of

Table 4. Summary of Soil Types for the UORB

	Acreage	% of Total
AREAS DOMINATED BY SANDY DROUGHTY SOILS NOT SUBJECT TO FLOODING		
Astatula Association	32,200	9.1
Astatula-Apopka & Candler-Apopka Association	194,008	54.6
SUBTOTAL	226,208	63.7
AREAS DOMINATED BY WELL DRAINED SOILS NOT SUBJECT TO FLOODING		
Arrendo-Gainesville Association	3,500	1.0
Kendrick-Hague-Zuber Association	907	0.3
SUBTOTAL	4,407	1.3
AREAS DOMINATED BY MODERATELY WELL TO POORLY-DRAINED SOILS NOT SUBJECT TO FLOODING		
Sparr-Lochloosa-Tavares Association	9,990	2.8
Lynne-Pomona-Pompano Association	5,608	1.6
Eureka-Paisley-Eaton Association	16,286	4.6
Myakka-Sellers Association	8,308	2.3
Tavares-Myakka Association	17,305	4.9
Myakka-Placid-Swamp Association	7,289	2.1
Pomello-Paola Association	1,924	0.5
SUBTOTAL	66,710	18.8
AREAS DOMINATED BY POORLY AND VERY POORLY DRAINED SOILS SUBJECT TO FLOODING		
Bluff-Martel Association	6,103	1.7
Anclote-Iberia, var.-Emeralda	8,294	2.3
Montverde-Ocoee-Brighton & Okeechobee-Terra Ceia-Tomoka Association	42,893	12.1
Swamp Association	696	0.2
SUBTOTAL	57,986	16.3

Figure 12. Inventory of soil types within the UORB

LEGEND

AREAS DOMINATED BY SANDY DROUGHTY SOILS NOT SUBJECT TO FLOODING


Astatula association


Astatula-Apopka & Candler-Apopka association

AREAS DOMINATED BY WELL DRAINED SOILS NOT SUBJECT TO FLOODING


Arrendondo-Gainesville association


Kendrick-Hague-Zuber association

AREAS DOMINATED BY MODERATELY WELL TO POORLY DRAINED SOILS NOT SUBJECT TO FLOODING


Sparr-Lochloosa-Tavares association


Lynne-Pomona-Pompano association


Eureka-Paisley-Eaton association


Myakka-Sellers association


Tavares-Myakka association


Myakka-Placid-Swamp association


Pomello-Paola association

AREAS DOMINATED BY POORLY AND VERY POORLY DRAINED SOILS SUBJECT TO FLOODING

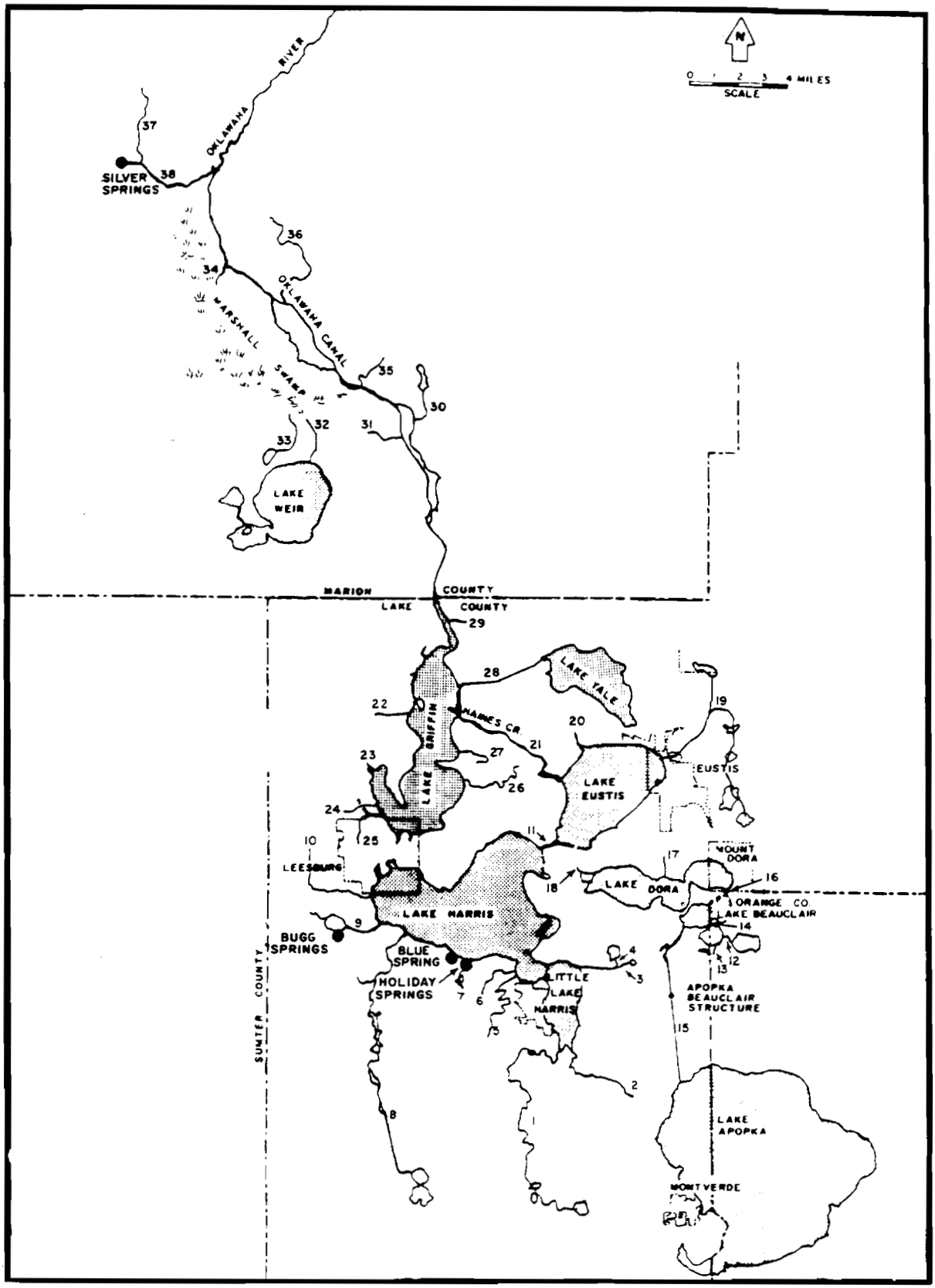

Bluff-Martel association


Anclote-Iberia, var.-Emeralda association


Montverde-Ocoee-Brighton & Okeechobee-Terra Ceia-Tomoka association


Swamp association

Figure 13. Major tributaries and springs of the UORB. These are identified by number in Appendix C.



groundwater origin.

- Silver Springs - a first-magnitude spring located east of Ocala and is the largest non-coastal spring in Florida. The average flow out of Silver Springs is 812 cfs, or 524 million gallons per day (Snell and Anderson, 1970). There are several smaller springs within 3,500 feet of the main discharge point. Silver Springs and its associated smaller springs discharge into the Silver River.
- Bugg Spring - located southwest of Leesburg and north of Okahumpka, is an artesian flow from the Floridan aquifer. Discharge is approximately 14 cfs (Knochenmus and Hughes, 1976) into Lake Harris via a 2.2 mile stream (Helena Run).
- Blue Spring - located on the south shore of Lake Harris, about one mile northwest of Yalaha. The spring discharges through a 125 ft long, 30 in culvert into the lake. Measured discharge from the spring was 3.04 cfs on 30 March 1972 (Knochenmus and Hughes, 1976).
- Holiday Springs - located in Yalaha, discharges into Lake Harris via a quarter mile meandering run. The spring has an approximate discharge of 5 cfs (Knochenmus and Hughes, 1976).

Lakes

Major Lakes - The surface area, drainage area, presence of a surface water outlet, and location each lake having a surface area greater than one square mile (640 acres) are listed alphabetically in Table 5.

Minor Lakes - The surface areas, drainage areas, presence of a surface outlet, and locations of most lakes having a surface area less than one square mile (640 acres), are listed alphabetically in Appendix D.

HYDROLOGY

Climatology

The basin is characterized by long, warm, humid summers and cool, dry winters. Warm air from the Atlantic Ocean, Gulf of Mexico, and numerous inland lakes moderate the summer and winter temperatures. The average annual temperature is 71.8°F, while average daily winter and summer temperatures are 61 and 81.8°F, respectively. During the summer, the average daily maximum temperature is 91.5°F. Winter temperatures vary considerably from day to day due to the large cold, dry air masses approaching from the north.

Table 5. Morphometric data for the major lakes of the UORB.

Lake	Surface Area (sq. mile)	Drainage Area (sq. mile)	Surface Water Outlet	Location (Latitude, longitude)
Lake Beauclair	1.7	162	Yes[1]	28°46'24" 81°39'44"
Lake Dora	6.9	180	Yes[2]	28°47'46" 81°38'39"
Lake Eustis	12.2	523	Yes[3]	28°51'06" 81°41'29"
Lake Griffin	16.7	606	Yes[4]	28°51'48" 81°51'31"
Lake Harris and Little Lake Harris	27.6	298	Yes[5]	28°48'14" 81°52'24"
Lake Yale	6.3	32	Yes[6]	28°52'52" 81°42'21"
Lake Weir	9.0	20	Yes[7]	29°02'23" 81°55'44"

1. An open water connection to Lake Dora
2. An old channelized waterway connects to Lake Eustis
3. Haines Creek connects Lake Eustis to Lake Griffin
4. Lake Griffin marks the beginning of the Ocklawaha River
5. Dead River connects Lake Harris and Lake Eustis
6. Connected to Lake Griffin through the Yale-Griffin Canal
7. Partially controlled by a broad-crested weir in the outlet canal to Marshall Swamp

Precipitation

Average annual rainfall in the UORB is approximately 48 inches with wet summers and dry winters. Rainfall statistics for area monitoring stations at Lisbon, Ocala, and Clermont are summarized in Jenab et al. (1986) and Rao et al. (1986, 1988, 1989, 1990a, 1990b).

Surface Water Hydrology

Surface water flow through the Apopka-Beauclair Canal to State Road 40 subbasin (not including incident precipitation) originates from either the Clermont Chain of Lakes (i.e., the Palatlakaha River Subbasin) or the Ocklawaha Chain of Lakes. Gourd Neck Springs located in the southwest corner of Lake Apopka is considered the headwaters of the Ocklawaha Chain of Lakes. Water flows north through Lake Apopka into Lake Beauclair through the Apopka-Beauclair Canal. Lake Beauclair drains directly into Lake Dora, which drains into Lake Eustis through the Dora Canal. The Clermont Chain of Lakes drains into Lake Harris, which connects with Lake Eustis through the Dead River. Lake Eustis is connected to Lake Griffin by Haines Creek; Lake Yale is also connected to Lake Griffin by the Yale-Griffin Canal. The Ocklawaha River starts at the north end of Lake Griffin.

Flows and water levels in the UORB are largely controlled by water regulatory structures. Flow from the Palatlakaha River subbasin is controlled by a series of structures operated by the Lake County Water Authority. The Apopka-Beauclair Lock and Dam is operated by SJRWMD to regulate levels in Lake Apopka. Burrell Lock and Dam on Haines Creek is operated by SJRWMD to maintain a desired regulation range of 62 to 63.5 feet NGVD in Lake Eustis. Water elevations in lakes Harris, Little Harris, Dora, and Beauclair are also affected by the Burrell structure. SJRWMD operates the Moss Bluff Lock and Dam as the local sponsor for the Four River Basins Project in accordance with regulations prescribed by the U.S. Army Corps of Engineers to maintain a desired elevation range of 58 to 59.5 feet NGVD in Lake Griffin; this structure also influences water levels in Lake Yale. Lake Weir is partially controlled by a fixed crest weir which allows outflow through its outlet canal only when lake levels exceed 57.44 feet NGVD.

The water regulatory structures have altered the natural periodic fluctuations once seen in lake stages and stream discharges. In addition, the seasonal regulation schedules are nearly the opposite of natural seasonal fluctuations in water levels; the lakes are held at their lowest levels during the summer wet season in order to provide flood storage capacity. These alterations in the natural hydrological cycles may contribute to loss of habitat and deterioration in water quality in the basin.

Secondary subbasins within the UORB are shown in Figure 14. The drainage boundaries are specified as contributing (unshaded) or non-contributing (shaded) inflow. Non-contributing areas, comprising 32% of the total area, are typically upland lakes and/or wetlands landlocked by wide ridges. The surface water flow paths for contributing secondary subbasins are also shown in Figure 14.

Ground Water

Two aquifer systems occur in the study area -- the surficial aquifer system and the underlying Floridan aquifer system (Leve, 1968). The Floridan aquifer system is separated from the surficial aquifer system throughout most of the study area by the Hawthorn Formation. The Hawthorn Formation is rich in phosphorus, which may contribute to the natural high productivity of surface waters in the basin.

The surficial aquifer system is the permeable hydrogeologic unit contiguous with the land surface. It holds the water table with water generally under unconfined conditions. The water usually contains iron in sufficient quantities to give it a pronounced taste.

The underlying Floridan aquifer system is the regional water-yielding hydraulic unit. Water from the Floridan aquifer is generally good in quality and suitable for most domestic, small irrigation, and light industrial applications. Wells in the Floridan aquifer are usually cased from ground level to the top of the aquifer. The wells are then extended without casing into the aquifer to allow water to enter the open hole from the various layers.

General areas of recharge to the surficial aquifers and the Floridan occur in the upland ridges surrounding the UORB (Lichtler, 1972). The basin functions primarily as a discharge area through the major lakes and streams (SJRWMD, 1977).

FLORA AND FAUNA

Flora

Wetland plant communities in the UORB include submerged aquatic plants, hardwood swamp forests, cypress swamps, and marshes and wet prairies. Several plant species occurring in the UORB have been accorded special status by the state. These endangered or threatened plants are listed in Table 6. Coordination between the SJRWMD and the Florida Natural Areas Inventory is being pursued as FNAI has a statewide data base with locations of many species of concern. Further coordination will

Figure 14. Secondary subbasins and direction of surface water flow in the UORB. Dotted areas are non-contributing subbasins.

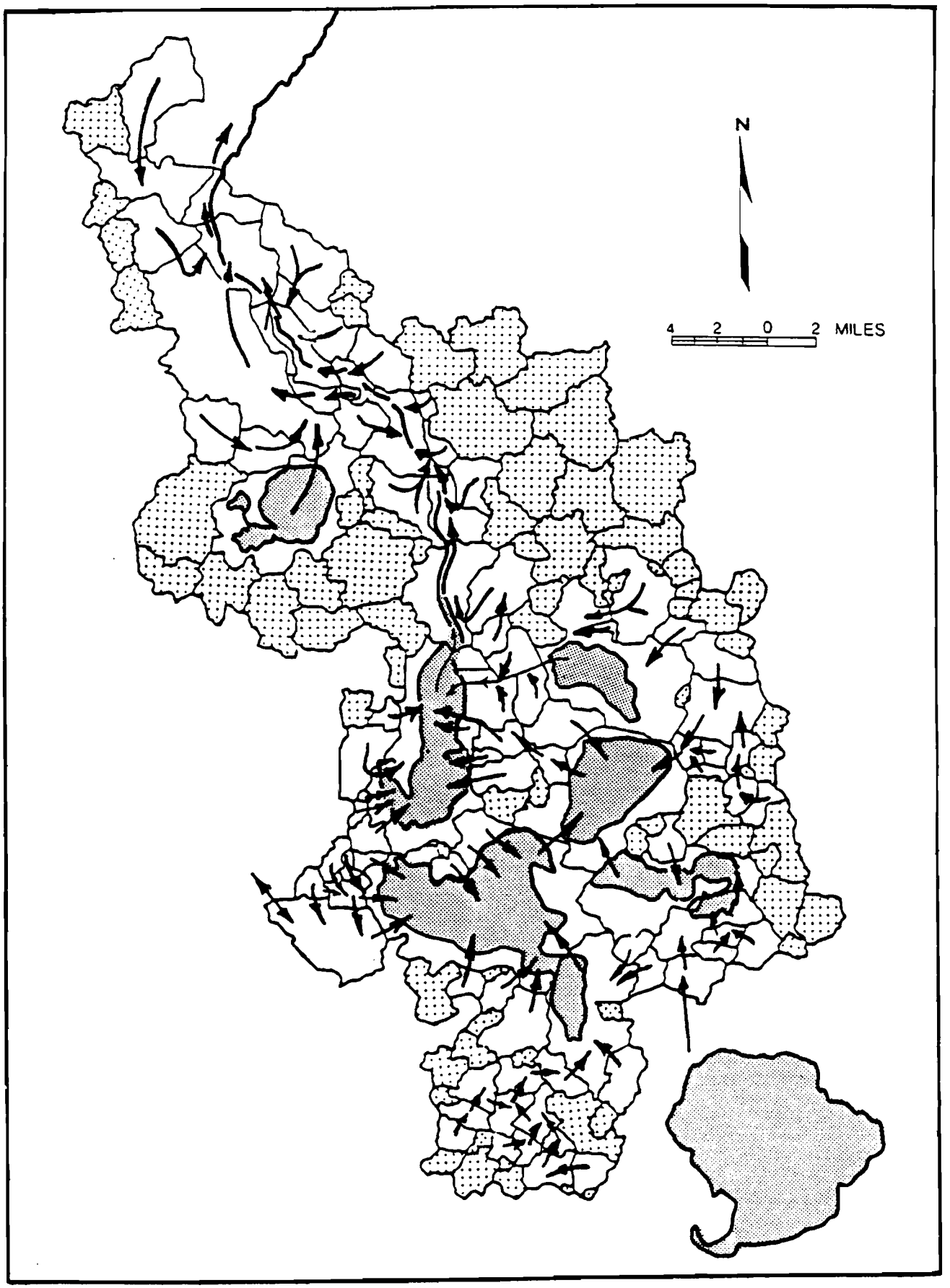


Table 6. Plant species granted special status.

Common Name	Scientific Name	Category
Venus-Hair (Fern)	*Adiantum capillus-veneris*	State Endangered
Florida Bonamia	*Bonamia grandiflora*	State Endangered Federal Threatened
Southern Grape Fern	*Botrychium biternatum*	State Threatened
Grape Fern	*Botrychium dissectum*	State Threatened
Winter Grape Fern	*Botrychium lunarioides*	State Threatened
Rattlesnake Fern	*Botrychium virginianum*	State Threatened
Longspurred Mint	*Dicerandra cornutissima*	State Endangered Federal Endangered
Water Sundew	*Drosera intermedia*	State Threatened
Florida Shield Fern	*Dryopteris ludoviciana*	State Threatened
Florida Quillwort	*Isoetes flaccida*	State Threatened
Cardinal Flower	*Lobelia cardinalis*	State Threatened
Bluestem Palmetto	*Sabal minor*	State Threatened
Pink-root	*Spigelia loganioides*	State Endangered
Air Plant	*Tillandsia bartramii*	State Threatened

be pursued with area universities and other sources that may have more comprehensive species inventories

Fauna

Between 100 and 125 species of aquatic insects are known to occur in the river system. Sixty-nine species of fish have been identified in the UORB (FGFWFC, personal communication). Of particular significance are the Lake Eustis pupfish (*Cyprinodon variegatus hubbsi*), which has been designated a "State Species of Special Concern", and the Southern tessellated darter (*Etheostoma olmstedi maculaticeps*), which is endemic to the Ocklawaha River and St. Johns River near Welaka, and has been designated a "State Species of Special Concern".

More than 300 species of vertebrates, exclusive of fish, indicate the ecosystem's diversity. Several animal species indigenous to the study area have been accorded special status by federal, state, and conservation organizations. These endangered or threatened animals are listed in Table 7. Coordination between the SJRWMD and the Florida Natural Areas Inventory is being pursued as FNAI has a statewide data base with locations of many species of concern. Further coordination will be pursued with area universities and other sources that may have more comprehensive species inventories.

LOCATIONS OF CITIES AND TOWNS

Locations of incorporated cities and towns within the UORB are shown in Figure 8. Their populations are listed in Table 8. The area has undergone rapid population growth. The population of Lake and Marion Counties more than tripled between 1960 and 1990.

LAND USE

Two land use maps have been develped for the basin. Land uses in the UORB were quantified by the District by updating the 1972 land use maps prepared by the Center for Wetlands, University of Florida, with 1984 color-infrared aerial photography (National High Altitude Photography, U.S.D.A., A.S.C.S.). An updated land use map was prepared by Geonex Martel, Inc., under contract from SJRWMD, using aerial photography flown in 1987-89. The land use, hierarchal classification system utilized is documented in Appendix B.

Table 7. Animal species granted special status.

Common Name	Scientific Name	Category
	Amphibians and Reptiles	
American Alligator	*Alligator mississippiensis*	State Species of Special Concern
Sand Skink	*Neoseps reynoldsi*	Federal Threatened State Threatened
Suwannee Cooter	*Chrysemys concinna suwanniensis*	State Species of Special Concern
Gopher Tortoise	*Gopherus polyphemus*	State Species of Special Concern
Indigo Snake	*Drymarchon corais*	State Threatened Federal Threatened
Short-tailed Snake	*Stilosoma extenuatum*	State Threatened
Florida Pine Snake	*Pituophis melanoleucus mugitus*	State Species of Special Concern
Gopher Frog	*Rana areolata*	State Species of Special Concern
	Birds	
Scrub Jay	*Aphelocoma coerulescens*	State Threatened Federal Threatened
Limpkin	*Aramus guarauna*	State Species of Special Concern
Burrowing Owl	*Athene cunicularia*	State Species of Special Concern
Little Blue Heron	*Egretta caerulea*	State Species of Special Concern
Snowy Egret	*Egretta thula*	State Species of Special Concern
Tricolored Heron	*Egretta tricolor*	State Species of Special Concern
Florida Sandhill Crane	*Grus canadensis pratensis*	State Threatened
Bald Eagle	*Haliaeetus leucocephalus*	State Threatened Federal Endangered
Southeastern Kestrel	*Falco sparverius paulus*	State Threatened
Wood Stork	*Mycteria americana*	State Endangered Federal Endangered
Red-Cockaded Woodpecker	*Picoides borealis*	State Threatened Federal Endangered
	Mammals	
Sherman's Fox Squirrel	*Sciurus niger shermani*	State Species of Special Concern
Florida Mouse	*Podomys floridanus*	State Species of Special Concern
Florida Black Bear	*Ursus americanus floridanus*	State Threatened
West Indian Manatee	*Trichechus manatus*	State Endangered Federal Endangered

Table 8. Population of cities and towns in the UORB. Data from the Florida Handbook 1989-1990, 1993-94 and United States Army Corps of Engineers (1992).

Locality	Year			
	1960	1970	1980	1990
Lake County				
Leesburg	11,172	11,869	13,191	14,903
Eustis	6,189	6,722	9,453	12,967
Mount Dora	3,756	4,543	5,883	7,196
Tavares	2,724	3,261	4,938	7,383
Fruitland Park	774	1,359	2,259	2,754
Umatilla	1,717	1,600	1,872	2,350
Astatula	357	388	755	981
Howey-in-the-Hills	402	466	626	724
Lady Lake	355	382	1,193	8,071
Bassville Park *	NA	NA	3,064	2,752
Marion County				
Ocala	13,598	22,583	37,170	42,045
Belleview	864	916	1,913	2,713
Silver Springs Shores *	NA	NA	3,983	6,421
Silver Springs *	NA	NA	1,082	NA
Orange County				
Zellwood *	NA	NA	1,760	NA

* Unincorporated town

Results of the land use evaluation are shown in Table 9 and the 1987-89 land use inventory map is illustrated in Figure 15. Agriculture and forest land are the major land uses within the UORB. However, recent trends are an increase in urbanized areas and a decrease in agriculture. The 1987-89 land use map does not reflect most of the recent purchases of muck farms in the basin by SJRWMD (approximately 16,500 acres, 4% of the total basin, most of which will be restored to wetlands and forest/rangeland).

Wetlands

Wetlands are defined in Chapter 373, F.S. as "those areas that are inundated or saturated by surface water or ground water at a frequency and a duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soils. Soils present in wetlands generally are classified as hydric or alluvial, or possess characteristics that are associated with reducing soil conditions. The prevalent vegetation in wetlands generally consists of facultative or obligate hydrophytic macrophytes that are typically adapted to areas having soil conditions described above. These species, due to morphological, physiological, or reproductive adaptations, have the ability to grow, reproduce or persist in aquatic environments or anaerobic soil conditions. Florida wetlands generally include swamps, marshes, bayheads, bogs, cypress domes and strands, sloughs, wet prairies, riverine swamps and marshes, hydric seepage slopes, tidal marshes, mangrove swamps and other similar areas." The UORB includes numerous wetlands that are hydrologically contiguous with the Ocklawaha River (Figure 16 and described below).

- Marshall Swamp. Marshall Swamp is a hardwood swamp with bayheads. Urbanization and forestry have altered the natural hydrology of the northern swamp by isolating the wetlands. A significant portion of the middle and lower swamp was once diked and drained for farming; however, some farming has ceased and the dike has been breached.
- North Lake Griffin Marsh. This fresh water marsh is approximately 3,000 acres and is north of Lake Griffin. This marsh borders on both banks of the Ocklawaha River from Lake Griffin to State Road 42.
- Goose Prairie. This fresh water marsh is approximately 500 acres and is located east northeast of Lisbon. The marsh is especially significant ecologically as the Florida Sandhill Crane is reported to have nests on the site.
- Emeralda Island Marsh. Emeralda Marsh is a fresh water marsh with an associated hardwood swamp approximately 1,200 acres in size, located northwest of Lisbon on the east side of the Ocklawaha River, northeast of Lake Griffin. The present size of the marsh is significantly smaller than its natural size due to large scale drainage for farming. Emeralda Marsh is also a nesting area for the Florida Sandhill Crane, as well as a major wintering area for migrating Sandhill Cranes.

Table 9. Land Use Summary for the UORB.

Land use	1984 Acreage	1984 % of Total	1987-89 Acreage	1987-89 % of Total
Urban and built up	48,786	12.0	62,818	15.4
Agriculture	130,358	31.9	112,011	27.4
Range land	8,522	2.1	8,186	2.0
Forest land	93,760	23.0	89,682	22.0
Water	67,356	16.5	65,333	16.0
Wetlands	57,988	14.2	65,006	15.9
Barren lands	436	0.1	1,115	0.3
Transportation, communication & utilities	879	0.2	2,417	0.6
Unmapped *			1,524	0.4
Total	408,085	100.0	408,092	100.0

* Areas in Sumter County (outside of SJRWMD boundaries) were not mapped in 1987-89.

Figure 15. Inventory of land use in the UORB.

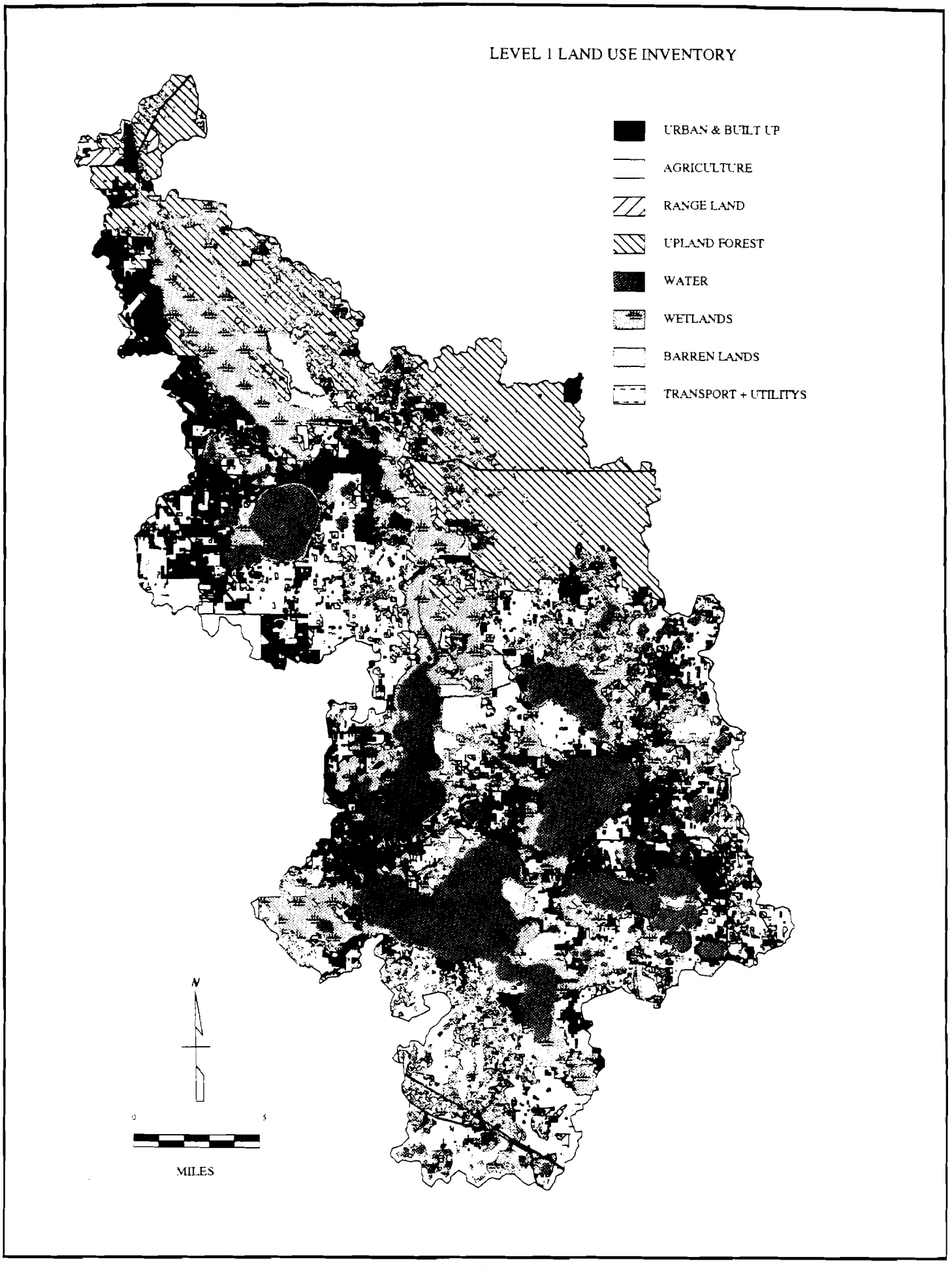
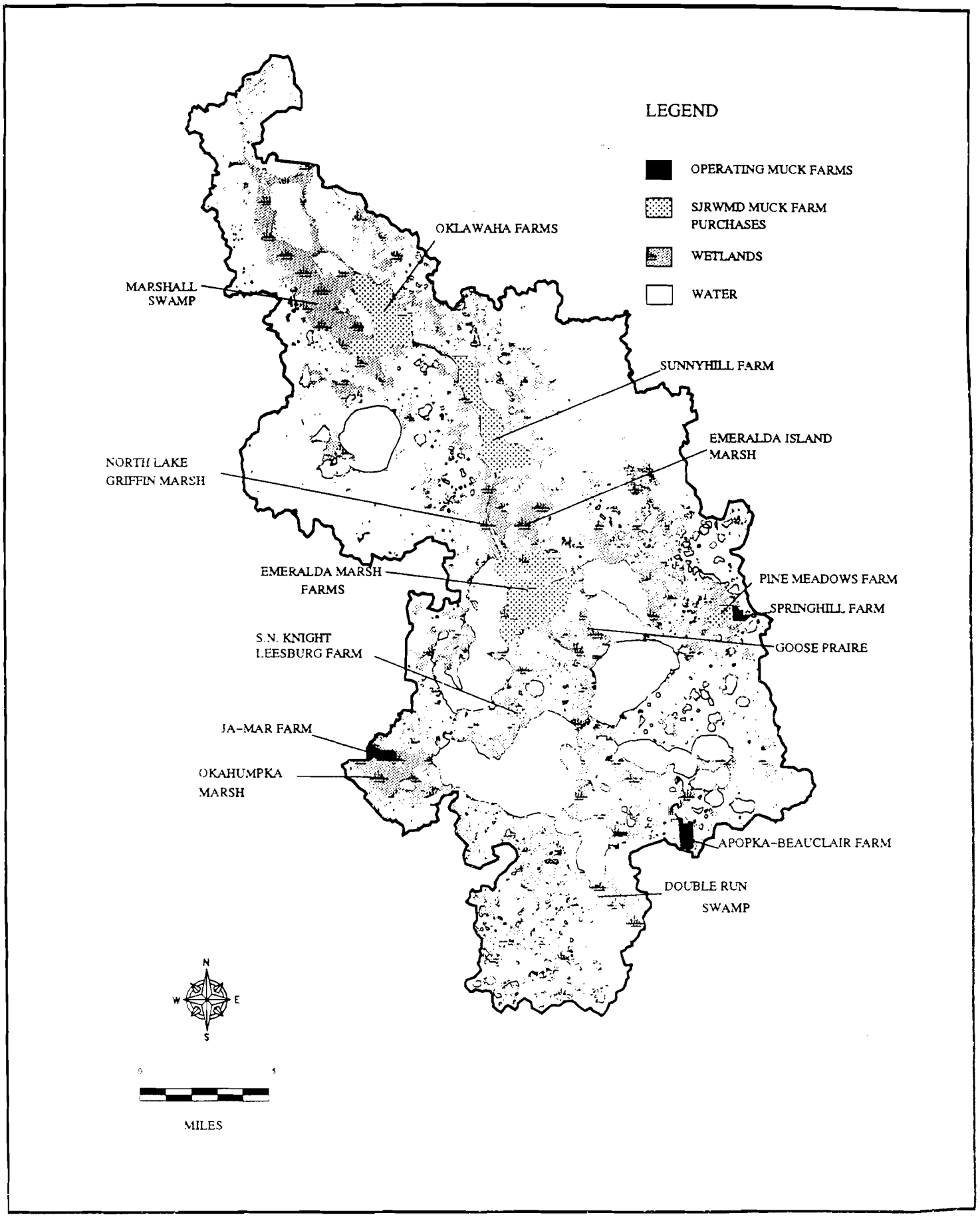


Figure 16. Major wetland areas, muck farms, and SJRWMD muck farm acquisitions in the UORB.



- Okahumpka Marsh. The Okahumpka Marsh is a 4,500 acre fresh water marsh and hardwood swamp located southwest of Leesburg. Bugg Spring contributes flow into the marsh and is located on its south side. The marsh discharges into both the Withlachoochee River Basin and the Ocklawaha River Basin.
- Double Run Swamp. The Double Run Swamp is a fresh water marsh with an associated hardwood swamp which includes several small springs. The swamp is approximately 1,000 acres and is located on the south end of Little Lake Harris, south of Astatula.

Agricultural Operations

Much of the agricultural land around the major lakes and the Ocklawaha River was developed on drained wetlands. These "muck farms" are often drained by interior drainage ditches, pump stations, and perimeter levees. A number of the muck farms in the basin have recently been acquired by SJRWMD. Upland farms were chiefly developed for citrus groves and these areas usually require minimal drainage. Muck farm areas in the basin are shown on Figure 16 and described below. Modica and Associates (undated) further describe agricultural operations in the basin.

Presently operating muck farms in the basin include:

- JA-MAR Farm. This area includes approximately 460 acres of muck farm; The farm is located northwest of Flat Island and 1 mile west of Leesburg, and drains into Lake Denham.
- Apopka-Beauclair Farm (J & L Farm). This area includes approximately 400 acres of muck farm located just east of the Apopka-Beauclair Canal.
- Springhill Farm. A part of the Lake Eustis drainage basin, this farm consists of about 230 acres. This farm relies on perimeter dikes, interior drainage canals, and pump stations to prevent inundation. The primary crops grown are silage crops and vegetables. The farm is located approximately 5.5 miles northeast of Eustis.

Muck farm areas acquired by SJRWMD include:

- Ocklawaha Farms. This property was acquired by the District in 1991. Part of the muck farm area has been leased back to the farmer through 1994. A conceptual management plan for the property has been completed. This property is 4400 acres with approximately 2,500 acres of organic soil (muck). Perimeter dikes, interior drainage canals, and pump stations prevent inundation. The primary crop grown was corn silage. The farm is east of Heather Island, just north of Moss Bluff.
- Sunnyhill Farm. This area was acquired by the District in 1988, and the historic floodplain and wetland habitats are being reestablished on the site. This area includes approximately 2,800 acres of former wetlands. This farm relied on perimeter dikes, interior drainage canals, and pump stations to prevent

inundation. Agricultural activities included a dairy farm and growing silage crops. The property is located immediately north of State Road 42, at Starks Ferry.

- Emeralda Marsh Farms. This area includes approximately 13,000 acres. Most of the farms in this area were acquired by the District in 1991-93, and restoration plans are under development. Parcels acquired include S.N. Knight-Lisbon Farms, Walker Ranch, Lowrie Brown Farm, Matthews Farm, Long Farm, Eustis Muck Farm, and Ashley Farm (inactive). These farms relied on perimeter dikes, interior drainage canals, and pump stations to prevent inundation. The primary crops grown were corn and silage crops. The farms are located in south Emeralda Island and north and south of Haines Creek.
- Pine Meadows Farm. One of two muck farms draining into Lake Eustis via Hicks Ditch, this property, comprising about 900 acres, was acquired by the District in 1992.
- S.N. Knight-Leesburg Farm. This area included approximately 400 acres of muck farms bordering Lake Harris, and was acquired by the District in 1991.

RECREATION AND PUBLIC USE

Ocklawaha Chain of Lakes

The Florida Game and Fresh Water Fish Commission has conducted creel surveys to document trends in the sport fishery in the Ocklawaha Chain of Lakes. The most recent surveys document a declining largemouth bass fishery. In Lake Harris, bass harvest and catch success declined substantially in 1988, although total catch remained high through 1990, due to record fishing effort. Fishing effort and catch declined dramatically in 1991. In Lake Griffin, fishing effort, catch, and success for largemouth bass substantially increased following a 1984 drawdown. However, by 1989 bass fishing effort and catch had declined to the low pre-drawdown levels. The benefits of a single drawdown to fish recruitment are expected to be temporary. Continuing management of habitat and water quality is necessary to maintain a healthy fishery.

Lake Griffin State Recreational Area is located at the northwest end of an embayment in the southwest corner on the lake. Boating activity is significant in the lakes as shown by the numerous marinas and fish camps. An estimate of boating activity in the Chain of Lakes can be inferred from the number of persons to transit the locks in the basin (Table 10). Boating activity has generally declined in the past three years, perhaps reflecting the decrease in fishing activity and problems with lake access resulting from a drought in the last two years. Lowered activity in 1984 was evidently due to the drawdown of Lake Griffin.

Table 10. Summary of boating activity, upper Ocklawaha River basin. Source: Heaney et al. (1990), SJRWMD records

	Boating Passengers Through Locks		
Year	Apopka-Beauclair Canal	Haines Creek	Ocklawaha River at Moss Bluff
1978	1,662	33,271	14,844
1979	1,884	30,748	13,722
1980	1,511	31,073	13,687
1981	1,254	27,982	10,817
1982	1,825	31,433	14,823
1983	1,938	25,200	15,475
1984	1,973	14,553	6,655
1985	939	29,811	13,874
1986	1,320	26,586	21,008
1987	1,595	41,205	19,922
1988	2,323	48,970	21,407
1989	2,689	49,962	20,163
1990	2,548	48,559	20,815
1991	3,084	43,686	17,072
1992	2,292	38,903	14,138
1993	2,209	41,508	16,330

Ocklawaha River

Fishing and boating are popular recreational activities in the Ocklawaha River. Several Marion County businesses are based on boating activities. The Ocklawaha Canoe Outpost at Eureka rents canoes and kayaks for single and multiple day trips, averaging 1200 canoe rentals per year with two to three people per canoe. The Ocklawaha River and Silver Run Boat Company has weekday tours from Moss Bluff to Silver River. In 1986, approximately 750 persons used this service.

Other recreational organizations are active in the Ocklawaha River Basin, among them are Outward Bound, and Camp E-KEL-ETU of the Eckerd Wilderness Educational System. An estimate of boating activity on the river can be inferred from the number of persons to transit the locks at Moss Bluff (Table 10). Temporal trends in boating activity are very similar to those on Haines Creek.

Silver Springs Area

A county park is located near the confluence of the Silver and the Ocklawaha rivers and provides a boat ramp. Canoeing, snorkeling, SCUBA diving and observing nature are common recreational activities on the Silver River. Fishing is prohibited (Chapter 372.27) in the Silver River.

OUTSTANDING FLORIDA WATERS AND AQUATIC PRESERVES

Section 62-3.041 of the Florida Administrative Code designates Outstanding Florida Waters. Paragraph (1) (f) states, "The Commission may designate a water of the State as a Special Water after making a finding that the waters are of exceptional recreational or ecological significance and a finding that the environmental, social, and economic benefits of the action outweigh the environmental, social, and economic costs." Outstanding Florida Waters in the study area include Lake Griffin State Recreational Area (Lake County), Silver River State Park, the Silver River, and the Ocklawaha River north of Ocklawaha Farms (Marion County).

The Florida Aquatic Preserve Act of 1975, Chapter 258, F.S., defines Aquatic Preserves as exceptional areas of submerged lands and associated waters set aside for maintenance essentially in their natural or existing condition. Aquatic Preserves in the UORB are Lake Weir and the Ocklawaha River Aquatic Preserve, which includes the Ocklawaha and Silver rivers north of Ocklawaha Farms (see Figure 16).

POLLUTION SOURCES

Point sources of pollution within the UORB are listed in Table 11. Data were summarized for the UORB SWIM Plan from Central Florida District Office, Florida Department of Environmental Protection, St. Johns River Water Management District, and Lake County Environmental Services records.

An inventory of permitted non-point pollution sources (District management and storage of surface waters (MSSW) and stormwater permits) may be found in Appendix E. Data were summarized for the UORB SWIM Plan from St. Johns River Water Management District records.

There are no non-permitted pollution sources, based on data summarized for the UORB SWIM Plan from Central Florida District Office, Florida Department of Environmental Protection and Lake County Environmental Services records.

Pollution sources violating or potentially exceeding water quality standards are listed in Table 12. Data were summarized for the UORB SWIM Plan from Central Florida District Office, Florida Department of Environmental Protection and Lake County Environmental Services records.

Pollution sources operating with a temporary permit are listed in Table 13. Data were summarized for the UORB SWIM Plan from Central Florida District Office, Florida Department of Environmental Protection, the St. Johns River Water Management District, and Lake County Environmental Services records.

Based on records of the Water Management District, the Florida Department of Environmental Protection and Lake County Environmental Services, currently all pollution sources are in compliance with state standards, with the exception of those listed in Tables 12 and 13.

WATER QUALITY

We evaluated water quality for the UORB SWIM Plan using current water quality data collected by SJRWMD, Florida Department of Environmental Protection, Florida Game and Freshwater Fish Commission, United States Geological Survey, and Lake County Environmental Services. A Trophic State Index (TSI) and a Water Quality Index (WQI) were used to mathematically rate the water quality and assign it to the descriptive categories of good, fair and poor. The TSI is a water quality index for lakes and impounded waters using values of chlorophyll a, transparency, nitrogen, and phosphorus to calculate a water quality rating. The TSI for Florida lakes developed by Huber et al.

Table 11. Point source discharges within the upper Ocklawaha River basin. Data from Central Florida District, FDEP, Lake County Environmental Services, and SJRWMD Permitting Program. For River Reach see Figure 17.

Reach	Source	County	Location	Receiving Water	Acreage[1]	Treatment System[2]	Status
19.0	Coca Cola	Lake	Leesburg	Lake Griffin	--	aeration of weak waste, sprayfield disposal of strong waste	valid IW[3] permit
19.0	Coca Cola	Lake	Leesburg	Lake Harris	--	aeration of weak waste, sprayfield disposal of strong waste	valid IW[3] permit
24.0	Florida Food Products	Lake	Eustis	Lake Yale	--	aeration of weak waste, sprayfield disposal of strong waste	valid IW[3] permit
24.0	Golden Gem	Lake	Eustis	Lake Yale	--	aeration of weak waste sprayfield disposal of strong waste	temporary operating permit
28.0	Springhill Farms	Lake	Eustis	Hick's Ditch	228	partial back-pumping to adjacent fernery freeze protection pond	valid permit #4-069-0281
31.0	Silver Springs Citrus	Lake	Howey-in-the Hills	Little Lake Harris	--	aeration of weak waste, sprayfield disposal of strong waste	valid IW[3] permit
31.1	JA-MAR	Lake	Leesburg	Lake Denham	400	will construct a 26.4 acre wetland treatment reservoir	valid MSSW permit #4-069-0294
32.0	J & L Farms	Lake	Astatula	Apopka-Beauclair Canal	420	10 acre pond, upland upland spray disposal	valid permit #44-069-0001

1 Acreage represents land in production.
2 Treatment systems are generally ponds designed to reduce off-site discharges.
3 IW - Industrial Waste

Figure 17. River reach locations in the UORB.

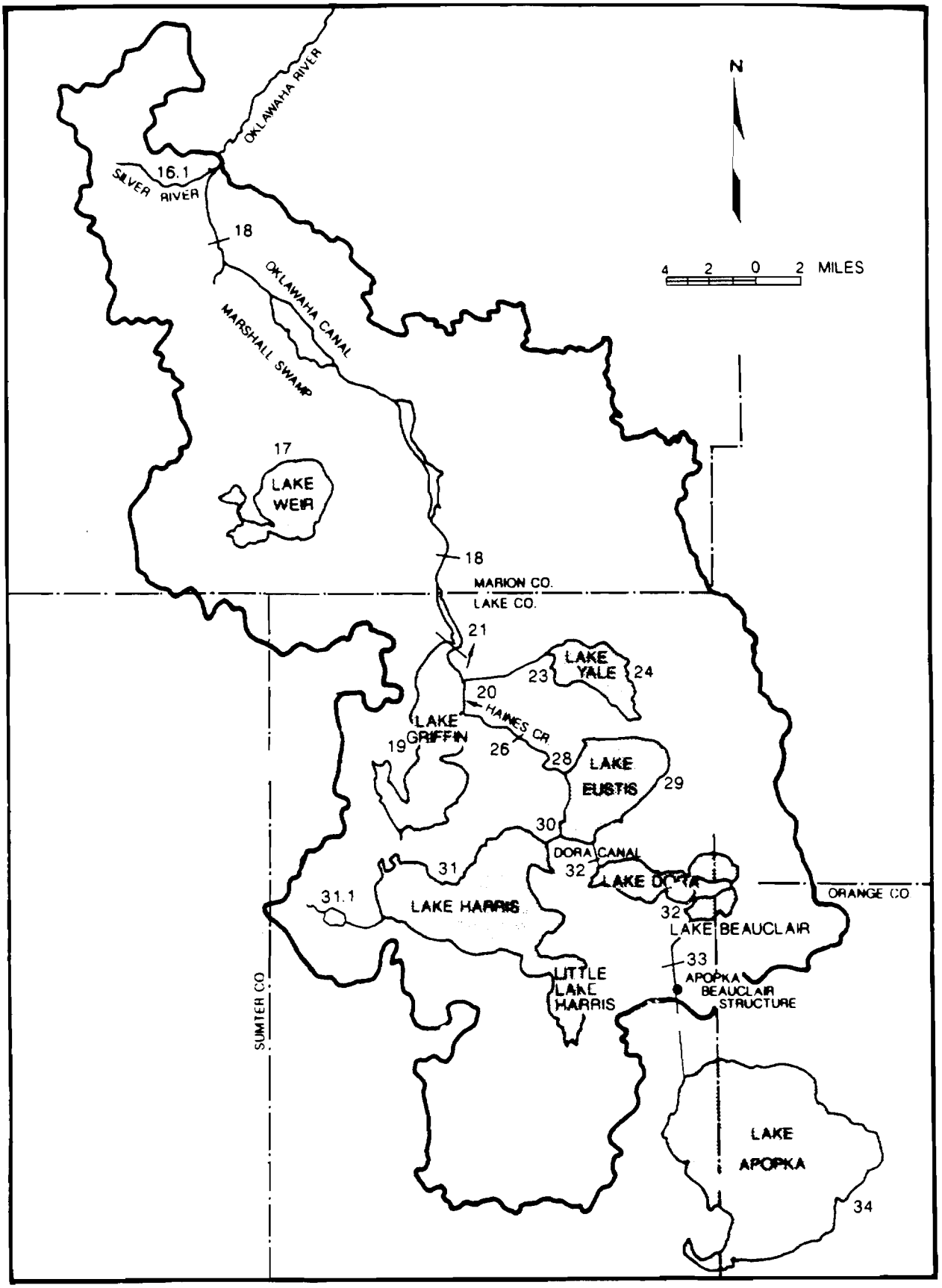


Table 12. Pollution sources violating or potentially exceeding standards, within the Upper Ocklawaha River Basin. Data from the Central Florida District Office, Florida Department of Environmental Protection. For location of River Reach, see Figure 17.

Reach	Name	County	Location	Receiving Body	Problems
31.0	Astatula Landfill	Lake	Astatula	Little Lake Harris	Documented ground water pollution.
31.0	Leesburg Landfill	Lake	Leesburg	Lake Harris	No documented ground water or surface water pollution.

Table 13. Pollution sources operating with a temporary permit. Data from the Central Florida District Office, FDEP, Lake County Environmental Services, and SJRWMD Permitting Program. For locations of River Reach, see Figure 17.

Reach	Name	County	Location	Receiving Water
24.0	Golden Gem	Lake	Eustis	Lake Yale

(1982) was used for the assessment of water quality at lake stations. A TSI rating of 0-59 is considered good; 60-69 is rated fair; and 70-100 is considered poor.

The WQI is a similar index but is more suited to the evaluation of streams and rivers. It is calculated using general categories of water clarity, dissolved oxygen, oxygen demand, nutrients, bacteria, and biological diversity. Our calculations are based on turbidity, total suspended solids, dissolved oxygen, biological oxygen demand, total nitrogen, and total phosphorus, using the index developed by FDEP (Hand et al. 1988). A WQI rating of 0-44 is considered good; 45-59 is considered fair; and 60-100 is considered poor.

We calculated mean and 95% confidence limits for TSI and WQI for stations in the UORB. In Tables 14-15, a station is given a split descriptive rating (e.g. Poor-Fair) if the 95% confidence interval for the index overlaps more than one of the rating categories. In such cases, the first word in the split rating (Poor, in the example above) represents the descriptive rating for the average index value.

For stations that were sampled at least 10 times both before and after 1990, water quality indices were determined for both time periods. Although not a formal trend analysis, this can give some indication whether substantial changes in water quality have occurred in recent years.

Lake Stations

In general, those lakes with relatively poor water quality are influenced by flow from hypereutrophic Lake Apopka (Table 14 and Figure 18). Although the discharge from Lake Apopka acts clearly as a point source of pollution for the downstream lakes, the significance of other point and nonpoint pollution sources in the basin is unclear. The water quality of Lake Beauclair and Lake Dora is rated poor. The water quality of Lake Eustis improves slightly to a fair-poor rating. Lake Griffin is generally rated poor; this deterioration from upstream waters is perhaps due to discharges from muck farms in the drainage basin or runoff from the city of Leesburg.

Those lakes with with relatively good water quality are not influenced by flow from Lake Apopka. Lake Harris with fair to poor water quality, and Little Lake Harris, with fair to good water quality, are influenced by high quality water flow from the Palatlakaha River and runoff from surrounding wetland areas. Lake Yale and Lake Weir, which have no major tributaries, exhibit good water quality.

TSI values determined from data reported by agencies other than LCES show little change in pre- and post-1990 samples. However, recent data reported by LCES show generally poorer water quality than in pre-1990 samples, particularly for Lake

Table 14. Water quality ratings (Trophic State Index, TSI) for selected lake stations in the UORB. Agency Codes: SJR - St. Johns River Water Mgmt Dist; DEP - FL Dept of Environmental Protection; GFC - FL Game and Fresh Water Fish Comm; LCES - Lake County Environmental Services.

Station/ Agency	Period of Record	Number of Samples	Mean TSI	TSI Rating	Period of Record	Number of Samples	Mean TSI	TSI Rating
Lake Beauclair								
DEP	3/80-1/90	13	90.0	Poor				
LCES	3/79-11/89	40	83.5	Poor	2/90-1/94	14	87.7	Poor
Lake Dora								
DEP, W	2/80-1/90	13	82.0	Poor				
LCES, W	9/80-11/89	41	75.4	Poor	2/90-1/94	14	80.3	Poor
SJR, C	10/85-8/89	23	77.4	Poor	6/90-1/94	22	81.2	Poor
Lake Eustis								
DEP, C	1/80-1/90	27	66.3	Fair				
LCES, N	6/79-11/89	41	65.1	Fair	2/90-1/94	14	66.4	Fair-Poor
SJR, C					6/90-1/94	23	67.6	Fair-Poor
Lake Griffin, Center								
GFC	11/82-11/89	49	80.4	Poor	1/90-12/93	16	78.6	Poor
LCES	3/80-11/89	37	71.9	Poor-Fair	2/90-1/94	14	75.6	Poor
SJR	10/85-1/94	24	75.3	Poor				
Lake Harris								
DEP, C	3/80-9/89	11	63.7	Fair				
LCES, N	6/79-11/89	44	54.9	Good	2/90-1/94	14	65.1	Fair-Poor-Good
SJR, C					6/90-1/94	21	66.8	Fair-Poor
Little Lake Harris, North								
DEP	3/80-1/90	13	61.6	Fair-Good				
LCES	6/79-11/89	40	53.3	Good	2/90-1/94	14	62.3	Fair-Good
Lake Yale								
LCES, N	3/79-11/89	28	38.9	Good	2/90-1/94	16	34.2	Good
SJR, C	10/85-12/89	25	37.6	Good	6/90-11/93	22	35.7	Good
Lake Weir, Center								
SJR	3/84-12/89	33	35.7	Good	2/90-2/94	22	39.3	Good

Figure 18. Schematic representation of water quality in the Upper Ocklawaha River Basin.

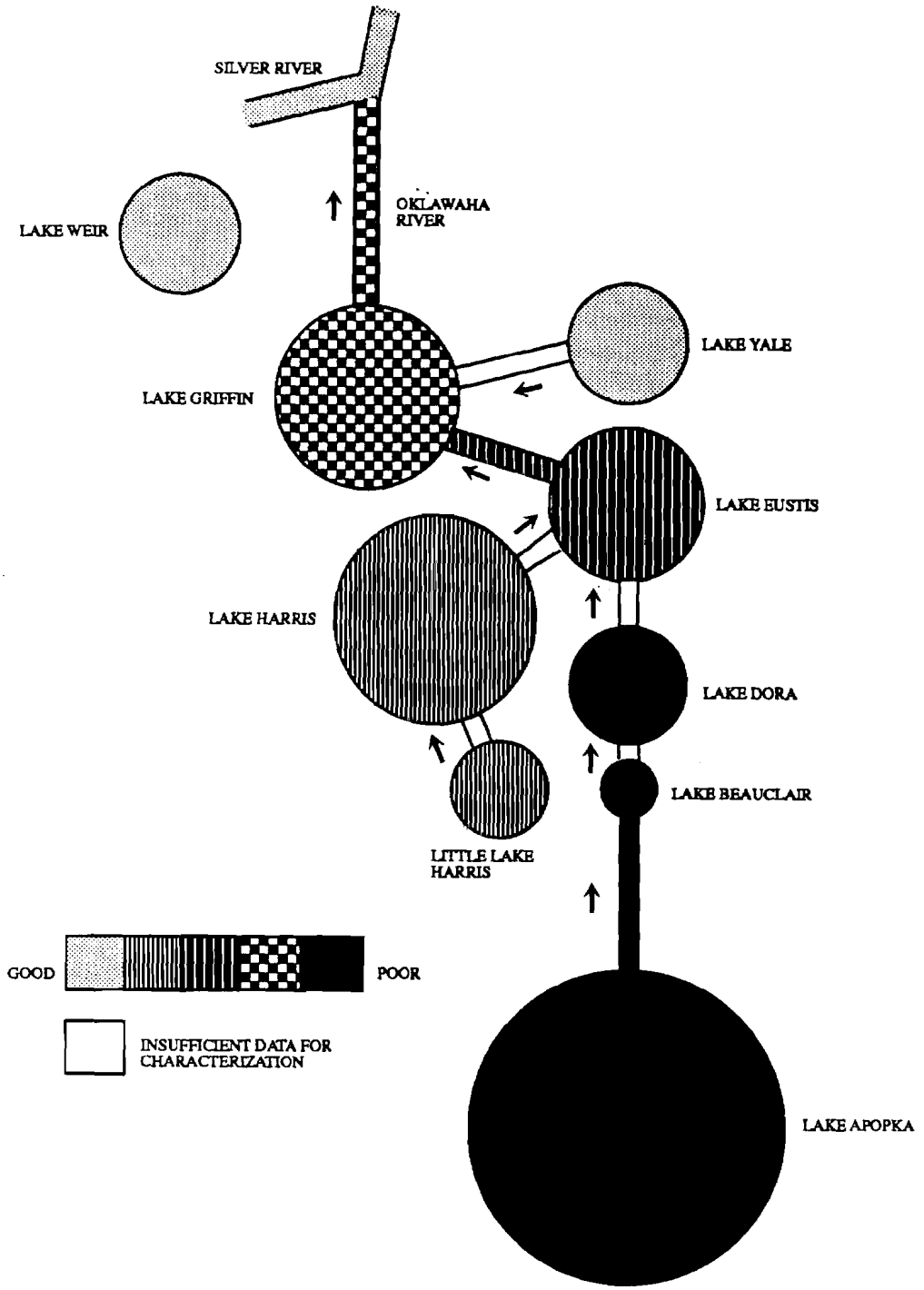


Table 15. Water quality ratings for selected stream and canal stations (Water Quality Index, WQI) of the UORB. Agency Codes: SJR - St. Johns River Water Management District; DEP - Florida Department of Environmental Protection; LCES - Lake County Environmental Services; USGS - United States Geological Survey.

Station/ Agency	Period of Record	Number of Samples	Mean WQI	WQI Rating	Period of Record	Number of Samples	Mean WQI	WQI Rating
Apopka-Beauclair Canal								
USGS	4/81-9/90	70	63.6	Poor-Fair				
LCES	4/82-11/89	33	63.0	Poor-Fair	2/90-1/94	15	66.4	Poor
SJR	10/85-11/89	44	70.4	Poor	2/90-1/94	92	67.8	Poor
Haines Creek								
LCES	6/79-12/89	61	49.3	Fair	1/90-1/94	17	51.4	Fair
Ocklawaha River at Moss Bluff								
DEP	1/80-2/94	63	58.1	Fair-Poor				
SJR	6/81-12/89	38	58.7	Fair-Poor	2/90-1/94	24	57.9	Fair-Poor
Ocklawaha River at Sharpes Ferry								
DEP	10/83-11/89	45	55.4	Fair	1/90-2/94	18	57.0	Fair-Poor
SJR	6/81-9/84	12	55.7	Fair-Poor				
Ocklawaha River upstream of Silver River								
DEP	1/85-8/88	14	59.8	Fair-Poor				
SJR	6/81-9/84	12	59.7	Fair-Poor				
Silver River								
DEP	3/80-2/94	37	25.3	Good				
SJR	11/81-1/94	12	29.8	Good				
Ocklawaha River near SR 40 (downstream of Silver River)								
DEP	8/84-3/92	16	29.9	Good				
SJR	6/81-1/94	13	42.2	Good-Fair				
Ocklawaha R. near Conner								
USGS	11/82-1/90	38	33.8	Good				

Harris and Little Lake Harris. The most recent data for Lake Harris indicate water quality nearly as poor as in Lake Eustis. TSI values determined from pre-1990 LCES data were in several cases considerably lower than those determined for the same lakes by other agencies, suggesting that the temporal changes in LCES data were more likely due to changes in analysis procedures rather than to deterioration in water quality.

Stream and Canal Stations

The water quality of tributaries within the basin closely resembles that of the nearest upstream water body (Table 15 and Figure 18). The Apopka-Beauclair Canal is rated poor. Haines Creek, downstream from Lake Eustis, is rated fair. Water quality of the Ocklawaha River upstream of the confluence with the Silver River is fair-poor. Northward flow of poor quality water from Lake Griffin plus agricultural discharges north of SR 42 affect the Ocklawaha River by depressing water quality until it reaches the Silver River. The Ocklawaha River north of Lake Griffin to SR 40 is essentially a canal with little internal water quality improvement capability. If it were not for the moderating effects of high quality discharge from the Silver River, the water quality of the Ocklawaha River at SR 40 would probably be very similar to that of poorly rated Lake Griffin.

TOXIC POLLUTANTS

The 1991 UORB SWIM plan raised concerns about exceedances of the Chapter 17-3 water quality criteria for Class III waters for trace metals. The water quality standards were changed in 1993. The new standards for several metals are dependent on total hardness. The available data are often difficult to assess by the current standards because frequently hardness was not measured or the detection limits were higher than the State Class III water quality standards. In reviewing metals data from District water quality sampling in the basin, samples were grouped in three categories: exceedances of standards; probable exceedances of standards (total hardness was not measured on that date but the reported metal concentration exceeded the standard for the average hardness reported for that station); and possible exceedances of standards (metals were not detected but the detection limit was above the Class III standard). This analysis showed no consistent pattern of exceedance of state water quality standards in the UORB (Table 16). Exceedances or probable exceedances of standards were most frequent for lead and silver. However, detection limits for these metals were often greater than the water quality standards, and when detectable amounts were reported the concentrations were usually close to the detection limits. In addition, occasional exceedances or probable exceedances of State Class III standards for cadmium, copper, and zinc were recorded at several stations in the UORB. While these possible violations of water quality standards represent a potential cause for concern, the environmental significance is unclear because

Table 16. Potential exceedances of Florida water quality standards for trace metals in surface water samples for the UORB. See text for definition of probable and possible exceedances. Data from St. Johns River Water Management District.

Parameter/ Station	Period of record	Number of samples	Number of exceedances	Number of probable exceedances	Number of possible exceedances
Cadmium					
Apopka-Beauclair Canal	860603-910313	27	0	0	1
Lake Weir, Center	860604-940208	25	0	2	5
Lake Yale, Center	860603-931130	27	0	1	0
Copper					
Ocklawaha River @ Moss Bluff	890808-940225	14	0	1	0
Lake Weir, Center	860604-940208	25	0	2	0
Lake Griffin, Center	860604-940106	17	0	1	0
Lead					
Apopka-Beauclair Canal	860603-920217	95	2	2	2
Ocklawaha River @ Moss Bluff	890808-940225	14	0	0	1
Lake Weir, Center	860604-940208	23	0	3	16
Lake Dora, Center	860603-900815	14	0	4	0
Lake Yale, Center	860603-931130	24	0	3	6
Lake Griffin, Center	860604-940106	14	0	4	5
Lake Eustis, Center	900815-940106	10	0	2	0
Silver					
Apopka-Beauclair Canal	860805-890524	25	7	0	18
Ocklawaha River @ Moss Bluff	931130-940225	3	0	0	2
Lake Weir, Center	860806-931130	7	2	0	4
Lake Dora, Center	860805-940106	10	5	0	4
Lake Yale, Center	860805-931130	7	2	0	4
Lake Griffin, Center	860806-940106	8	3	0	5
Lake Eustis, Center	931130-940106	2	1	0	0
Lake Harris, Center	931130-940106	2	1	0	0
Zinc					
Apopka-Beauclair Canal	870119-910313	28	1	3	0
Lake Weir, Center	870408-940208	24	1	3	2
Lake Yale, Center	870204-931130	25	0	1	0
Lake Griffin, Center	870204-940106	16	0	1	0
Mercury					
Apopka-Beauclair Canal	870323-871216	3	0	0	3
Lake Weir, Center	870408	1	0	0	1
Lake Yale, Center	870408	1	0	0	1
Lake Dora, Center	870408	1	0	0	1
Lake Griffin, Center	870408	1	0	0	1

of limited sampling and equivocal interpretation of near detection limit data. Sources for heavy metal pollution in the basin have not been identified.

Mercury contamination has recently been a concern in several areas of Florida. The District has conducted limited analyses for mercury in UORB waters (Table 16). Mercury concentrations reported in all data reviewed were below detection limits. However, the extent of contamination cannot be adequately characterized because the detection limits for mercury in District laboratory analyses were above the State Class III standards.

Two important sites of accumulation of many toxic pollutants in aquatic systems are the bottom sediments and the aquatic biota. Many of the toxic chemicals identified as EPA Priority Pollutants are readily sorbed onto sediment particles, and hence concentrate in the benthos. Through the processes of physical resuspension and chemical reduction, constituents in the sediments can be released to overlying waters. Hence, pollutant concentrations in bottom sediments and the biota may provide a better indication of contamination than concentrations in the water column. Interpretation of data from a screening survey of pollutant concentrations in bottom sediments and fish tissues is currently in progress. Plans are being developed for contaminant testing of fish stocks developing in reflooded muck farms in the basin (see project description for the Emeralda Marsh Conservation Area restoration).

FDEP, FGFWFC, and the Florida Department of Health and Rehabilitative Services have been conducting statewide surveys of mercury levels in fish tissues. Several stations have been sampled in the Ocklawaha River basin (Lake Apopka, Lake Griffin, Lake Weir, Silver Springs, and the Ocklawaha River at Sharpes Ferry). Mercury tissue concentrations have not exceeded the 1.0 part per million (ppm) federal safety level at any stations in the basin. However, tissue levels have exceeded 0.5 ppm (the level at which Florida begins issuing health advisories) at Lake Weir, Silver Springs, and the Ocklawaha River at Sharpes Ferry.

4. GOVERNMENTAL JURISDICTION
(of the water body and within one mile of the banks)

A listing of all Federal, State, regional and local units of government having jurisdiction within the UORB is included below. A complete directory of addresses is found in Appendix A.

FEDERAL GOVERNMENT

U.S. Environmental Protection Agency

EPA issues National Pollution Discharge Elimination System (NPDES) permits and Air quality permits. EPA also issues permits, and reviews permits issued by the Florida Department of Environmental Protection (FDEP) for the treatment, disposal and storage of hazardous wastes. EPA also reviews U.S. Corps of Engineers (USCOE) permit activities, sets minimum water quality standards, and sets guidelines for state environmental programs.

U.S. Department of Transportation

The Department of Transportation promotes multi-modal transportation systems. It also encourages formation of multi-jurisdictional Metropolitan Planning Organizations (MPO's).

U.S. Department of Agriculture

- Forest Service promotes watershed management, wildlife habitat management, and reforestation programs.
- Soil Conservation Service promotes the use of conservation practices to reduce runoff and soil losses, and thus improve water quality in waterways.
- Agriculture Stabilization and Conservation Service helps protect wetlands and solve water, woodland, and pollution problems on farms and ranches.

U.S. Department of Interior

- Fish and Wildlife Service is responsible for the protection and improvement of fish and wildlife habitat. USFWS also reviews USCOE permits for effects on fish and wildlife.
- Geological Survey monitors lake levels, river and stream flow, lake water quality, and water use.

U.S. Department of the Army

- Corps of Engineers is responsible for construction and maintenance of navigational channels in inland waters. USCOE and FDEP regulate dredge and fill permits in Florida waters, using a joint application, but separate authorities and programs.

U.S. Department of Commerce

- National Weather Service
- Bureau of Census

FLORIDA STATE GOVERNMENT

Department of Transportation

FDOT directs and coordinates construction activities regarding roadway and bridge design and related environmental studies.

Department of Environmental Protection

FDEP is the lead state agency involved in water quality, pollution control, and resource recovery programs. The department has permit jurisdiction over point and nonpoint source discharges, some MSSW, some dredge and fill, hazardous and solid wastes, drinking water systems, power plant siting, mines, activities forward of the Coastal Construction Control Line, and many construction activities in waters of the state. The Stormwater Management Section is responsible for waterbody restoration programs in Florida in conjunction with EPA. The department also interacts closely with other state and federal agencies on water related matters.

Since the department consolidated with the Department of Natural Resources, FDEP assumed the responsibilities of that agency, including: administration of all state lands, including parks and aquatic preserves; acts as the enforcement agency for the

Florida Endangered Species Act and the Oil Spill Prevention and Pollution Control Act; coordination of aquatic plant research and control in the state; issues permits for transport of aquatic plants, herbicide spraying, and other plant control methods in aquatic environments.

Game and Fresh Water Fish Commission

FGFWFC has regulatory authority and executive powers over game and nongame species of freshwater fish and wildlife. Its mission is to manage freshwater aquatic life and wild animal life and their habitats to perpetuate a diversity of species with densities and distributions that provide sustained ecological, recreational, scientific, educational, aesthetic, and economic benefits. The commission has a formal commenting role in the regulatory process relating to endangered species protection in wetland areas.

University of Florida- Institute of Food & Agricultural Sciences

IFAS serves as a statewide organization dedicated to public education and research on agricultural issues, provides an educational partnership through local governments and the agricultural industry, and maintains an information resource base of consumer oriented materials.

Department of Community Affairs

FDCA, Bureau of Land and Water Management oversees local review of developments with regional impact and also promotes floodplain management through the National Flood Insurance Program. The department is responsible for review of local government comprehensive plans, and for providing technical assistance to local government and Regional Planning Councils.

Department of Agriculture and Consumer Services

This department regulates the purchase and use of restricted pesticides. The Bureau of Soil and Water Conservation provides support for 62 Soil and Water Conservation Districts within the state. These districts are primarily concerned with soil drainage and erosion control.

Department of Health and Rehabilitative Services

FHRS responsibilities include permitting for public health functions of water supplies (primarily small to medium supplies), onsite sewage disposal, septic tank cleaning and waste disposal (in conjunction with FDEP), and solid waste control

(secondary role). FHRS has district public health departments in each of the counties in the UORB.

REGIONAL GOVERNMENT

Water Management Districts

The water management districts have responsibility for managing the quantity and quality of waters within their boundaries. The districts issue consumptive use permits to users wanting to withdraw and use surface or groundwater for any purpose other than individual household use. Included in the districts' responsibilities are the conservation of surface and groundwater, the regulation of dams and impoundments, the prevention of floods, soil erosion and excessive drainage, the conservation of water-related resources including wetlands, and issuance of MSSW, stormwater, agricultural surface water management system, and certain Wetland Resource Management (dredge and fill) permits.

- St. Johns River Water Management District
  The UORB is located almost entirely within the jurisdictional boundary of the SJRWMD. The District's services, programs, and activities related to the basin are described throughout the text of this plan.
- Southwest Florida Water Management District
  The only areas of the UORB that fall within the jurisdiction of the SWFWMD are the small areas within Sumter County (see Figure 8). There are no major water bodies or tributaries within these areas.

Regional Planning Councils

The Regional Planning Councils are responsible for assisting local governments in developing comprehensive land use plans which will guide and control future development.

- Withlacoochee Regional Planning Council
  (Marion & Sumter Counties)
- East Central Florida Regional Planning Council
  (Lake & Orange Counties)

Basin Board

- Ocklawaha Chain-of-Lakes Restoration Committee

- Ocklawaha River Basin Advisory Council

Soil and Water Conservation Districts

- Lake County Soil and Water Conservation District
- Marion County Soil and Water Conservation District
- Orange County Soil and Water Conservation District
- Sumter County Soil and Water Conservation District

Water Authority

- Lake County Water Authority
- Zellwood Drainage and Water Control District

LOCAL GOVERNMENT

- Marion County and the Municipalities of:
  Town of Belleview
  City of Ocala

- Lake County and the Municipalities of:
  Town of Astatula
  City of Eustis
  Town of Fruitland Park
  Town of Howey-in-the-Hills
  Town of Lady Lake
  City of Leesburg
  City of Mount Dora
  City of Tavares
  City of Umatilla

- Orange County

- Sumter County

REGULATORY PROGRAM

An integral component of the upper Ocklawaha River basin SWIM Program is the control of point and non-point sources of pollution impacting the lakes and river stretch in the system. The District has identified eight point sources in the basin, of which three

are agricultural operations, and five are food processing plants. Sewage treatment plants in the basin are land application systems with no surface discharge.

In August 1991, the St. Johns River Water Management District began regulating agricultural discharges under Chapter 40C-44, F.A.C. (Agriculture Surface Water Management System rule). These drainage waters typically contain high levels of nutrients and other contaminants. A major focus of the regulatory effort involves the construction of retention pond/recycling systems such that the volume of water discharged off-site is decreased by 60-70%. In cases where the permitted discharges still cause downstream pollution problems, the District requires additional treatment before the water is discharged.

All farms in the basin currently have valid agricultural surface water management system permits. Since 1988, the District has purchased 10 of the 13 muck farms in the basin and eliminated the associated discharges. More stringent action, which may include further reduction in discharge by recycling and additional water quality practices, depends on the establishment of nutrient budgets for the basin.

Because the restoration effort represents such a large investment of time and resources, important consideration must be given to protecting the quality of the water body once restoration is accomplished. Besides the adoption of special basin criteria which focus mainly on the watershed surrounding the water body, a number of alternatives exist which would protect the quality of the water body:

1. Water body specific nutrient limits can be established based on detailed information concerning the assimilative capacity of the water body collected through the development of nutrient budgets. This is the most rigorous approach to implementing existing narrative nutrient standards and provides a high degree of technical support on which to base regulations.
2. Alternatively, water body specific nutrient limits may be adopted through a policy directive based on the best available existing information. This could occur more quickly, but would not be as technically supportable as number 1 above.
3. The water body could be designated an Outstanding Florida Water, which limits degradation based on ambient or existing conditions.

FDEP uses all three of these alternatives in protecting water quality of special waters. Recent revisions to Chapter 62-40, F.A.C., the state water policy, require that the water management districts develop basin specific goals in each SWIM basin for reduction of pollutant loadings. Interim Pollutant load reduction goals (PLRGs) and schedules for development of final PLRGs were required to be included in updated SWIM Plans by the end of 1994. Interim PLRGs and schedules for development of final

PLRGs for the UORB are presented Chapter 5 and in the description for Project OK-1-113-M (Nutrient loading limits adoption).

If the water quality standards are changed, then violations of the standards would be subject to the same enforcement options which are currently available. As part of the permitting process, revised nutrient standards would be incorporated into the review and renewal of fixed length permits. Under Chapter 40C-44, F.A.C., permits for agricultural discharges may be revoked and modified to comply with revised state water quality standards or pollutant load reduction goals adopted by the District.

The FDEP regulates the discharges from food processing plants. It is essential that there be a coordinated regulatory effort between federal, state, regional, and local regulatory agencies and other groups, such as the Ocklawaha Chain-of-Lakes Restoration Committee, to monitor and upgrade these facilities as required for restoration of the river basin. It is important that the regulation of point sources utilize updated technology, including state-of-the-art modeling procedures. The process should be closely coordinated with the District's hydrodynamic modeling of the basin. Wasteload allocations for the five food processing plants may require re-evaluation.

Nonpoint sources are usually associated with land uses that do not create a discrete surface discharge. Sources of nonpoint pollution include urban and agricultural stormwater runoff, leachate from failed septic systems, contaminants associated with marinas, and leachate from landfills. Each of these nonpoint sources requires a different approach to reduce detrimental effects. The relative importance of nonpoint sources of pollution to the basin should be assessed so that problem areas can be identified and management options implemented. Each of these sources are currently regulated by at least one agency, consequently, improved coordination of the regulatory effort is important.

The coordination among state, regional, and local governing bodies that is necessary to regulate point and nonpoint source discharges will be attained in part through the comprehensive plan development process, and in part through the Interagency Coordination Program described later in this plan.

A substantial information base exists for point and nonpoint sources in the upper Ocklawaha River basin. However, certain additional data are required to complete an assessment before some further actions can be taken. This does not preclude continued regulatory efforts toward controlling discharges from agricultural point sources, MSSW and stormwater permits and compliance. The development of nutrient budgets for the system is clearly very important in prioritizing future additional regulatory efforts.

5. CURRENT STATUS OF ACTIVE RESTORATION OR CONSERVATION PROJECTS WITHIN THE UORB

DISTRICT LAND ACQUISITION ACTIVITIES

Within Marion County, the District has acquired Sunnyhill Farm and Ocklawaha Farms (Figure 16), which include a total of approximately 8,500 acres. In Lake County, several muck farms and adjacent parcels have been acquired within the Emeralda Marsh Conservation Area, comprising about 7,000 acres. Other properties acquired include the S.N. Knight-Leesburg Farm bordering Lake Harris, and Pine Meadows Farm, in the Lake Eustis drainage basin (Figure 16). A major focus of the UORB SWIM program is restoration of the historic river channel and floodplain wetlands in these areas.

Acquisition of property located between Sunnyhill Farm and Moss Bluff is necessary for restoration of the historic river channel in that area. Several small outparcels in that area have been acquired and negotiations are in progress for the remaining outparcels. Other properties in the UORB presently being considered for acquisition for restoration or protection include Emeralda Island Marsh, Okahumpka Marsh, Double Run Swamp, and portions of Marshall Swamp (see Figure 16). The Ocklawaha Farms and Marshall Swamp properties are part of an area being jointly sponsored by the District and the Nature Conservancy for acquisition through the CARL program. The District obtained an inventory of farmlands in the UORB for potential acquisition from Modica and Associates, Environmental Planning, Design, and Permitting. Also, contacts are being developed with Marion, Lake, and Orange Counties for potential joint acquisitions or other assistance with land acquisition by local governments.

Due to the deauthorization of the Cross-Florida Barge Canal, additional lands within the area of Marshall Swamp and along the Ocklawaha River in Canal Authority ownership have been transferred to the State of Florida. A management plan for these lands is under development. The overall plan for all Canal Authority lands is to develop a continuous greenway corridor from the St. Johns River to the Gulf of Mexico.

PROGRESS IN THE UORB SWIM PROGRAM

The District has identified five priority issues to be addressed by the UORB SWIM program: (1) excessive levels of nutrients in the UORB system; (2) potentially hazardous levels of metals and organic pollutants in the UORB system; (3) loss of wetland, shoreline, and other fish and wildlife habitats; (4) interagency coordination in management; and (5) public awareness and education. In the five years since initial approval of the UORB SWIM Plan, the District has implemented projects to address each of these issues.

The following information is a brief overview of the progress in the UORB SWIM Program. Specific projects referred to are identified by project title, as abbreviated in the Table of Contents. More detailed information is found in the descriptions of specific projects (Chapter 9) and in summaries of completed reports (Appendix F).

Diagnostic and feasibility projects were designed to evaluate the status of the water bodies, further our understanding of the causes for existing problems, and test potential restoration techniques. Several diagnostic studies have been completed or are in progress. Land uses in the basin were mapped and entered into a GIS mapping system from aerial photos taken in 1987-89 (Land Use Mapping of the UORB). More detailed mapping of existing wetlands was completed using 1986 aerial photos (Wetland Mapping of the UORB). Bathymetry and sediment depths for the seven major lakes in the basin were mapped and entered into GIS files (Bathymetric & Sediment Mapping of Major Lakes; Danek et al. 1991 - see report summary in Appendix F). Results of these studies are being used in the development of nutrient budgets for the basin and in development of alternative regulation schedules for the Ocklawaha Chain-of-Lakes.

An environmental assessment of Lake Weir was completed, including an assessment of the historical development of the watershed and associated nutrient loading to the lake, limnological surveys of the lake, reconstruction of historical trends in water quality from analysis of sediment cores, and development of management recommendations for restoration and maintenance of water quality (Lake Weir Eutrophication Study). Report conclusions include that stormwater runoff and septic tank effluents from increasing populations in the watershed are significant contributors to eutrophication in Lake Weir. Also, agricultural runoff remains a major nutrient source for the lake (Crisman et al. 1992 - see report summary in Appendix F). Results of this study will help to provide a focus for establishing PLRGs for the lake.

Major diagnostic projects still in progress include development of external and internal nutrient budgets and trophic state models for the lakes in the basin. A Phase I external nutrient budget has been completed, developed primarily from existing land use, hydrologic, and water quality information (External Nutrient Budget and Trophic State Modeling). Upstream tributaries were major nutrient sources for Lakes Beauclair, Dora,

Eustis, and Griffin. Discharges from muck farms were the major source of phosphorus for Lake Griffin. Nutrient loadings to Lakes Harris-Little Harris, Yale, and Weir were divided among a number of sources, with no single one dominant (Fulton in prep.). As part of the nutrient budget study, lake trophic state models were used to predict effects of alternative restoration and management actions on phosphorus loading and water quality. Targeted studies are being developed to fill major information needs and refine the external nutrient budgets. The external nutrient budget study has been the primary resource used in developing interim pollutant load reduction goals for the basin. Further refinement of the nutrient budgets will be necessary to develop final PLRGs for the basin.

The bottom sediments of eutrophic lakes contain large stores of nutrients. Although the bottom sediments are a primary sink for nutrients entering lakes, releases of nutrients from bottom sediments have been known to prevent recovery of water quality in lakes for long periods after external nutrient loading has been reduced. Measurements of sediment nutrient stores and rates of sedimentation of nutrients are necessary to predict effects of restoration and regulatory measures on water quality. Studies of internal nutrient recycling processes have been initiated with a study of sediment and nutrient deposition in Lakes Griffin, Eustis, and Dora (Internal Nutrient Budget Study). Objectives of these studies include estimation of modern basin-wide storage of sedimentary nutrients, measurement of rates of sediment and nutrient accumulation, and reconstruction of historic trophic state from sedimentation rates and paleolimnological analyses of sedimentary diatoms. The results of these studies will be used to refine estimates of current and historic nutrient sources and utilization necessary for PLRG development.

Another diagnostic study in progress is a screening survey of metals and organic pollutants in bottom sediments and fish tissues (Investigation of Metals & Organic Pollutants). Samples were collected at seven sites in the UORB and analyses were conducted for trace metals and organic chemicals from the EPA Priority Pollutant List. Samples have been analyzed and data interpretation is proceeding. The results of this study will identify potential problem areas and potential contaminant loading sources.

The major feasibility projects in progess include development of a hydrologic and hydraulic model of the basin (UORB Floodplain Study), and development of methods to evaluate socioeconomic impacts of alternative water management strategies (Socioeconomic Basin Engineering Study; Heaney et al. 1991 - see report summary in Appendix F; Ritter and Herrera in prep.). Results of both of these projects are currently being used in development of new regulation schedules for the Ocklawaha Chain-of-Lakes. Additionally, extensive hydrological modeling is being conducted to evaluate feasibility and develop plans for wetland restoration projects in the basin.

Management and restoration activities are being pursued concurrently with research. In the regulatory program, efforts continue to ensure that all point and nonpoint source dischargers are in compliance with existing environmental regulations. Conservation plans have been developed and are being implemented for muck farms remaining within the basin (Agricultural Waste Treatment Cost Sharing). Major stormwater permits in the basin are being mapped (Mapping of Permitted Stormwater Conveyance Systems).

As noted previously, interim pollutant load reduction goals were required to be included in updated SWIM plans by the end of 1994. Interim PLRGs are defined as best judgement estimates of the levels of pollutant load reduction anticipated to result from planned corrective actions. Interim PLRGs generally are based on preliminary estimates of pollutant loadings, and represent interim programmatic steps taken until more intensive investigations can be completed. They are not necessarily sufficient for achieving and maintaining applicable water quality standards, and are not necessarily indicative of final PLRGs.

Interim PLRGs for reduction in phosphorus loading have been developed for the basin (Nutrient Loading Limits Adoption), based on results of the Phase I external nutrient budget study (Fulton in prep.). Ratios of nitrogen to phosphorus in lake waters in the basin indicate that algal production is potentially limited by phosphorus availability, except in lakes where excessive phosphorus loading has led to potential nitrogen limitation or mixed phosphorus and nitrogen limitation. The nutrient budgets show that the largest nutrient sources for the lakes in the basin are tributary flows for the lakes downstream of Lake Apopka (85% of total estimated phosphorus loading for Lake Beauclair) and discharges from muck farms within the UORB (59% of total estimated phosphorus loading for Lake Griffin) (Fulton in prep.).

The recommended interim PLRG for the UORB is a combination of:

- Limiting muck farm discharges in the basin to the levels expected from wetland areas [based on a literature review, wetland runoff concentrations of 0.163 mg total phosphorus/L and runoff coefficients varying from 0.33 - 0.4 (depending on soil type) were used in calculations], with
- Reduction in Apopka-Beauclair Canal total phosphorus concentrations to the level expected under the Lake Apopka PLRGs (0.05 mg/L).

These actions are predicted to affect primarily the lakes in the basin with the poorest water quality, Lakes Beauclair, Dora, Eustis, and Griffin. Implementation of the interim PLRGs in these lakes are predicted to reduce estimated total phosphorus loadings by 48 - 79%, and reduce estimated in-lake total phosphorus concentrations by 37 - 74% (Table 17).

Table 17. Estimated mean total phosphorus (TP) loadings to the UORB lakes and predicted equilibrium in-lake TP concentrations under existing conditions and under recommended interim Pollutant Load Reduction Goals, 1986-1990 (from Fulton, 1994).

Lake	Current Conditions		Proposed Interim PLRG	
	TP Loading (Kg/yr)	TP Concentration (mg/L)	TP Loading (Kg/yr)	TP Concentration (mg/L)
Beauclair	21,296	0.250	4,434	0.065
Dora	16,288	0.108	6,835	0.047
Harris	20,255	0.025	17,798	0.023
Eustis	23,808	0.052	12,465	0.033
Griffin	38,887	0.102	13,276	0.046
Yale	6,617	0.032	6,617	0.032
Weir	3,259	0.007	3,259	0.007

Programs for reaching the Lake Apopka PLRGs are described the SWIM Plan for Lake Apopka (Conrow et al. 1993). Planned programs for reducing discharges from muck farms within the UORB to attain the interim PLRGs include acquisition and restoration of muck farms in the basin. Reduction of muck farm discharges has already been substantially accomplished by the District's land acquisition program; 10 of the 13 muck farms operating in the basin have been acquired since 1988, and the remaining properties are on the priority list for acquisition. Discharges from the acquired muck farms have declined substantially. At present, estimates of reductions in discharges are available only for Sunnyhill Farm; for this property it is estimated that average annual total phosphorus discharges have decreased by at least 75% compared to discharges when the farm was in operation. Further decreases in discharges are expected as wetland restoration proceeds on these properties, although there is no estimate at present of the time periods required to reach the interim PLRGs. Implementation of these interim PLRGs should also reduce concentrations of trace metals, although no estimates of loadings of metals are available. The nutrient budget study indicates that development of final PLRGs for the basin should address stormwater runoff, primarily from residential and upland agriculture land uses, and other nutrient sources.

Another major management effort is revision of the regulation schedules for the Ocklawaha Chain-of-Lakes to enhance environmental benefits (Lake Fluctuation Schedule Revision). Recommendations for new regulation schedules for the Ocklawaha Chain-of-Lakes to improve environmental benefits were developed through a three step process: (1) Environmental goals were developed for lake fluctuation. (2) A hydrologic model of the basin was used to evaluate the feasibility of the fluctuation goals and develop regulation schedules to meet the goals. (3) An assessment of the economic impacts of the recommended schedules was conducted.

General environmental goals and fluctuation criteria were developed by SJRWMD and the UORB Technical Advisory Group. Goals included enhancement and protection of existing wetlands habitat, enhancement of fisheries, protection of water quality, and restoration of the natural fluctuations in water levels and flows, to the extent feasible given present development in the basin. The assessment of potential economic impacts of the proposed fluctuation schedules examined five general areas, including flood damages, impacts to septic systems, impacts to boat access, impacts to seawalls, and impacts to agriculture. The UORB TAG has reviewed and supported the proposed schedules. A series of public meetings were conducted in November - December 1994 to discuss the proposed schedules. In response to concerns expressed at the public meetings, alternative schedules are presently being developed to reduce economic impacts while still retaining some of the environmental benefits.

The major restoration efforts are wetland restoration projects on the muck farms acquired within the basin. Vegetation surveys have been conducted at Sunnyhill Farm to

monitor wetland vegetation development in relation to environmental conditions (water depth, hydroperiod) in order to develop plans for marsh restoration (Investigation of Marsh Restoration Techniques). These surveys have shown consistent relations between water depth and distributions of rooted emergent and floating wetland plants. Rooted emergents have been largely restricted to average water depths of less than two feet, while floating species occur at average depths greater than zero. This information has been valuable in developing regulation schedules which have provided some control of undesirable floating species (especially water hyacinth, *Eichhornia*). Although distribution patterns of floating and rooted emergent functional groups have been consistent, there has been substantial within- and between-year variability in distribution of individual species. Few clear distinctions have been apparent between distribution patterns of desirable and undesirable (e.g. cattail, *Typha*) emergent plant species.

Interim management of water levels at Sunnyhill Farm has resulted in development of about 1700 acres of wetland habitat in the former agricultural fields (Sunnyhill Wetland Restoration). Water quality has improved somewhat in impounded wetlands that have developed in the former agricultural area, but remains poor. It appears that a restoration of flow through the system will be required to significantly improve water quality. Restoration of the historic Ocklawaha River was initiated in 1992, with clearance of woody vegetation from about six miles of the old river channel.

A conceptual long-term restoration plan for Sunnyhill Farm has been completed. Hydrologic models for the historic riparian wetland system were developed and used to formulate hydrological criteria for the full-scale restoration. Hydrologic models of the existing system and four restoration options were developed for use in designing the full-scale restoration. A cooperative study with U.S. Army Corps of Engineers to determine the feasibility of obtaining Federal funding for the full-scale restoration through Section 1135 of the Water Resources Development Act was completed in January 1995 (see report summary in Appendix F). A decision on Federal funding for the project is pending review of the feasibility study final report.

Restoration planning has been initiated for more recently acquired properties in the Emeralda Marsh and Ocklawaha Prairie restoration areas. All but one of the former muck farms in the Emeralda Marsh Conservation Area have been acquired by the District and a restoration plan has been initiated for the area (Emeralda Marsh Conservation Area Restoration). All of the acquired farms have been flooded to the stage of the adjacent lakes and some were stocked with gamefish by the Florida Game and Fresh Water Fish Commission. In 1993, a Type II Waterfowl Management Area was opened for fall and winter waterfowl hunting in all of the flooded properties. Hiking and horseback riding trails have been established on the uplands and former farm levees. Water quality and vegetation monitoring were initiated on the properties in 1993. This monitoring will document the ecological succession of the flooded former

farms prior to reconnection to waters of the state. In the interim, these areas are providing significant recreational opportunities for the public. Future work will consist of internal reconnections of some of the individual former farms to provide management units with more diverse ecological conditions. Sediments in the flooded farms will be monitored for contaminants.

Pilot operations were begun in October 1994 for Phase I of a proposed created wetland flow-way on the former S.N. Knight South property adjacent to Lake Griffin (Lake Griffin Marsh Flow-way). The objective of the project is to reduce equilibrium nutrient concentrations in Lake Griffin through wetland treatment of ambient water continuously circulated from the lake. Lake Griffin water will be entrained in the flow-way and particulate nutrients and suspended solids will be removed through physical sedimentation during the retention period in the flow-way. Water quality monitoring is being conducted on source water, intake water, flow-way internal water, discharge water, and receiving water. A contractual effort has been initiated that will provide data on the nutrient storage/release potential of soils within the flow-way project. This information will be essential to evaluate the nutrient removal response of the flow-way. Initiation of the pilot test period for the Phase I flow-way will require additional construction to replace and expand existing intake and discharge structures. Permits to conduct the needed construction have been requested. A Phase II flow-way will be developed on the former Lowrie Brown property if the Phase I pilot-test on the S.N. Knight property shows adequate nutrient removal potential. If the Phase II flow-way is not developed, the Lowrie Brown property will be evaluated for reconnection to Lake Griffin.

At Ocklawaha Prairie, as part of a temporary lease agreement, the tenant has performed earthwork that will be needed for restoration of the Ocklawaha River and floodplain wetlands (Ocklawaha Prairie Wetland Restoration). This work includes grading levees along six miles of the old river channel to approximate field elevation, removing woody vegetation and muck accumulations from the old river channel, and plugging or backfilling farm ditches and canals. We have initiated development of a long-term restoration plan for the property. We expect to seek federal funding for the Ocklawaha Prairie restoration through the Section 1135 Program authorized by the Water Resources Development Act.

Interagency Coordination projects are assisting local governments with incorporation of SWIM objectives into the implementation process of local comprehensive plans, including the development of Local Development Regulations derived from Comprehensive Planning Documents (Local Govt Comprehensive Plan Review), and in development of environmental protection ordinances (Local Govt Environmental Protection Ordinance Assist). A natural resource ordinance clearinghouse is maintained to assist local governments in development of environmental ordinances. The District, in

collaboration with Lake County, Orange County, and the University of Florida Center for Governmental Responsibility, has developed two draft model shoreline protection ordinances. The choice of two model ordinances provides flexibility to local governments in adopting a regulatory approach consistent with SWIM objectives.

The Public Information and Participation Program has worked with Lake County Water Authority to print an educational booklet on freshwater wetlands (Coordination of Public School Education Programs). A series of brochures, posters, displays, and presentations have also been developed to educate the public about environmental problems in the UORB and the goals of the SWIM Program, and solicit active public support for, and participation in, SWIM and other resource planning and management efforts (Creation & Distribution of Informational Materials2).

SHORELINE HABITAT PROTECTION ON THE SILVER RIVER.

Heavy boat traffic has threatened the integrity of shoreline habitat in the Silver River. To reduce environmental damage and safety hazards from heavy boat traffic on the Silver River, FDEP proposed to extend a no-wake idle speed zone from the headwaters of the Silver River to the Ocala Boat Basin, near the confluence with the Ocklawaha River. The SJRWMD Governing Board adopted, and the Ocklawaha River Basin Board ratified, a resolution in support of a permanent no-wake zone in the Silver River. The no-wake zone went into effect on 1 May 1988. Enforcement is being implemented by FDEP, with assistance from other state and local agencies.

A REVIEW OF SELECTED LAKE COUNTY WATER-RELATED RESOURCES WITH RECOMMENDATIONS FOR PRESERVATION AND PROTECTION, by the Advisory Committee on Conservation, Ocklawaha Basin Recreation and Water Conservation and Control Authority (Lake County Water Authority), 1985.

This report reviewed a selected group of Lake County environmentally sensitive, water related resources and made recommendations for the preservation and protection of these resources for the benefit of future generations of Lake County citizens. Specific county-wide recommendations include:

- Development and maintenance of a county-wide system of water resource-related parks and recreational facilities - This program was initiated with the purchase and design of the Hickory Point Park on Lake Harris.
- Inventory of Lake County wetlands - An inventory of county wetlands has been completed through a cooperative, cost-sharing program between the Lake County Water Authority and the St. Johns River Water Management District.

- Revision of Lake County's wetlands ordinance - Revision is necessary to insure greater protection of the nature and function of wetlands. A wetlands committee established by the Lake County Department of Environmental Services has prepared a draft wetland ordinance, which is currently out for agency review.
- Lake County development performance criteria - The development criteria guide agriculture, lumbering and mining in wetlands in order to minimize disruption of wetland functions and values. The above-mentioned wetlands committee was established to evaluate these activities as they relate to zoning, impacts to ground water and surface water, and the environment in general.

PLAN FOR THE INTERAGENCY MANAGEMENT OF THE OCKLAWAHA CHAIN-OF-LAKES

The Florida Game and Fresh Water Fish Commission convened an Ocklawaha Chain-of-Lakes Restoration Committee tasked with reviewing the current status of the lakes recreational fisheries, identifying problems impacting the fisheries and recommending solutions. The Committee was composed of members from federal, state, regional, and county government as well as private citizens.

A Technical Advisory Committee was convened to review available information and make recommendations to the Restoration Committee. Following a series of meetings, a plan organized into aquatic plant management, water quality and habitat, fish management, and educational elements was developed by the TAC and recommended to the Committee. The plan identified specific tasks to be undertaken, identified lead and supporting agencies for tasks, listed proposed time lines for task completion, and identified potential current funding sources. The recommended plan was adopted by the Committee and forwarded to the participating agencies for acceptance and implementation. Copies of the plan can be obtained from the Florida Game and Fresh Water Fish Commission.

The Committee will continue to meet on an as-needed basis and will continue to monitor the progress on completion of proposed tasks. The TAC also meets irregularly to review progress in plan implementation. The TAC is a separate advisory group from the UORB Technical Advisory Group (see Project OK-5-623-S, page 171), but membership of the two groups overlap. Current membership of the Restoration Committee TAC includes: Bill Johnson, John Benton, Lawson Snyder (GFC), James Higman, Jeff Schardt, Robbie Lovestrand (DEP), Ken Langeland (UF), Walt Godwin, Gene Caputo (SJRWMD), James Barker, Eric Cotsenmoyer (Lake County), Will Davis (Lake County Water Authority), Tori Kinsey (COE), Gerry Owen, and Larry Shumate.

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Note: SWIM funded studies are in boldface.

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7. PRIORITY ISSUES FOR THE UPPER OCKLAWAHA RIVER BASIN

SWIM ACT INTENT AND FOCUS

SWIM plans are required to demonstrate a cohesive set of strategies and programs to address the following central concerns of the SWIM Act:

1. Point and nonpoint sources of pollution.
2. Destruction/restoration of natural systems which purify surface waters and provide habitats.
3. Correction and prevention of surface water problems.
4. Research to provide a better scientific understanding of the causes and effects of surface water pollution and of the destruction of natural systems in order to better manage and improve surface waters and associated natural systems.
5. Interagency coordination in management.
6. Public awareness and education.

PRIORITY ISSUES FOR THE UORB

The District has identified five priority issues for the UORB SWIM program:

1. Excessive levels of nutrients in the UORB system.
2. Potentially hazardous levels of metals and organic pollutants in the UORB system.
3. Loss of wetland, shoreline, and other fish and wildlife habitats.
4. Interagency coordination in management.
5. Public awareness and education.

The diagnostic and restoration programs developed to address these priority issues focus primarily on the major water bodies in the basin. However, management of unconnected minor lakes and streams (Appendices C and D) will be addressed through the Regulation and Enforcement, Interagency Coordination, and Public Awareness and Education Programs.

The following sections define the priority issues, the goals associated with each issue, the strategies to be employed to achieve these goals, and the specific programs and projects. Projects are only briefly identified in this chapter. Figures 1 through 5 summarize timetables, projected contractual budgets, and inter-relationships among the projects. Chapter 9 describes in more detail each priority project that is scheduled for

fiscal years 1993-1997. Personnel currently involved with the UORB SWIM Program are listed in Table 18.

Each scheduled project is given a unique identification number of the general form: "OK-A-BCD-E", where:

- "OK" distinguishes the upper Ocklawaha River basin SWIM Program from other SWIM Programs in the District.
- "A" ranges from 1 to 6, representing the SWIM Act Intent and Focus concern with which the project is most closely associated, as numbered in this chapter. Many projects address more than one of these concerns, so the detailed project descriptions discuss more completely their relationships with the provisions of the SWIM Act.
- "B" ranges from 1 to 6. Numbers 1 to 5 represent the priority issues identified for the UORB with which the project is most closely identified, as numbered in this section. Again, some projects address more than one of the priority issues, all of which are identified in the detailed project descriptions. Projects in which "B"= 6 are Technical Support projects, that affect all areas of the SWIM Program, such as SWIM plan revision and program administration.
- "C" identifies the program within each priority issue.
- "D" identifies the project within each program. If a detailed project description has not yet been developed, "D"= 0. Usually these are projects that depend on previous projects or are not scheduled to be implemented by fiscal year 1996-97.
- "E" identifies the category of project, and takes the values "D", "F", "M", or "S", where:

    D- Diagnostic/Monitoring studies.
    F- Applied Research/Feasibility studies.
    M- Management/Implementation projects.
    S- Technical Support projects.

PRIORITY ISSUE 1: EXCESSIVE NUTRIENT LEVELS.

Issue definition:

Water quality has markedly deteriorated in many of the UORB lakes, apparently due, in large part, to excessive nutrient loading from point and nonpoint source pollution. Losses of wetland habitat and regulation of water levels may also have contributed to the deterioration of water quality.

Table 18. UORB SWIM Personnel.

Issue	Excessive Nutrient Levels	Metals & organic Pollutants	Habitat Loss	Interagency Coordination	Public Awareness	Technical Support
Project Managers						
Walter Godwin [1]	●	●	●	●	●	●
Rolland Fulton [1]	●	●	●			●
David Walker [1]			●	●	●	●
John Richmond			●			
Hector Herrera			●			
Donthamsetti Rao	●		●			
Larry Fayard	●		●			
Rich Turnbull			●			
Gene Caputo				●		
Victor McDaniel	●	●				
Steve Adams			●			
Other Personnel [2]						
Michael Coveney	●		●			●
Elizabeth Gisondi	●		●			
Joy Marburger			●			
Sayed Jenab			●			
Apurba Borah	●		●			

[1] Contact individuals.
[2] 25% or more of time devoted to UORB SWIM Program.

Goal:

Reduction of nutrient levels to attain water quality necessary to restore and maintain healthy and productive natural systems, and to meet or exceed FDEP Class III water quality standards.

Strategies:

- Enforce existing water quality regulations.
- Develop a thorough understanding of the nature and causes of water quality problems in the UORB.
- Strengthen water quality regulations based on improved understanding of the problems.
- Restore and manage wetlands for improvement of water quality.
- Establish effective and scientifically sound restoration programs to improve water quality.
- Support development of stormwater management programs by local governments.

Programs and Projects

A) Regulation and Enforcement Program.
Project OK-1-111-M (Agricultural waste treatment facility cost sharing program)
Project OK-1-112-M (Promulgate special basin criteria for sensitive environments)
Project OK-1-113-M (Nutrient loading limits adoption)
Project OK-1-114-M (Map permitted stormwater conveyance systems)
Project OK-1-115-M (Control inadequate septic systems in the UORB)
Project OK-1-116-M (Digitization of USGS topographic quadrangle maps)
Project OK-1-117-M (Assistance with stormwater management plan development)
Project OK-5-423-M (Assist local governments in preparation of environmental protection ordinances)

B) Nutrient Sources and Utilization Program.
Project OK-4-121-D (External nutrient budget and trophic state modeling)
Project OK-4-122-D (Internal nutrient budget study)
Project OK-4-123-D (Land-use mapping of the UORB)
Project OK-4-124-D (Bathymetric and sediment mapping of major lakes)
Project OK-4-125-D (Lake Weir eutrophication study)
Project OK-4-126-D (Assessment of phytoplankton productivity, nutrient relationships, and composition)

C) Monitoring Program.
Project OK-4-131-D (Coordination of existing water quality monitoring programs)
Project OK-4-132-D (Biological monitoring of the UORB system)

D) Marsh and Floodplain Restoration Program.
See Priority Issue 3.

E) Restoration of Normal Seasonal Water Level Fluctuations Feasibility Program.
See Priority Issue 3.

F) Restoration Feasibility Program.
Project OK-1-140-F (Evaluate potential restoration strategies)
A variety of potential restoration strategies are currently being evaluated as part of the Lake Apopka SWIM Program. Results from Lake Apopka feasibility studies will be evaluated for applicability to UORB lakes. The Technical Advisory Group for the UORB SWIM Program may develop other restoration and preservation strategies. Specific project numbers will be assigned as feasibility/restoration projects are developed.

PRIORITY ISSUE 2: POTENTIALLY HAZARDOUS LEVELS OF METALS AND ORGANIC POLLUTANTS.

Issue definition:

District monitoring has revealed occasional violations of Class III standards for trace metals at several sites in the UORB. The high amount of agricultural development in the watershed also raises the possibility of pesticide contamination.

Goal:

Reduction of concentrations of toxic metals and pesticides to Class III standards or better.

Strategies:

- Evaluate the nature and causes of the problem.
- Develop and enforce regulatory actions to reduce or eliminate releases of toxic substances into the UORB.
- Establish restoration programs to improve water quality.

Programs and Projects

A) Monitoring Program.
Project OK-4-231-D (Investigation of metals and organic pollutants in sediments and biota)

B) Regulation and Enforcement Program.
Project OK-1-210-M (Coordination between the Water Management District, FDEP, and local pollution control agencies in enforcing pollutant discharge regulations) In addition, work done under Projects OK-1-112-M, OK-1-113-M, OK-1-115-M, and OK-5-423-M may be applicable to toxic pollutant control.

C) Restoration Feasibility Program.
Project OK-1-240-F (Evaluate potential restoration strategies)
The necessity for and nature of restoration projects will depend greatly on results of the monitoring program. Specific project numbers will be assigned as feasibility/restoration projects are developed. Some of the restoration strategies being considered in Project OK-1-140-F may also be applicable to pollutant removal.

PRIORITY ISSUE 3: LOSS OF WETLAND, SHORELINE, AND OTHER FISH AND WILDLIFE HABITAT.

Issue definition:

Agricultural and urban development, stream channelization, and stabilization of water levels have resulted in substantial losses of wetland and other habitats in the UORB.

Goal:

Preservation, restoration, and management of wetland and upland habitats for: 1) Biological activities, 2) Pollution abatement, and 3) Aesthetic purposes.

Strategies:

- Purchase available agricultural lands through land acquisition program.
- Restore/recreate wetland habitat and historical floodplain on acquired properties.
- Preserve/manage existing habitats.
- Promote enforcement of laws protecting habitats and permit stipulations mandated by local, state, and federal agencies.

- Develop more environmentally desirable regulation schedules for the Ocklawaha Chain-of-Lakes.

Programs and Projects

A) Marsh and Floodplain Restoration Program.
Project OK-4-321-D (Investigation of marsh restoration techniques)
Project OK-2-322-M (Sunnyhill wetland restoration)
Project OK-2-323-M (Lake Griffin marsh flow-way)
Project OK-2-324-M (Emeralda Marsh Conservation Area restoration)
Project OK-2-325-M (Ocklawaha Prairie wetland restoration)
Project OK-4-320-D (Surveying support for further acquisition of agricultural lands)

B) Preservation of Existing Habitat Program.
Project OK-4-331-D (Wetland mapping of the UORB)
Project OK-4-332-D (Inventory special species and unique or endangered habitats)
Project OK-4-330-M (Interagency support for existing acquisition programs, such as Save Our Rivers (SOR), the Conservation and Recreation Lands Trust Fund (CARL), and county land acquisition programs)

C) Regulation and Enforcement Program.
Project OK-4-340-M (Support enforcement of existing laws protecting wetland and upland natural habitats)
Project OK-1-112-M (Promulgation of special basin criteria for sensitive environments)
Project OK-5-413-M (Assist local governments in preparation of environmental protection ordinances)

D) Restoration of Normal Seasonal Water Level Fluctuations Feasibility Program.
Project OK-4-351-D (Photogrammetric topographic mapping)
Project OK-4-352-F (UORB floodplain study)
Project OK-4-353-F (Socioeconomic basin engineering study)
Project OK-2-354-M (Lake Fluctuation Schedule Revision)

E) Restoration Feasibility Program.
Project OK-2-361-M (Lake Denham Biomanipulation)
Project OK-2-360-F (Evaluate potential restoration strategies)
A variety of potential restoration strategies have been evaluated as part of the Lake Apopka SWIM Program. Results from Lake Apopka feasibility studies will be evaluated for applicability to UORB lakes. The Technical Advisory Group for the UORB SWIM Program may develop other restoration and preservation strategies. Specific project numbers will be assigned as restoration projects are developed.

PRIORITY ISSUE 4: INTERAGENCY COORDINATION

Issue Definition:

Local governments, the Water Management District, and state agencies must communicate and coordinate concerning the planning and implementation of restoration and conservation strategies for the significant water bodies within the Ocklawaha River basin.

Goal:

Active involvement of local governments in the development and implementation of the SWIM plan and the inclusion of SWIM related goals and objectives into local government comprehensive plans.

Strategies:

- Plan and implement programs to inform local governments and the general public about the SWIM planning efforts for the upper Ocklawaha River basin and encourage input into the SWIM plan revisions.
- Provide support in the development of local government comprehensive plans to facilitate inclusion of SWIM goals and objectives in local plans.
- Coordinate and implement SWIM goals into Local Development Regulations.
- Coordinate and cost-share in research, planning, and regulatory efforts.
- Support development of stormwater management programs by local governments.

Programs and Projects

A) Interagency Coordination Program.
Project OK-5-421-M (Local government and special interest group SWIM plan education and participation in the SWIM plan updates)
Project OK-5-422-M (Support for local government comprehensive plan preparation and formal review of plans)
Project OK-5-423-M (Assist local governments in preparation of environmental protection ordinances)
Project OK-5-424-M (District Water Management Plan development)
Project OK-1-111-M (Agricultural waste treatment facility cost sharing program)
Project OK-1-114-M (Mapping of permitted stormwater conveyance systems)
Project OK-1-115-M (Control of inadequate septic systems in the UORB)
Project OK-1-117-M (Assistance with stormwater management plan development)

PRIORITY ISSUE 5: PUBLIC AWARENESS AND PARTICIPATION

Issue definition:

Success in implementing the SWIM plan depends on support from the general public and local governments. The potential for local government support (in terms of manpower and funding), and the general public view of the worth of SWIM efforts is critical to the success of the SWIM program.

Goal:

Public education regarding the goals of the SWIM program, and the contributions that individual citizens and local governments can make towards environmental protection and restoration in the UORB.

Strategies:

- Plan and implement programs to inform local governments and the general public about the SWIM planning efforts for the UORB and encourage input into SWIM plan revisions.
- In cooperation with the WaterWays Environmental Education Program, coordinate educational programs about the SWIM program and environmental protection in the UORB for public schools.
- Develop activities involving the public or special interest groups centering on protection and restoration of the UORB.

Programs and Projects

A) Community Awareness Program.
Project OK-5-421-M (Local government and special interest group SWIM plan education and participation in the SWIM plan update process)
Project OK-6-521-M (Creation and distribution of informational materials)

B) Public Involvement Program.
Project OK-6-531-M (Public participation projects)

C) Education Program.
Project OK-6-541-M (Coordinate public school education programs)

TECHNICAL SUPPORT PROGRAM

Project OK-5-621-S (Administration of SWIM Program)
Project OK-5-622-S (Revision of SWIM Plan)
Project OK-5-623-S (UORB Technical Advisory Group)

FUNDING

Table 19 summarizes projected costs by project and fiscal year for the planning period, fiscal years 1993-1997. A more detailed breakdown of project budgets is included as part of the project descriptions in Chapter 9. Due to the dependence of the SWIM program on annual appropriations from the state legislature, there is no assurance that sufficient funds will be budgeted each year to meet the projected expenditures. Since the beginning of the SWIM program, the District has attempted to implement the planned project schedules as state appropriations have become smaller and other budgetary constraints have become tighter. From 1987 to 1991, the state's SWIM Trust Fund provided up to 80% of the cost of the SWIM Programs, with the Districts providing at least 20%. In 1991, the cost-share was legislatively revised to 60% funding from the state, and 40% funding from the Districts. Furthermore, the state appropriation to the trust fund has progressively decreased. In response, the District has typically contributed 50% or more of the funds each year.

Figure 19 shows the funding history for the UORB SWIM program, comparing projected expenditures from this and previous editions of the SWIM Plan with actual expenditures. The 'actual expenditures' are those reported to FDEP, and do not include District expenditures in excess of the required match funding levels or SWIM-related activities that were supported by other funding sources. The District overmatch was particularly high in FY92-93 and FY93-94; in each of these years total expenditures were closer to $1,000,000. The projected expenditures from the SWIM plans have substantially exceeded the subsequent funding levels, even if overmatch expenditures are considered. As a result, implementation of a number of projects has been delayed. At current levels of SWIM appropriations, it is unlikely that the major wetland restoration projects described in the plan can be fully funded through the SWIM program. In order to ensure that sufficient funds become available to implement the SWIM program, three measures are being pursued by the District:

- There is a need to develop a stable, long-term SWIM funding source. This would enable more realistic planning and budgeting, as well as strengthen and sustain interagency management committments.

TABLE 19. PRIORITY PROJECTS - PLAN BUDGET SUMMARY

	FY93-94	FY94-95	FY95-96	FY96-97
Project OK-1-111-M Agricultural waste treatment facility cost sharing program	$3,000	$1,440	$1,440	$1,440
Project OK-1-113-M Nutrient loading limits adoption	$6,000	$3,000	$0	$12,000
Project OK-1-114-M Mapping of permitted stormwater conveyance systems	$1,200	$1,200	$1,200	$1,200
Project OK-1-115-M Septic system control	$0	$0	$109,000	$56,000
Project OK-1-117-M Assistance with stormwater management system development	$3,000	$62,500	$92,500	$147,500
Project OK-4-121-D External nutrient budget and trophic state modeling	$116,800	$70,100	$182,200	$86,200
Project OK-4-122-D Internal nutrient budget study	$134,960	$14,400	$268,000	$12,000
Project OK-4-131-D Coordination of existing water quality monitoring programs	$1,200	$3,400	$4,500	$5,600
Project OK-4-231-D Investigation of metals and organic pollutants in sediments and biota	$3,360	$12,500	$116,900	$111,100
Project OK-4-321-D Investigation of marsh restoration techniques	$26,080	$32,200	$37,800	$38,400
Project OK-2-322-M Sunnyhill wetland restoration	$155,288	$240,750	$222,500	$551,000
Project OK-2-323-M Lake Griffin marsh flow-way	$127,660	$408,500	$580,000	$2,315,000
Project OK-2-324-M Emeralda Marsh Conservation Area restoration	$91,420	$287,500	$484,000	$780,000
Project OK-4-331-M Ocklawaha Prairie wetland restoration	$122,860	$98,000	$304,000	$2,130,500
Project OK-4-331-D Wetland mapping of the UORB	$0	$25,600	$8,400	$0

TABLE 19. (CONT'D) PRIORITY PROJECTS - PLAN BUDGET SUMMARY

	FY93-94	FY94-95	FY95-96	FY96-97
Project OK-4-332-D Inventory of special species and unique or endangered habitats	$0	$0	$0	$0
Project OK-4-352-F UORB floodplain study	$15,700	$18,000	$24,000	$0
Project OK-4-353-F Socioeconomic basin engineering study	$64,900	$10,800	$0	$0
Project OK-2-354-M Lake fluctuation schedule revision	$89,940	$140,900	$280,400	$12,300
Project OK-2-361-M Lake Denham biomanipulation	$13,620	$57,000	$56,400	$58,400
Project OK-5-421-M Local government and special interest group information and participation in SWIM	$5,768	$6,500	$6,500	$6,500
Project OK-5-422-M Local government comprehensive plan review	$0	$0	$0	$0
Project OK-5-423-M Local government environmental protection ordinance assistance	$2,290	$2,400	$2,640	$2,880
Project OK-5-424-M District Water Management Plan development	$0	$0	$0	$0
Project OK-6-521-M Creation and distribution of informational materials	$26,800	$27,800	$28,000	$29,200
Project OK-6-531-M Public participation projects	$6,520	$7,240	$7,740	$8,240
Project OK-6-541-M Coordination of public school education programs	$3,600	$13,600	$13,600	$13,600
Project OK-5-622-S Revision of SWIM plan	$6,860	$5,000	$0	$18,000
Project OK-5-623-S UORB Technical Advisory Group	$6,000	$6,000	$6,000	$6,000
Project OK-5-621-S Administration of SWIM program	$47,350	$49,100	$60,100	$62,500
TOTAL	$1,082,176	$1,605,430	$2,897,820	$6,465,560

Figure 19. Projected and actual expenditures for the UORB SWIM Program.

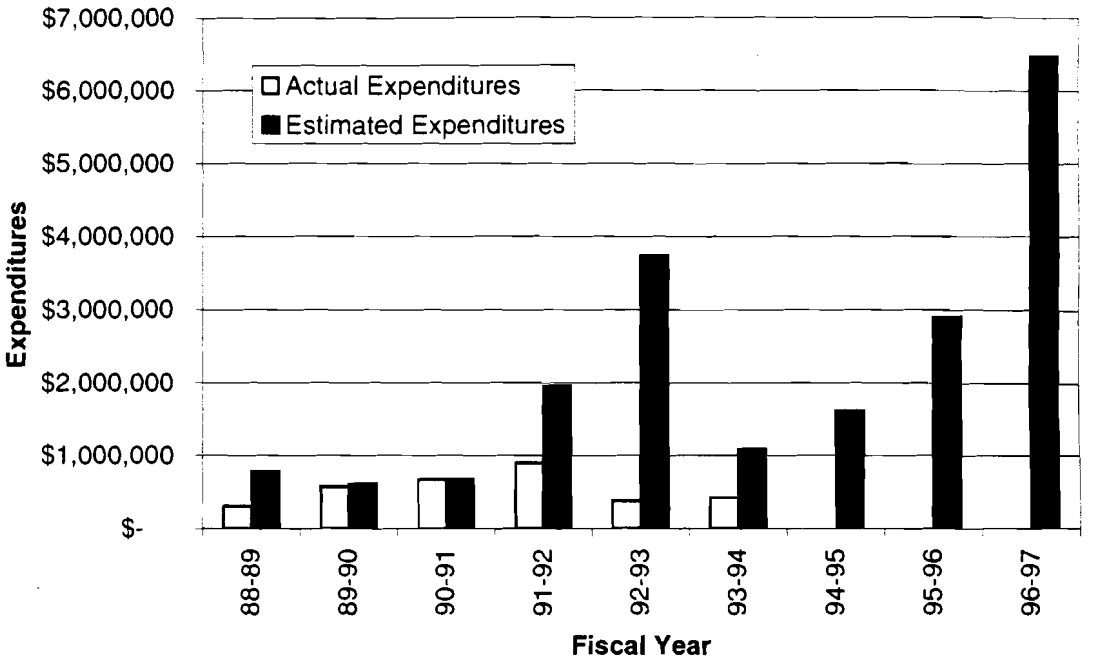
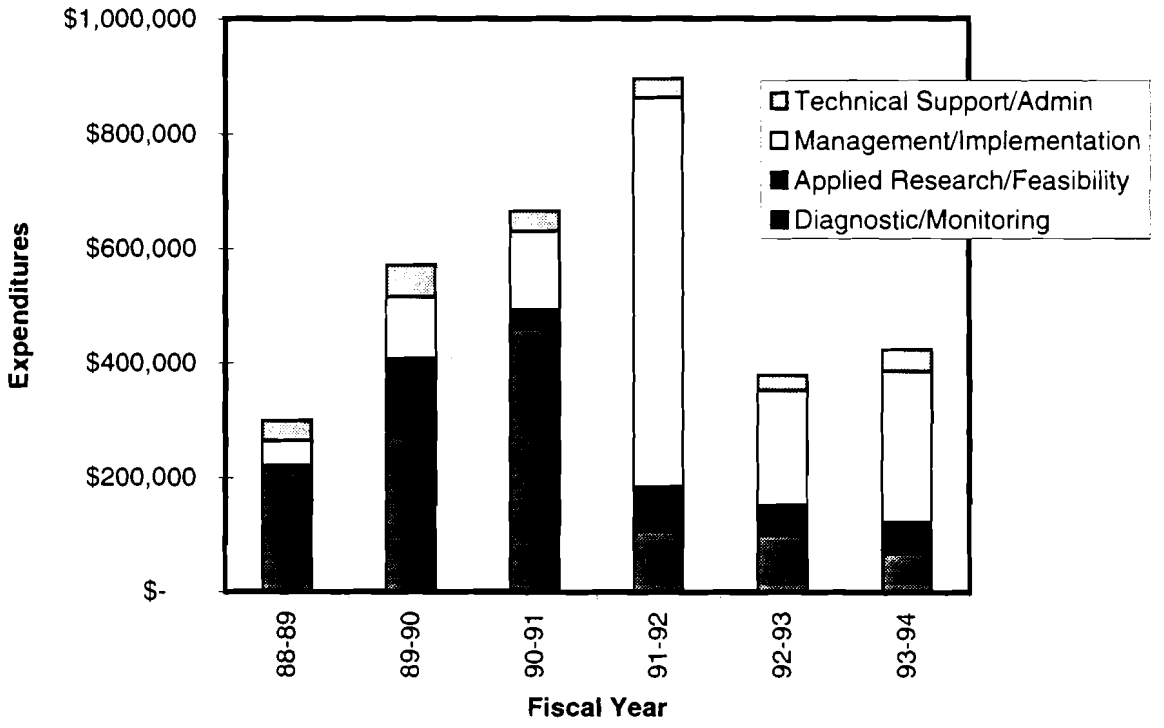


Figure 20. UORB SWIM Program expenditure history.



- Some SWIM projects have been supported through other District funding sources. In particular, many of the regulatory and interagency coordination projects have been supported through other funding sources.
- Supplemental funding sources are being pursued, including federal programs and joint funding with local governments. We are seeking federal funding for the major Sunnyhill and Ocklawaha Prairie wetland restoration projects through the Section 1135 Program authorized by the 1990 Water Resources Development Act. We have conducted several joint projects with local governments. Lake County jointly funded land use mapping of the basin. We cooperated with Lake County Water Authority in printing an educational booklet on freshwater wetlands. Lake County Water Authority also provided partial funding for the Lake Griffin Marsh Flow-way and the Internal Nutrient Budget Study.

Figure 20 summarizes the funding history of the UORB SWIM Program, distinguishing expended funds by project category (Diagnostic/Monitoring, Applied Research/Feasibility, Management/Implementation, or Technical Support/ Administration). In the early years of the program, much of the funding was directed to diagnostic projects conducted to evaluate the status of the water bodies and to reach a clear understanding of the causes of existing problems. Some major diagnostic studies remain to be completed, but in more recent years, the development of the major wetland restoration projects has directed much of the funding toward management/implementation projects.

8. A DESCRIPTION OF THE MEASURES NEEDED TO MANAGE AND MAINTAIN THE WATER BODY ONCE IT HAS BEEN RESTORED AND TO PREVENT FUTURE DEGRADATION

Completion of SWIM restoration projects cannot be the end of efforts to protect and manage surface waters in the upper Ocklawaha River basin. Continuing population growth and development in the basin necessitate ongoing monitoring and management efforts to maintain the improvements in water and habitat quality gained through restoration efforts. Efforts should be made to ensure a permanent funding mechanism for SWIM to ensure continuing protection of priority water bodies.

Management efforts currently in progress are summarized in Chapter 5, while those programs under development that are required to manage and maintain the UORB are incorporated into the program and project descriptions in Chapters 7 and 9. The management component is divided into four activities, as follows:

1) Public Awareness Program
It is essential that a comprehensive public information program be implemented for the UORB, including a historical perspective on how man degraded the system and the complexity and cost of restoration.

The public awareness program for the upper Ocklawaha River basin will involve two approaches. The first approach is to educate and inform the public about the importance and poor health of the basin and the goals and objectives of the SWIM plan. The second approach is to solicit active public support for, and participation in, SWIM and other resource planning and management efforts.

2) Regulatory Program
To attain and maintain the water and sediment quality required to assure the health of the upper Ocklawaha River basin, including fish and wildlife habitat and recreation, it is essential that a coordinated regulatory and preservation program be initiated concurrent with restoration studies. To be effective, the regulatory and preservation program will be coordinated with state, regional and local regulatory bodies, special interest groups and concerned citizens.

The Regulatory Program being developed incorporates several approaches, including enforcement of District agricultural discharge regulations, development of strengthened regulations and Special Basin Criteria, and technical assistance and

support for local government Comprehensive Plan development and regulatory ordinances.

3) Research Program
Monitoring programs are required to determine the continued health of the system. The monitoring programs being developed will coordinate water quality and biological monitoring efforts in the basin to most effectively and cost-efficiently assess the current status and trends in health of the UORB.

4) Water and Land Management Program
Water management structures and acquired lands must be managed properly to maintain the health of the UORB. The Marsh and Floodplain Restoration Program will develop and implement procedures for management of acquired lands. The most effective water regulation schedules will be developed through the Restoration of Normal Seasonal Water Level Fluctuations Feasibility program.

9. PRIORITY PROJECT DESCRIPTIONS

The following pages contain specific information on each priority project scheduled for implementation during fiscal years 1993-1997. Information presented in the project descriptions includes:

Project title and identification number.

Priority ranking, on a scale from one to three, high to low.

Issue Categories: identification of the priority issues at least partially fulfilled by the project. In many cases, a particular project addresses more than one issue. In Chapter 7, project titles were introduced under those issue(s) with which they were most closely associated.

Project Objectives: description of the major purpose for a particular project.

Justification/Rationale: the justification for the project, particularly with reference to the SWIM Act concerns that are addressed by the project.

Scope of Work: a description of the tasks needed to accomplish a project.

Status: Progress on project through March 1995

Budget Estimate: a preliminary estimate of cost by expenditure category. All costs are best estimates using whatever information could be gathered without formal bidding.

Projected Schedule: an approximate schedule for major project tasks and an indication, when possible, of the contractors responsible for each task.

PROJECT OK-1-111-M
AGRICULTURAL WASTE TREATMENT FACILITY COST SHARING PROGRAM

PRIORITY: 1

ISSUE CATEGORIES: Excessive Nutrient Levels; Hazardous Levels of Metals and Organic Pollutants; Interagency Coordination in Management.

PROJECT OBJECTIVES: To continue a matching grant program for construction of agricultural waste treatment facilities and implementation of selected best management practices.

JUSTIFICATION/RATIONALE: This project addresses three of the SWIM Act concerns: 1) Point and nonpoint pollution sources, 2) Correction and prevention of surface water problems, and 3) Interagency coordination in management. Discharges from agricultural operations appear to be a major source of excess nutrient levels in the UORB. Although regulatory efforts are underway to bring all agricultural operations in compliance with current regulations, matching funds may be required to make compliance with current or potentially more stringent future regulations economically feasible.

SCOPE OF WORK: Implement a matching grants program for construction of selected water quality-related best management practices, using conservation plans previously developed by USDA Soil Conservation Service for agricultural operations within the basin.

STATUS: Conservation plans have been developed for agricultural operations within the basin. The District has adopted a handbook and application procedure to distribute the funds.

PROJECT OK-1-111-M
AGRICULTURAL WASTE TREATMENT FACILITY COST SHARING PROGRAM

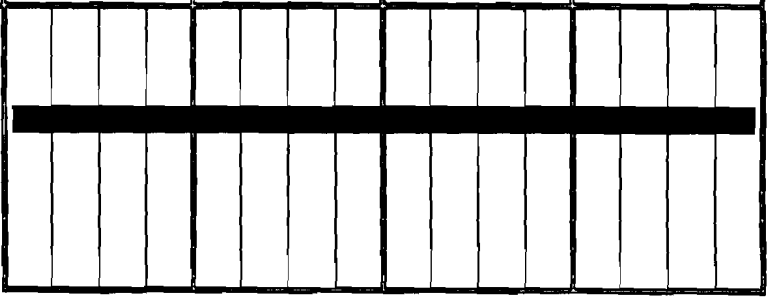
Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$2,500	$1,200	$1,200	$1,200
District Overhead	$500	$240	$240	$240
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services				
Equipment				
Non-SWIM Contracts	$100,000	$50,000	$50,000	$50,000
SWIM Total	$3,000	$1,440	$1,440	$1,440

Schedule

Task

Accept applications and issue grants.



PROJECT OK-1-112-M
SPECIAL BASIN CRITERIA DEVELOPMENT

PRIORITY: 2

ISSUE CATEGORIES: Excessive Nutrient Levels; Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats.

PROJECT OBJECTIVES: To develop and adopt Special Basin Criteria for the Upper Ocklawaha River Basin under Chapter 40C-41, F.A.C.

RATIONALE/JUSTIFICATION: This project will address two of the SWIM Act concerns: 1) Point and nonpoint pollution sources, and 2) Destruction/restoration of natural systems. Under Chapter 40C-41, F.A.C., the District may adopt special more stringent criteria to better protect a basin from future development pressures. Such criteria could offer stronger protection for existing natural habitats, better protect water quality, and provide buffer zones from future development for wetlands and water bodies. Special Basin Criteria can be most effectively developed through coordination with diagnostic projects assessing nutrient budgets and habitat preservation in the UORB.

SCOPE OF WORK: Development of Special Basin Criteria must incorporate information on nutrient budgets and habitat values gathered through the Nutrient Sources and Utilization program and the Preservation of Existing Habitat program. These projects must be completed before an evaluation of the appropriate Special Basin Criteria can be conducted. The District's rule development process provides a framework for the adoption of Special Basin Criteria under 40C-41, F.A.C. After completion of a rule draft, public workshops are held and comments solicited. Following completion of revisions, the Governing Board may adopt the new language for the District's regulatory program. From start to finish, the process takes approximately one year.

STATUS: Project to be developed.

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PROJECT OK-1-113-M
NUTRIENT LOADING LIMITS ADOPTION

PRIORITY: 1

ISSUE CATEGORIES: Excessive Nutrient Levels

PROJECT OBJECTIVES: To develop and adopt water-body-specific goals for reduction of pollutant loadings and nutrient standards for lakes and river segments within the UORB.

JUSTIFICATION/RATIONALE: This project primarily addresses one of the SWIM Act concerns: Point and nonpoint sources of pollution. Existing standards for controlling nutrient levels in discharge water are limited in effectiveness because the standards are too general and do not incorporate site specific data. By developing water body specific pollutant loading reduction goals, based on nutrient budgets or other information for the upper Ocklawaha River basin, more effective management will result. Under state water policy, Pollutant Load Reduction Goals (PLRGs) were required to be developed for all water bodies in the state, with the designated SWIM basins having highest priority for PLRG development. Interim PLRGs and schedules for development of final PLRGs were to be included in updated SWIM plans by December 31, 1994.

SCOPE OF WORK: Development of the nutrient reduction goals will be a joint effort with FDEP. Goals and standards should incorporate both point and nonpoint source control. This project will be developed in two phases. The requirement that interim PLRGs be developed by 1994 necessitated that their development precede the completion of the external and internal nutrient budgets. Interim PLRGs were developed using interim results of the nutrient budget studies. In the second phase, final PLRGs will be developed incorporating the final results of the nutrient budget studies. Alternative strategies could be implemented more quickly, including establishing nutrient limits through a policy directive based on the best available existing information, or designation of the water body as an Outstanding Florida Water.

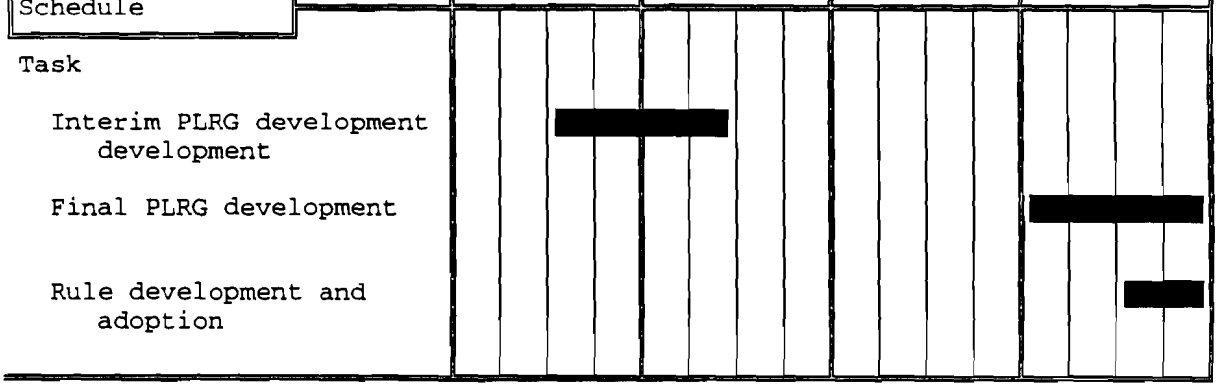
STATUS: A Phase I external nutrient budget has been completed for the major lakes in the UORB (report in review). Based on this study, the recommended interim PLRG for the UORB is a combination of reduction of discharges from muck farms to the levels expected from wetland systems, with reduction in Apopka-Beauclair Canal total phosphorus concentrations to the level expected under the Lake Apopka PLRGs. These actions are predicted to affect primarily the lakes in the basin with the poorest water quality, Lakes Beauclair, Dora, Eustis, and Griffin, reducing estimated total phosphorus

PROJECT OK-1-113-M
NUTRIENT LOADING LIMITS ADOPTION

loadings in these lakes by 48 - 79%. Development of final PLRGs is expected to begin in FY96-97, following completion of external and internal nutrient budget studies, and be completed during FY97-98.

Budget Estimate	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$5,000	$2,500		$10,000
District Overhead	$1,000	$500		$2,000
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services				
Equipment				
Total	$6,000	$3,000		$12,000

Schedule



PROJECT OK-1-114-M
MAPPING OF PERMITTED STORMWATER CONVEYANCE SYSTEMS

PRIORITY: 2

ISSUE CATEGORIES: Excessive Nutrient Levels; Potential Hazardous Levels of Metals and Organic Pollutants; Interagency Coordination in Management

PROJECT OBJECTIVES: Stormwater discharges are potentially major contributors to pollution of the UORB, and a source that is likely to increase in importance with increasing urbanization of the basin. The objective of this project is to map stormwater conveyance systems that are permitted pursuent to Chapters 40C-40 and 40C-4, F.A.C., as an aid to determining their effect on the quality of surface waters.

JUSTIFICATION/RATIONALE: This project addresses three of the SWIM Act concerns: 1) Point and nonpoint pollution sources, 2) Research for better management, and 3) Interagency coordination in management. Mapping of major stormwater discharges which have obtained MSSW permits will provide information for development of the external nutrient budgets for UORB lakes, as well as assist District and local government regulatory staff in development of stormwater master plans and enforcement of stormwater discharge regulations.

SCOPE OF WORK: Continue to map permitted stormwater conveyance systems using GIS mapping facilities. Smaller systems, such as those obtaining a 40C-42 permit are not mapped, but they are required to install a treatment system

STATUS: Continuing program to map MSSW permits when received.

PROJECT OK-1-114-M
MAPPING OF PERMITTED STORMWATER CONVEYANCE SYSTEMS

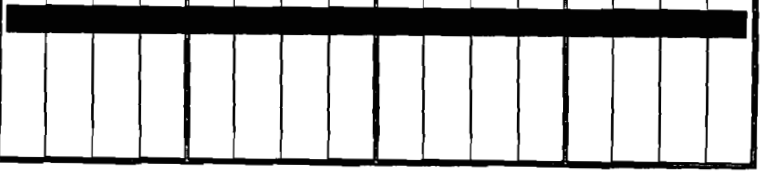
Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$1,000	$1,000	$1,000	$1,000
District Overhead	$200	$200	$200	$200
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services				
Equipment				
Total	$1,200	$1,200	$1,200	$1,200

Schedule

Task

Digitize MSSW permits on GIS system



PROJECT OK-1-115-M
SEPTIC SYSTEM CONTROL

PRIORITY: 2

ISSUE CATEGORIES: Excessive Nutrient Levels; Interagency Coordination in Management

PROJECT OBJECTIVES: To determine the extent of inadequate systems in the basin and enforce septic system regulations in the basin.

RATIONALE/JUSTIFICATION: This project addresses the following SWIM Act concerns: 1) Point and nonpoint pollution sources, 2) Correction and prevention of surface water problems, and 3) Improved coordination in management. Inadequate and failing septic tank systems are a potentially important source of surface water pollution in the UORB. Local government staffing is insufficient to adequately survey and enforce existing regulations for septic systems.

SCOPE OF WORK: Contract with Marion and Lake County Health Units to investigate problem areas to determine whether septic systems are functional and not causing surface water pollution. Where inadequate or failed systems are located, the County Health Units will initiate and pursue enforcement actions under existing statutes. To accomplish this goal, the District will provide in kind funding to create a survey and enforcement team to investigate and enforce septic system regulations in the basin.

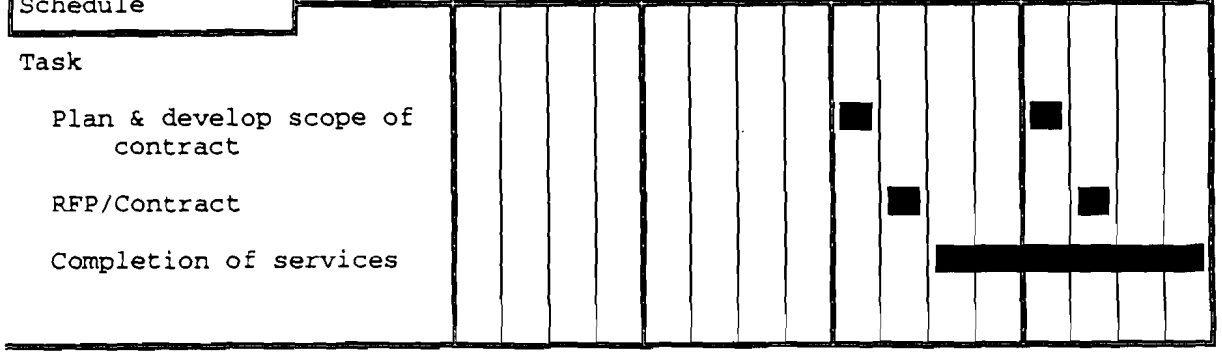
STATUS: Project to be developed. The Lake Weir eutrophication study indicates that septic tank effluents are a significant and increasing contributor to water quality problems in the lake (see report summary in Appendix F). Also, the Phase I external nutrient budget for the basin indicates that septic tank effluents are most significant as a contributor to nutrient loading in Lake Weir (estimated as 6.4% of phosphorus loading and 9.5% of nitrogen loading to Lake Weir, while in the other lakes septic tank effluents accounted for less than 3% of phosphorus loading and no more than 4.1% of nitrogen loading). However, proposed changes in regulation schedules for the Ocklawaha Chain-of-Lakes could result in inundation of septic tank drain fields in the Lake Griffin basin. Therefore, the priorities for the septic system control project are Lake Weir and Lake Griffin, if the proposed changes in the regulation schedule are implemented.

PROJECT OK-1-115-M
SEPTIC SYSTEM CONTROL

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits			$7,500	$5,000
District Overhead			$1,500	$1,000
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services			$100,000	$50,000
Equipment				
Total			$109,000	$56,000

Schedule



PROJECT OK-1-116-M
DIGITIZATION OF USGS TOPOGRAPHIC QUADRANGLE MAPS

PRIORITY: Completed

ISSUE CATEGORIES: Excessive Nutrient Levels; Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats

PROJECT OBJECTIVES: To digitize coverages of data from USGS topographic quadrangle maps of the UORB to produce an ARC/INFO data set. The coverages to be digitized include roadways, water courses, surface water bodies, county boundaries, city/town section lines, and township/range boundaries.

JUSTIFICATION/RATIONALE: This project is necessary to provide a corrected base map upon which the results of other mapping projects will be overlaid. These other mapping projects include mapping of stormwater discharge systems, land use, and wetlands. As such, this project will help fulfill all of the SWIM Act concerns addressed by the other mapping projects: 1) Point and nonpoint pollution sources, 2) Research for better management, 3) Interagency coordination in management, and 4) Destruction/restoration of natural systems.

SCOPE OF WORK: The input documents for this project will be the most current U.S. Geological Survey's 7.5 minute topographic quadrangle maps. The data will be digitized using ARC/INFO software. The roadways, watercourses, and section lines will be encoded as lines; waterbodies, townships, and ranges will be encoded as polygons; county boundaries will be encoded as polygons and lines; and cities/towns will be encoded as points.

STATUS: Complete.

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PROJECT OK-1-117-M
ASSISTANCE WITH STORMWATER MANAGEMENT PLAN DEVELOPMENT

PRIORITY: 2

ISSUE CATEGORIES: Excessive Nutrient Levels; Potential Hazardous Levels of Metals and Organic Pollutants; Interagency Coordination in Management

PROJECT OBJECTIVES: Provide assistance to local governments in development of plans and facilities for stormwater management for major drainage basins in the UORB.

JUSTIFICATION/RATIONALE: This project addresses three of the SWIM Act concerns: 1) Point and nonpoint pollution sources, 2) Correction and prevention of surface water problems, and 3) Interagency coordination in management. Stormwater discharges are significant contributors to pollution of the UORB, and a source that is likely to increase in importance with increasing urbanization of the basin.

SCOPE OF WORK: Identification of priority watersheds for development of stormwater management plans from delineation of stormwater runoff potential developed through the External Nutrient Budget study and from known flooding problem areas. Cooperate/cost-share with local governments in development of comprehensive stormwater management plans for priority watersheds.

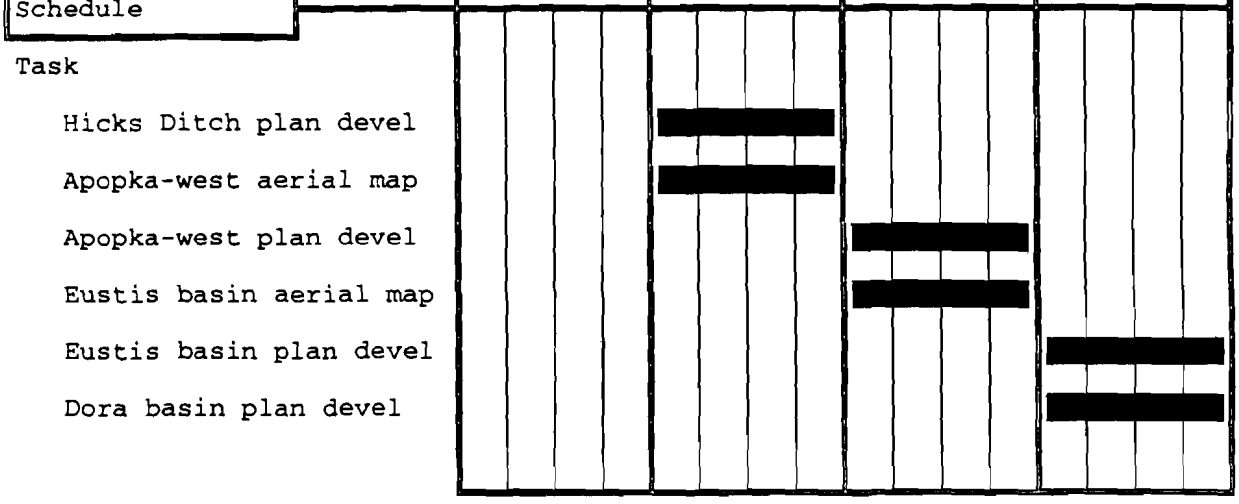
STATUS: An agreement has been developed with Lake County to a 50/50 cost-share for development of stormwater management plans for priority watersheds. In FY94-95, a stormwater management plan will be developed for the Hicks Ditch basin, and aerial photogrammetry will be obtained for the area west of Lake Apopka, in preparation for development of a management plan for this area in FY95-96. The Apopka-area contracts will not be supported by the UORB SWIM Program as it is outside the basin boundaries. In future years, tentative plans call for development of stormwater management plans in priority watersheds of the Lake Eustis and Dora basins.

PROJECT OK-1-117-M
ASSISTANCE WITH STORMWATER MANAGEMENT PLAN DEVELOPMENT

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$2,500	$50,000	$50,000	$50,000
District Overhead	$500	$12,500	$12,500	$12,500
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services			$30,000	$85,000
Equipment				
Non-SWIM Funding		$170,000	$140,000	$85,000
SWIM Total	$3,000	$62,500	$92,500	$147,500

Schedule



PROJECT OK-4-121-D
EXTERNAL NUTRIENT BUDGET AND TROPHIC STATE MODELING

PRIORITY: 1

ISSUE CATEGORIES: Excessive Nutrient Levels

PROJECT OBJECTIVES: To quantify exchanges of water and nutrients between the watershed and water bodies in the UORB. Employ trophic state modeling to predict effects of alternative restoration and management actions on water quality.

JUSTIFICATION/RATIONALE: This is an essential first step in the restoration and management effort. This project addresses three of the SWIM Act concerns: 1) Point and nonpoint pollution sources - measurement of external nutrient loading is necessary to determine the need for, and efficacy of, special basin criteria and strengthened pollution load reduction goals for UORB waters. 2) Research for better management- information on the external nutrient budget is necessary for selecting appropriate and cost-effective restoration and management strategies. 3) Correction and prevention of surface water problems. Coupling predictive trophic state models with pilot feasibility projects will provide cost-effective and scientifically sound methods to evaluate techniques for water body restoration and management.

SCOPE OF WORK: Identification of all important point and nonpoint source discharges to and from major water bodies of the UORB. Quantification of exchanges of water and nutrients. Development of water and nutrient budgets. Phase I will collate and analyze existing information to develop preliminary nutrient budgets for the major lakes in the basin, use lake trophic state models to predict effects of alternative restoration and management actions, develop recommendations for interim PLRGs, and identify major information needs and recommend further studies required to develop restoration and management programs and formulate final PLRGs. Phase II will include targeted studies to fill major information gaps and refine lake nutrient budgets and trophic state models.

STATUS: A draft report on the Phase I nutrient budgets and trophic state modeling for seven lakes in the UORB (Lakes Beauclair, Dora, Eustis, Harris, Griffin, Yale, and Weir) is under review. Upstream tributaries were major nutrient sources for Lakes Beauclair, Dora, Eustis, and Griffin (for example, discharges through the Apopka-Beauclair Canal accounted for 85% of total estimated phosphorus loading to Lake Beauclair). Discharges from muck farms were the major source of phosphorus for Lake Griffin (59% of total estimated phosphorus loading). Nutrient loadings to Lakes Harris-Little Harris, Yale, and Weir were divided among a number of sources, with no single one dominant (Fulton in prep.).

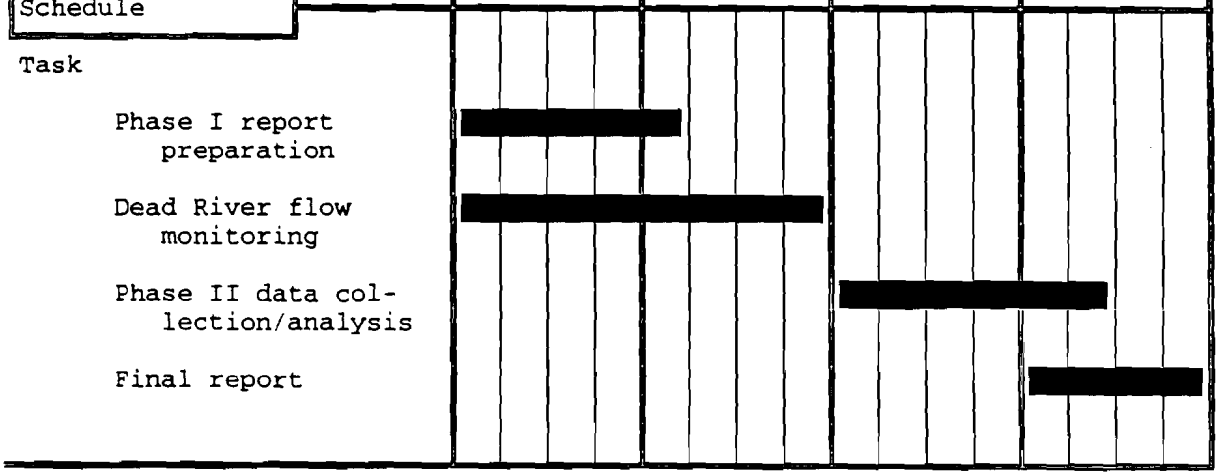
PROJECT OK-4-121-D
EXTERNAL NUTRIENT BUDGET AND TROPHIC STATE MODELING

As part of the nutrient budget study, lake trophic state models were used to predict effects of alternative restoration and management actions on phosphorus loading and water quality. Targeted studies are being developed to fill major information needs and refine the external nutrient budgets. USGS has been contracted to measure flows between Lakes Harris and Eustis, filling one of the major information needs for the nutrient budgets (see UORB Floodplain Study).

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$52,600	$40,000	$60,000	$70,000
District Overhead	$10,520	$8,000	$12,000	$14,000
Expenses				
Travel	$100	$100	$200	$200
Supplies	$11,480	$5,000	$10,000	$2,000
Miscellaneous				
Contracted Services	$17,000	$17,000	$100,000	
Equipment	$25,100			
Total	$116,800	$70,100	$182,200	$86,200

Schedule



PROJECT OK-4-122-D
INTERNAL NUTRIENT BUDGET STUDY

PRIORITY: 1

ISSUE CATEGORIES: Excessive Nutrient Levels

PROJECT OBJECTIVES: To determine sedimentary storage of nutrients and net rates of nutrient accumulation in sediments.

JUSTIFICATION/RATIONALE: This project addresses three of the SWIM Act concerns: 1) Research for better management - evaluation of internal nutrient dynamics will be combined with loading from external sources in trophic state models to allow ecologically sound selection of restoration and management techniques. 2) Point and nonpoint pollution sources - a complete nutrient budget (external and internal) is necessary to determine the efficacy of strengthened pollutant load reduction goals. 3) Correction and prevention of surface water problems. Trophic state models incorporating external and internal nutrient dynamics will provide cost-effective and scientifically sound methods to evaluate techniques for water body restoration and management.

SCOPE OF WORK: Measurement of concentrations and chemical forms of nutrients in water and sediments, net rates of sedimentation of nutrients, reconstruction of historic trophic state from sedimentation rates and paleolimnological analyses of sedimentary diatoms.

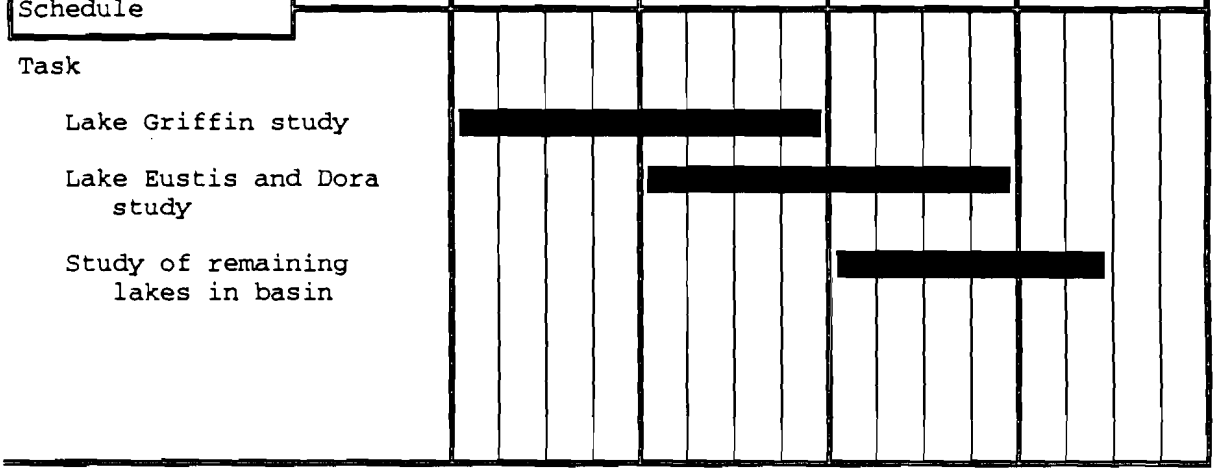
STATUS: A study of sediment and nutrient deposition in Lake Griffin was contracted in August 1993 (funded by Lake County Water Authority). Phase I of this study is expected to be completed by April 1995. Studies of sediment and nutrient deposition in Lakes Eustis and Dora were contracted in August 1994.

PROJECT OK-4-122-D
INTERNAL NUTRIENT BUDGET STUDY

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$8,300	$12,000	$15,000	$10,000
District Overhead	$1,660	$2,400	$3,000	$2,000
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services	$125,000		$250,000	
Non-SWIM Contracts		$65,000		
SWIM Total	$134,960	$14,400	$268,000	$12,000

Schedule



PROJECT OK-4-123-D
LAND USE MAPPING OF THE UORB

PRIORITY: Completed

ISSUE CATEGORIES: Excessive Nutrient Levels; Interagency Coordination in Management

PROJECT OBJECTIVES: Significant changes have occurred in land use in the UORB since the last maps were completed in 1972. The objective of this project is to update the original mapping using the most recently available DOT aerial photography.

RATIONALE/JUSTIFICATION: This project addressed two of the SWIM Act concerns: 1) Point and nonpoint pollution sources - this information will be used in developing preliminary external nutrient budgets, and will also be used in stormwater and other nonpoint pollution management. 2) Interagency coordination in management- the information will be available for regional planning, such as local government comprehensive planning. This project was conducted jointly with Lake County.

SCOPE OF WORK: Photo interpretation of aerial photography. Ground truthing. Digitization of data and entry into G.I.S. mapping system for future trend and other analyses.

STATUS: Complete.

PROJECT OK-4-124-D
BATHYMETRIC AND SEDIMENT MAPPING OF MAJOR LAKES IN THE UORB

PRIORITY: Completed

ISSUE CATEGORIES: Excessive Nutrient Levels

PROJECT OBJECTIVES: Existing bathymetric maps of the UORB lakes date from the early 1970's. Rapid sedimentation, particularly in the more eutrophic lakes downstream of Lake Apopka, may have significantly changed bathymetric profiles since that time. There is no information available on sediment depths for many of the major lakes in the UORB. The objective of this project is to develop one foot bathymetric and sediment depth contour maps for the major lakes of the UORB.

JUSTIFICATION/RATIONALE: This project addressed two of the SWIM Act concerns: 1) Point and nonpoint pollution sources- accurate bathymetric maps are necessary to develop both external and internal nutrient budgets, while sediment depth profiles are essential for measuring internal nutrient loading in the major lakes in the UORB. As discussed in the project descriptions for external and internal nutrient budgets, these measurements of nutrient loading are necessary to determine the efficacy of strengthening controls on existing nutrient sources. 2) Research for better management- mapping of sediment depth profiles is necessary to evaluate the usefulness of mechanical and biological means of sediment removal as a method for reducing internal nutrient loading to the lakes.

SCOPE OF WORK: Fathometer tracings; LORAN-C positioning; sediment coring profiles.

STATUS: Complete.

Report:

Danek, L.J., T.A. Barnard, and M.S. Tomlinson. 1991. Bathymetric and sediment thickness analysis of seven lakes in the Upper Oklawaha River Basin. St. Johns River Water Management District Special Publication SJ 91-SP14, Palatka, FL.

PROJECT OK-4-125-D
LAKE WEIR EUTROPHICATION STUDY

PRIORITY: Completed

ISSUE CATEGORIES: Excessive Nutrient Levels

PROJECT OBJECTIVES: To assess the history of cultural eutrophication in Lake Weir, the important causes responsible for deterioration in water quality, and the current status of the lake. Using this information, management recommendations were designed to restore and maintain water quality in the lake.

JUSTIFICATION/RATIONALE: This project addressed three of the SWIM Act concerns: 1) Point and nonpoint pollution sources- the Secchi disc survey provided an inexpensive method for ranking the relative importance of nonpoint pollution sources. 2) Research for better management- the information provided from the studies will be used to prepare management plans. 3) Public awareness and education- the Citizen-based Secchi disc survey provided an opportunity for direct public involvement in monitoring and restoration efforts.

SCOPE OF WORK: Assess historical development of Lake Weir's watershed and associated nutrient inputs into the lake. Monitoring of Secchi disc transparency, water chemistry, plankton, benthos, aquatic macrophytes; reconstruction of historical trends in water quality from analysis of lake sediment cores; development of management plans for restoration and maintenance of water quality.

STATUS: Complete. Conclusions of the study include that stormwater runoff and septic tank effluents from increasing populations in the watershed are significant and increasing contributors to cultural eutrophication in the lake. Also, agricultural runoff remains a major nutrient source for the lake. See the report summary in Appendix F for further discussion.

Report:
Crisman, T.L., J.R. Beaver, J.K. Jones, A.E. Keller, A.G Neugaard, and V. Nilakantan. 1992. Historical assessment of cultural eutrophication in Lake Weir, Florida. St. Johns River Water Management District Special Publication SJ 92-SP12, Palatka, FL.

PROJECT OK-4-126-D
ASSESSMENT OF PHYTOPLANKTON PRODUCTIVITY, NUTRIENT RELATIONSHIPS, AND COMPOSITION

PRIORITY: 3

ISSUE CATEGORIES: Excessive Nutrient Levels

PROJECT OBJECTIVES: To determine temporal trends in phytoplankton productivity, limitations to productivity, and species composition of phytoplankton in major lakes in the UORB.

JUSTIFICATION/RATIONALE: Nuisance algal blooms resulting from excessive phytoplankton growth are a primary symptom of eutrophication in the UORB. However, little is known about phytoplankton dynamics, nutrient relationships, or composition in the UORB. In general, nutrient loading can explain only about 50% of the variability in phytoplankton productivity; while in Florida no significant correlation has been found between lake trophic state index and calculated nutrient loading (DER. 1988. Report to the Governor, Speaker of the House of Representatives, and President of the Senate: Data needed for the development of a DER nutrient discharge rule). In addition to increasing productivity, eutrophication often favors algal species that are toxic or of poor nutritional value to higher trophic levels, adding further uncertainty to prediction of effects of eutrophication on aquatic food chains supporting sport fisheries. Therefore, understanding of phytoplankton dynamics and composition is necessary to predict responses to restoration and management actions. Thus, this project addresses two of the SWIM Act concerns: 1) Research for better management, and 2) Point and nonpoint pollution sources.

SCOPE OF WORK: Monitor phytoplankton productivity and composition in major lakes of the UORB in conjunction with chemical monitoring. Conduct nutrient addition and nutrient dilution bioassays.

STATUS: Project to be developed.

PROJECT OK-4-131-D
COORDINATION OF EXISTING WATER QUALITY MONITORING PROGRAMS

PRIORITY: 1

ISSUE CATEGORIES: Excessive Nutrient Levels, Potential Hazardous Levels of Metals and Organic Pollutants, Interagency Coordination.

PROJECT OBJECTIVES: Water quality monitoring is presently conducted in the UORB by a variety of agencies, including SJRWMD, FDEP, FGFWFC, and Lake County Environmental Services (LCES). These agencies test the waters of the UORB for varying parameters on different schedules. As a result, there may be redundancies of sampling and analysis or omissions in coverage. The purpose of this project is to provide timely and accurate water quality data to all interested parties.

RATIONALE/JUSTIFICATION: This project will address three of the SWIM Act concerns: 1) Research for better management, 2) Interagency coordination in management, and 3) Point and nonpoint pollution sources. The intensive effort conducted during the Nutrient Budget studies cannot be maintained over a long time period. It will be the responsibility of long-term monitoring programs to detect deviations from baseline conditions established during the Nutrient Budget studies. A well-designed monitoring program will detect developing water quality problems and may, in some cases, be able to identify the pollution sources causing the problems. In most cases, however, detailed studies will have to be established to determine the causes for developing problems identified by the monitoring program.

SCOPE OF WORK: Phase I of the External Nutrient Budget study involves collation and analysis of existing water quality data. This will also serve to identify gaps or redundancies in current monitoring programs. Initiate coordination of monitoring efforts through the Technical Advisory Committee, which includes representatives of agencies involved in monitoring of the UORB. Full review and implementation of a coordinated monitoring program will be addressed following completion of the Nutrient Budget studies, and the surveys of Metals and Organic Pollutants. Implementation will involve coordinating current water quality sampling requirements of all agencies, eliminating redundant sampling and analyses, filling omissions in coverage, maintaining a high level of quality assurance, and providing for future water quality sampling needs.

PROJECT OK-4-131-D
COORDINATION OF EXISTING WATER QUALITY MONITORING PROGRAMS

STATUS: Entry of LCES's backlogged water quality data into STORET was completed; newly collected data is being entered as available. Split sampling exercises have been initiated among SJR and LCES. We are also coordinating with FDEP in development of the state-wide surface water ambient monitoring program (SWAMP).

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$1,000	$2,000	$2,500	$3,000
District Overhead	$200	$400	$500	$600
Expenses				
Travel				
Supplies		$1,000	$1,500	$2,000
Miscellaneous				
Contracted Services				
Equipment				
Other:				
Chemical Analyses	No charge	to SWIM		
Total	$1,200	$3,400	$4,500	$5,600

Schedule

Task

Interagency coordination of monitoring

PROJECT OK-4-132-D
BIOLOGICAL MONITORING OF THE UORB SYSTEM

PRIORITY: 3

ISSUE CATEGORIES: Excessive Nutrient Levels, Potential Hazardous Levels of Metals and Organic Pollutants.

PROJECT OBJECTIVES: Implement a biomonitoring program for detecting aquatic life impairments and assessing their relative severity.

JUSTIFICATION/RATIONALE: This project will address three of the SWIM Act concerns: 1) Research for better management, 2) Destruction/restoration of natural systems, and 3) Point and nonpoint pollution sources. Biomonitoring has several potential advantages in detecting impairments and documenting recovery following control actions, including: 1) Biological communities reflect overall ecological integrity, 2) Biological communities integrate the effects of different pollutant stressors, 3) Biotic responses also integrate pollutant stresses over time, which may allow detection of pollutant effects that can be missed by discrete chemical measurements, 4) Routine biomonitoring can be relatively inexpensive, 5) The status of biological communities is of direct interest to the public. The causes for biotic impairment are often difficult to interpret, but biotic monitoring is potentially a useful complement to chemical monitoring.

SCOPE OF WORK: Evaluate existing bioassessment methods, and implement methods appropriate for the UORB system. Bioassessment protocols for streams and rivers using fish and benthic macroinvertebrates developed by US EPA (Plafkin, et al. 1989). are being adapted Florida waters (Hulbert, personal communication). Development of protocols for lake systems is likely to proceed more slowly, and other taxa, such as algae, may be more appropriate indicators for the environmental problems in the UORB lakes.

STATUS: Project to be developed.

Reference: Plafkin, J.L., M.T. Barbour, K.D. Porter, S.K. Gross, and R.M. Hughes. 1989. Rapid bioassessment protocols for use in streams and rivers: benthic macroinvertebrates and fish. US EPA, Washington, D.C. EPA/444/4-89-001

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PROJECT OK-4-231-D
INVESTIGATION OF METALS AND ORGANIC POLLUTANTS IN SEDIMENTS AND BIOTA

PRIORITY: 2

ISSUE CATEGORIES: Potential Hazardous Levels of Metals and Organic Pollutants

PROJECT OBJECTIVES: To investigate levels and trends of toxic metals and synthetic organic pollutants as a function of location in the UORB. To determine if concentrations of pollutants in the sediments, water column, and biota in the UORB exceed state standards or represent a hazard to human health or the environment.

JUSTIFICATION/RATIONALE: This project addresses two of the SWIM Act concerns: 1) Research for better management- knowledge of pollutant concentrations is necessary to determine the safety of dredging and recycling of sediments, the safety of consumption of fish caught in the UORB, and threats to the health of habitats and wildlife. 2) Point and nonpoint pollution sources- data on spatial patterns of pollutants should provide some information on pollutant sources and the efficacy of strengthened controls on discharges.

SCOPE OF WORK: Measure pollutant concentrations in sediments, water column, and biota, at a network of stations in the UORB. Further studies will focus in detail on areas and pollutants for which the screening analysis reveals potential problems.

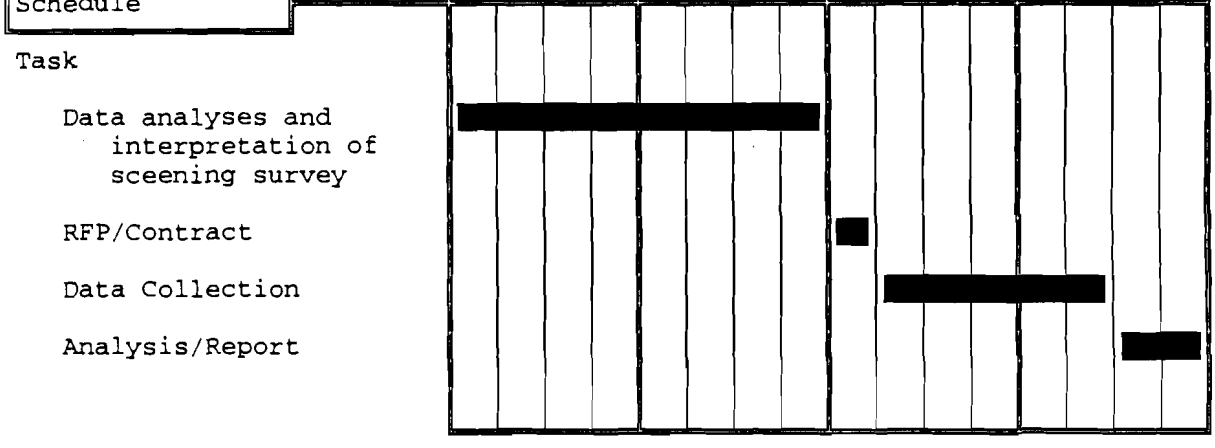
STATUS: Initial screening analyses, measuring a wide range of pollutants at representative stations in major water bodies and tributaries, were performed during FY89/90. Data interpretation has been delayed pending development of sediment quality assessment guidelines. To provide a basis for developing further studies, a preliminary interpretation has been initiated using sediment quality assessment guidelines developed for Florida marine-estuarine systems and other guidelines under development for freshwater sediments.

PROJECT OK-4-231-D
INVESTIGATION OF METALS AND ORGANIC POLLUTANTS IN SEDIMENTS AND BIOTA

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$2,800	$10,000	$12,000	$8,000
District Overhead	$560	$2,000	$2,400	$1,600
Expenses				
Travel			$500	$500
Supplies		$500	$2,000	$1,000
Miscellaneous				
Contracted Services			$100,000	$100,000
Equipment				
Total	$3,360	$12,500	$116,900	$111,100

Schedule



PROJECT OK-4-321-D
INVESTIGATION OF MARSH RESTORATION TECHNIQUES

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat

PROJECT OBJECTIVES: To examine vegetation germination and growth at Sunnyhill Farm marsh and other wetland restoration projects in the basin in relation to environmental conditions, including water depth and time of inundation. Develop strategies for further marsh restoration, which may include control of hydrology, vegetation planting, or control of noxious vegetation by herbicides or other means.

JUSTIFICATION/RATIONALE: Agricultural development and stream channelization has resulted in loss of valuable wetland habitat in the UORB. Proper management is necessary to encourage the development of desirable emergent marsh vegetation and to restore flow through the historic river floodplain at Sunnyhill Farm and other recently acquired properties. Thus, this project addresses two of the SWIM Act concerns: 1) Research for better management, and 2) Destruction/restoration of natural systems.

SCOPE OF WORK: Complete ground vegetation surveys; delineation of vegetation from aerial photography; advise on strategies for wetland restoration.

STATUS: A completed report by Brown and Tighe (1992) included results of ground surveys in 1989-90, interpretation of aerial photos taken in Oct 1990, and recommendations for wetland restoration. Aerial photos have been taken annually since 1991 and are being interpreted by District staff to determine temporal changes in vegetation cover. Environmental Services, Inc., conducted spring and fall ground vegetation surveys in 1992 - 1995. The Land Planning Group, Inc. has been contracted to conduct vegetation surveys in 1995.

Vegetation surveys conducted at Sunnyhill Farm have shown consistent relations between water depth and distributions of rooted emergent and floating wetland plants. Rooted emergents have been largely restricted to average water depths of less than two feet, while floating species occur at average depths greater than zero. This information has been valuable in developing regulation schedules which have provided some control of undesirable floating species (especially water hyacinth, *Eichhornia*). Although distribution patterns of floating and rooted emergent functional groups have been consistent, there has been substantial within- and between-year variability in distribution of individual species. Few clear distinctions have been apparent between distribution patterns of desirable and undesirable (e.g. cattail, *Typha*) emergent plant species.

PROJECT OK-4-321-D
INVESTIGATION OF MARSH RESTORATION TECHNIQUES

Report:
Brown, M.T., and R.E. Tighe. 1992. Vegetation composition and cover at Sunnyhill Farm. St. Johns River Water Management District Special Publication SJ93-SP8, Palatka, FL.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$5,300	$6,000	$6,500	$7,000
District Overhead	$1,060	$1,200	$1,300	$1,400
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services	$19,720	$25,000	$30,000	$30,000
Equipment				
Total	$26,080	$32,200	$37,800	$38,400

Schedule

PROJECT OK-2-322-M
SUNNYHILL WETLAND RESTORATION

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat; Excessive Nutrient Levels

PROJECT OBJECTIVES: To re-establish flow through the historic river channel and floodplain at Sunnyhill Farm. To improve habitat value of the wetlands area for fish and wildlife. To improve water quality in the Ocklawaha River through nutrient uptake by the floodplain-wetland system. To provide recreational opportunities on the restored lands. Water control structures will be constructed to divert a large portion of the flow in the Ocklawaha Canal through the historic river channel and floodplain and to improve capabilities for regulation of water flow through the floodplain-wetland system. Sufficient flow will be maintained in the Ocklawaha Canal for navigational purposes.

JUSTIFICATION/RATIONALE: This river channel and floodplain wetland restoration will address three of the SWIM Act concerns: 1) Destruction/ restoration of natural systems. Approximately 2800 acres of former muck farm will be converted to wetland habitat. 2) Correction and prevention of surface water problems. Conversion of the former muck farm area to marsh will reduce pollutant inputs from the farm and surrounding uplands to the Ocklawaha River. 3) Point and nonpoint pollution sources. Uptake of riverborne dissolved nutrients and suspended sediments by the wetland system is expected to improve water quality in the Ocklawaha River downstream of Sunnyhill Farm. The wetland will also utilize nonpoint source pollutants entering the system from surrounding uplands.

SCOPE OF WORK: Interim management of water levels to promote wetlands development in the former agricultural fields. Remove accumulated sediments and woody vegetation from the river channel, recontour the river channel to restore water flows similar to natural historic patterns, remove ditches and levees to restore uninterrupted floodplain wetlands. Design and install intake structure to divert flow from the Ocklawaha Canal through the Sunnyhill floodplain wetland system. Install downstream water regulatory structure to control water elevations inside the wetland system. Re-vegetate wetland areas primarily by natural germination, supplemented where necessary by planting or seeding of hardwood and herbaceous species.

STATUS: Interim management has allowed development of of about 1700 acres of wetland habitat in the former agricultural fields. Water quality has improved somewhat in impounded wetlands that have developed in the former agricultural area, but remains poor. It appears that a restoration of flow through the system will be required to

PROJECT OK-2-322-M
SUNNYHILL WETLAND RESTORATION

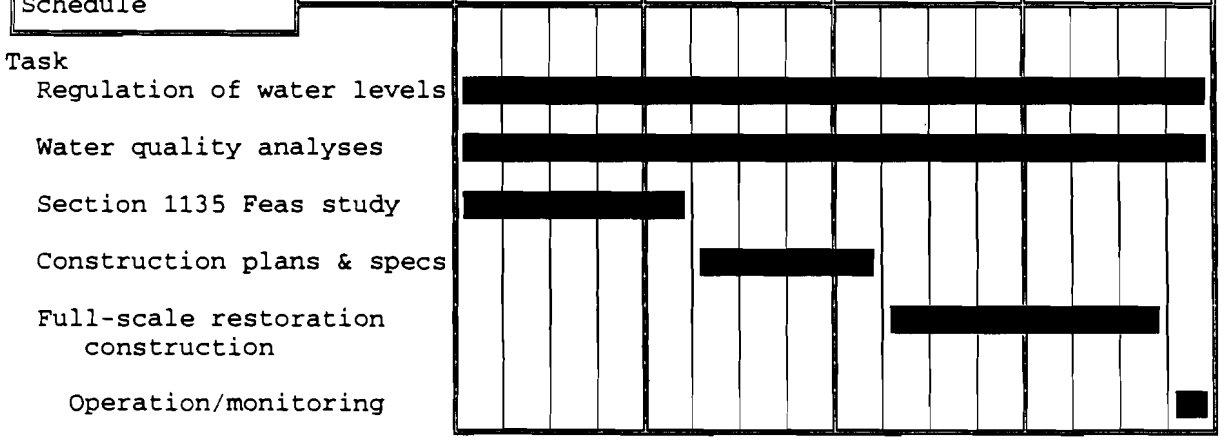
significantly improve water quality. Phase I restoration construction was conducted in 1992, including clearance of woody vegetation from about six miles of the old river channel. A conceptual full-scale restoration plan and hydrological modeling have been completed. A cooperative study with U.S. Army Corps of Engineers to determine the feasibility of obtaining Federal funding for the full-scale restoration through Section 1135 of the Water Resources Development Act was completed in January 1995. A decision on Federal funding for the project is pending review of the feasibility study final report.

Report: United States Army Corps of Engineers. 1995 Section 1135 Project modification report and environmental assessment. Ocklawaha River, Florida. Department of the Army, Corps of Engineers, Jacksonville District, Jacksonville, FL.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$110,740	$150,000	$175,000	$200,000
District Overhead	$22,148	$30,000	$15,000	$40,000
Expenses				
Travel	$300	$1,000	$1,500	
Supplies	$6,100	$8,000	$30,000	$10,000
Miscellaneous	$1,000	$1,000	$1,000	$1,000
Contracted Services		$4,500		$200,000
ACOE Construction*			$3,000,000	
Equipment	$15,000	$46,250		$100,000
Other:				
Chemical Analyses	No charge	to SWIM		
SWIM Total	$155,288	$240,750	$222,500	$551,000

Schedule



* Contingent on Federal approval of Section 1135 restoration project.

PROJECT OK-2-323-M
LAKE GRIFFIN MARSH FLOW-WAY

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, and Other Fish and Wildlife Habitat; Excessive Nutrient Levels

PROJECT OBJECTIVES: To restore muck farm land to wetland in order to filter nutrient-rich water from Lake Griffin and to reestablish fish and wildlife habitat. Nutrients and suspended sediments will be removed from Lake Griffin water as it is circulated through the created wetland. Water returned to the lake will be better quality.

JUSTIFICATION/RATIONALE: This sub-project will address three SWIM Act concerns: 1) Destruction/restoration of natural systems. Up to 2,000 acres of former muck farm will be converted to aquatic habitat. 2) Correction and prevention of surface water problems. Equilibrium total nutrient concentrations in Lake Griffin surface water will be reduced by operation of the wetland treatment system. 3) Point and nonpoint pollution sources. Historic pollutant loading from the former agricultural operations will be eliminated.

SCOPE OF WORK: Phase I - Attempt to utilize existing intake culverts and discharge pumps to flood farms and sheet flow water through the project. Develop interim design for necessary changes to inflow and outflow structures. Monitor success of sheet flow and nutrient removal across project. Phase II- Design project to provide necessary hydraulic loading and sheet flow for target nutrient removal. Complete internal construction and inflow/outflow facilities as required. Monitor hydraulics and nutrient removal efficiency within project area, and effects on Lake Griffin equilibrium nutrient concentrations.

STATUS: Topographic information has been developed and contours mapped for the farms designated as flow-ways. Flooding began on the former S.N. Knight (South) Farm, the primary flow-way project location, in July 1994. The existing pumps have been reconditioned and fitted with electric motors driven by 3 phase current delivered 2.2 miles to the pump sites. Existing inflow/outflow structures were found to be inadequate for meaningful pilot testing. Permits have been obtained from FDEP, ACOE, and the Division of State Lands for the construction of new intake structures. Pilot operations were begun in October 1994 for Phase I of the marsh flow-way project on this S.N. Knight property. The second area of the marsh flow-way sites is the former Lowrie Brown Farm. This property was flooded in 1992 and its waters currently fluctuate with Lake Griffin's stage but with no significant interchange. A preliminary

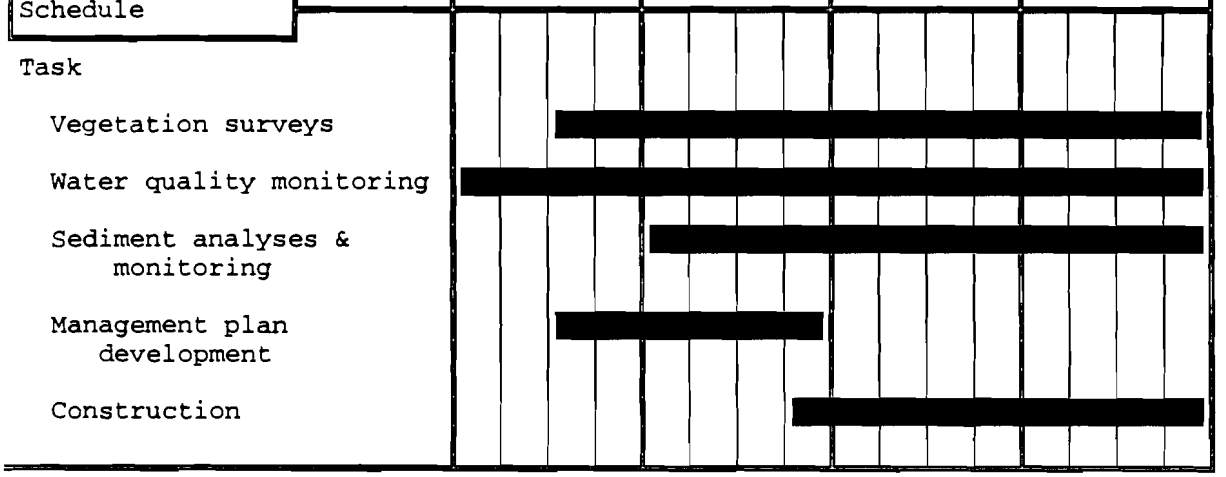
PROJECT OK-2-323-M
LAKE GRIFFIN MARSH FLOW-WAY

design for the pilot flow-way for this farm has been completed. Some levee maintenance is ongoing on both properties. Monitoring of water quality and vegetation for both properties has been implemented.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$84,800	$150,000	$200,000	$200,000
District Overhead	$16,960	$30,000	$40,000	$40,000
Expenses		$20,000	$40,000	$75,000
Travel	$300			
Supplies	$6,600			
Miscellaneous	$1,000			
Contracted Services		$152,500	$200,000	$1,800,000
Equipment	$18,000	$56,000	$100,000	$200,000
Total	$127,660	$408,500	$580,000	$2,315,000

Schedule



PROJECT OK-2-324-M
EMERALDA MARSH CONSERVATION AREA RESTORATION

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat; Excessive Nutrient Levels

PROJECT OBJECTIVES: The District has acquired a number of muck farm properties in the UORB through the Save Our Rivers and Preservation 2000 programs. Acquired properties include the Lisbon properties of S.N. Knight and Sons, Walker Ranch, Lowrie Brown Farm, Matthews Farm, Long Farm, Eustis Muck Farm, and Ashley Farm. The Leesburg property of S.N. Knight and Sons also was purchased. The primary management goal for these properties is to restore the hydrologic and ecological functions of the historic Ocklawaha River floodplain, which includes these properties. Objectives are to develop and implement restoration plans for improvement of fish and wildlife habitat, improvement of water quality in the Ocklawaha River basin through cessation of agricultural discharges and nutrient uptake by the floodplain-wetland system, and creation of recreational opportunities for the public. Restoration plans will recommend a course for active or passive management of the properties.

JUSTIFICATION/RATIONALE: These restorations will address three of the SWIM Act concerns: 1) Destruction/restoration of natural systems. Thousands of acres of former muck farm will be converted to aquatic habitat. 2) Correction and prevention of surface water problems. Conversion of the former agricultural area to aquatic habitat will reduce pollutant loading to adjacent water bodies in the basin. 3) Point and nonpoint pollution sources.

SCOPE OF WORK: Cessation of agricultural operations on acquired properties. Detailed surveys of topography, vegetation, and water quality. Development and implementation of restoration plans. Contaminant testing of fish stocks.

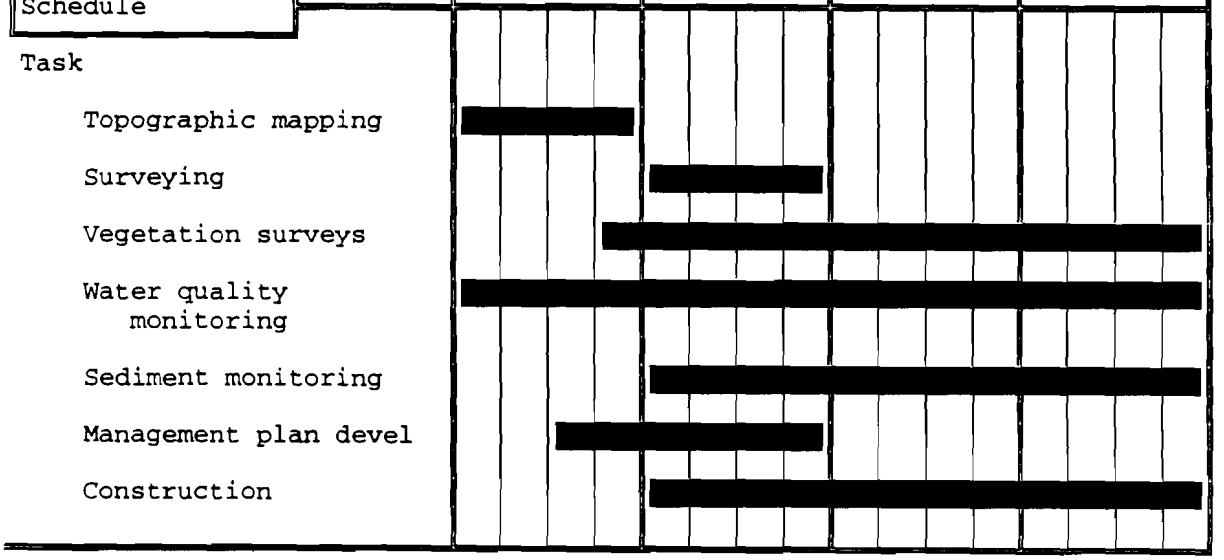
STATUS: All farms in the Emeralda area have been acquired by the District with the exception of Getford Farm. Pumps have been removed from most of the farms and former agricultural discharges have been eliminated on all of the properties. Contamination sites on the farms have been identified and remediation completed. S. N. Knight North Farm, Long Farm, and Lowrie Brown Farm were flooded in 1992. The S.N. Knight Leesburg Farm was partially flooded in 1993. All of the flooded farms have been stocked with gamefish by the Florida Game and Fresh Water Fish Commission. Farm

topography has been documented through aerial photogrammetry and one foot contour maps have been developed for most of the properties. Monitoring of vegetation and water quality was implemented on flooded farms in 1993. A draft long-term restoration plan for the properties is in preparation.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$62,100	$100,000	$120,000	$150,000
District Overhead	$12,420	$20,000	$24,000	$30,000
Expenses		$30,000	$40,000	$50,000
Travel	$300			
Supplies	$1,100			
Miscellaneous	$500			
Contracted Services		$137,500	$250,000	$500,000
Equipment	$15,000		$50,000	$50,000
Total	$91,420	$287,500	$484,000	$780,000

Schedule



PROJECT OK-2-325-M
OCKLAWAHA PRAIRIE WETLAND RESTORATION

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat; Excessive Nutrient Levels

PROJECT OBJECTIVES: To re-establish, to the extent practicable, the riparian wetland ecosystem and related components of the historic Ocklawaha River at Ocklawaha Farms, a 2,500 acre muck farm acquired by the District in 1991. This includes restoration of hydrologic conditions in the historic river channel and associated wetlands, and re-establishment of natural vegetative communities to improve habitat value of the wetlands area for fish and wildlife. To improve water quality in the Ocklawaha River through nutrient uptake by the floodplain-wetland system. To provide recreational oppportunities on the restored lands.

JUSTIFICATION/RATIONALE: This river channel and floodplain wetland restoration will address three of the SWIM Act concerns: 1) Destruction/ restoration of natural systems. Approximately 2500 acres of former muck farm will be converted to wetland habitat. 2) Correction and prevention of surface water problems. Conversion of the former muck farm area to marsh will reduce pollutant inputs from the farm and surrounding uplands to the Ocklawaha River. 3) Point and nonpoint pollution sources. Uptake of riverborne dissolved nutrients and suspended sediments by the wetland system is expected to improve water quality in the Ocklawaha River downstream of the restoration area. The wetland will also utilize nonpoint source pollutants entering the system from surrounding uplands.

SCOPE OF WORK: Surveying of the river channel and floodplain wetlands and hydrological modeling to develop plans for restoration of hydrological functions of the riparian wetland system. Remove most interior drainage structures on the property, creating a low maintenance floodplain. Construction of water control structures to divert a portion of the flow in the Ocklawaha Canal through the historic river channel and floodplain and to improve capabilities for regulation of water flow through the floodplain-wetland system. Interim management of water levels to promote wetlands development in the former agricultural fields. Re-vegetate wetland areas primarily by natural germination, supplemented where necessary by planting or seeding of hardwood and herbaceous species. Development of plans for restoration and management of wetland vegetation communities.

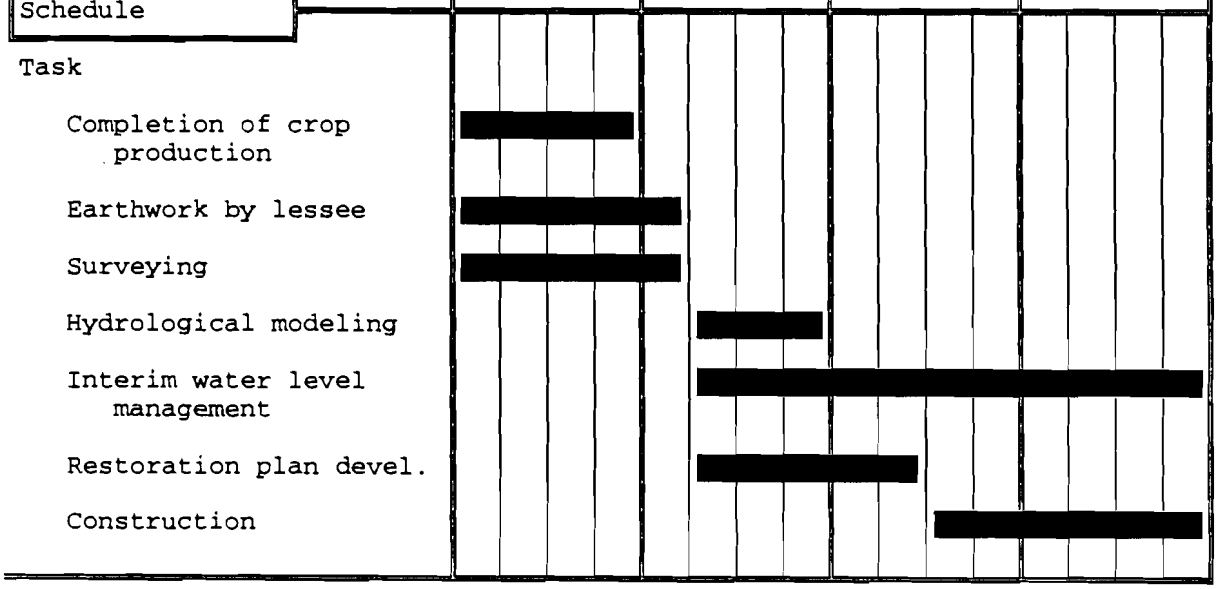
PROJECT OK-325-M
OCKLAWAHA PRAIRIE WETLAND RESTORATION

STATUS: Part of the muck farm area was leased back to the farmer through 1994. Agricultural activity has now ceased, but the farmer is still completing tasks specified in the lease agreement. As a part of the lease agreement, the farmer is performing initial earthwork, including grading levees along six miles of the old river channel to approximate field elevation, removing woody vegetation and muck accumulations from the old river channel, and plugging or backfilling farm ditches and canals. Surveying of the old river channel and floodplain areas was contracted in 1993-94. We expect to seek federal funding for the restoration through the Section 1135 Program authorized by the Water Resources Development Act.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$26,800	$50,000	$80,000	$100,000
District Overhead	$5,360	$10,000	$16,000	$20,000
Expenses				
Travel		$500	$1,000	$1,500
Supplies	$200	$5,000	$6,000	$8,000
Miscellaneous	$500	$1,000	$1,000	$1,000
Contracted Services	$90,000	$13,500	$200,000	$2,000,000
Equipment		$18,000		
Total	$122,860	$98,000	$304,000	$2,130,500

Schedule



PROJECT OK-4-331-D
WETLAND MAPPING OF THE UORB

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat.

PROJECT OBJECTIVES: Mapping of the wetland communities within Lake County is under contract through a cooperative program between the District and the Lake County Water Authority. The proposed project would complete mapping of emergent wetland plant communities of the UORB outside of Lake County. In addition, the historical conditions within the basin will be mapped using the oldest aerial photography available.

JUSTIFICATION/RATIONALE: This project will address two of the SWIM Act concerns: 1) Destruction/restoration of natural systems - the information will be used to document historical impacts to wetlands, identify wetlands for protection and restoration, and facilitate planning of wetland restoration projects. 2) Interagency coordination in management - the information will be available for development of local government Comprehensive Plans.

SCOPE OF WORK: Complete mapping of existing wetland in the UORB in Marion and Orange Counties from 1986 aerial photos. Interpretation, delineation, and classification of wetlands; production of 1/24,000 scale maps; reproduction, distribution and updating of maps. Acquire historical photography, map and analyze for trends in wetland loss.

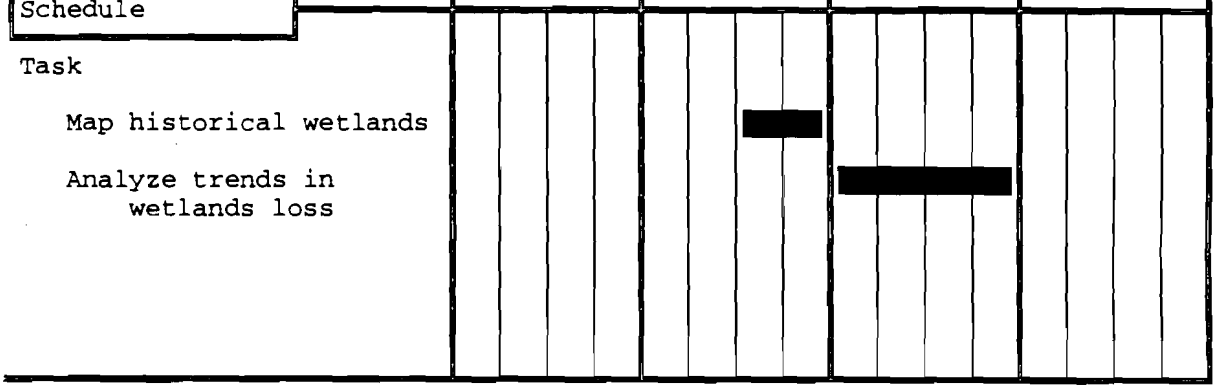
STATUS: Delineation, interpretation, and digitization wetlands habitat from 1986 aerial photography has been completed.

PROJECT OK-4-331-D
WETLAND MAPPING OF THE UORB

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits		$13,000	$7,000	
District Overhead		$2,600	$1,400	
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services		$10,000		
Equipment				
Total		$25,600	$8,400	

Schedule



PROJECT OK-4-332-D
INVENTORY OF SPECIAL SPECIES AND UNIQUE OR ENDANGERED HABITATS

PRIORITY: 2

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats.

PROJECT OBJECTIVES: The purpose of this project is to locate rare and endangered species, and unique or endangered habitats (both wetland and upland) occurring in the UORB.

JUSTIFICATION/RATIONALE: This project primarily addresses the SWIM Act concern of Destruction/restoration of natural systems; the information obtained will be used to develop protection strategies for endangered species and habitats. The information will also assist local governments in their development and implementation of Comprehensive Plans and regulatory ordinances.

SCOPE OF WORK: Compile existing data from the Florida Natural Areas Inventory (FNAI), District wetlands mapping and land use mapping projects, Florida Game and Fresh Water Fish Commission studies, local government information, area biologists, and other sources to identify known and potential unique or endangered species/habitats, and potential threats due to trends in land use. Conduct biological surveys as necessary to inventory unknown areas and verify previously obtained information. These surveys will include inventories of vegetation, avifauna, and other wildlife, with special attention being given to rare or endangered species.

STATUS: An identification of regionally significant habitats is being completed as part of the ecosystem protection section of the District Water Management Plan. This project is based on a statewide habitat assessment completed by the Florida Game and Fresh Water Fish Commission for 44 focal species and plant communities. Habitat conservation areas and biodiversity hot spots identified in the GFC study are being overlaid on the District's land use/cover data base.

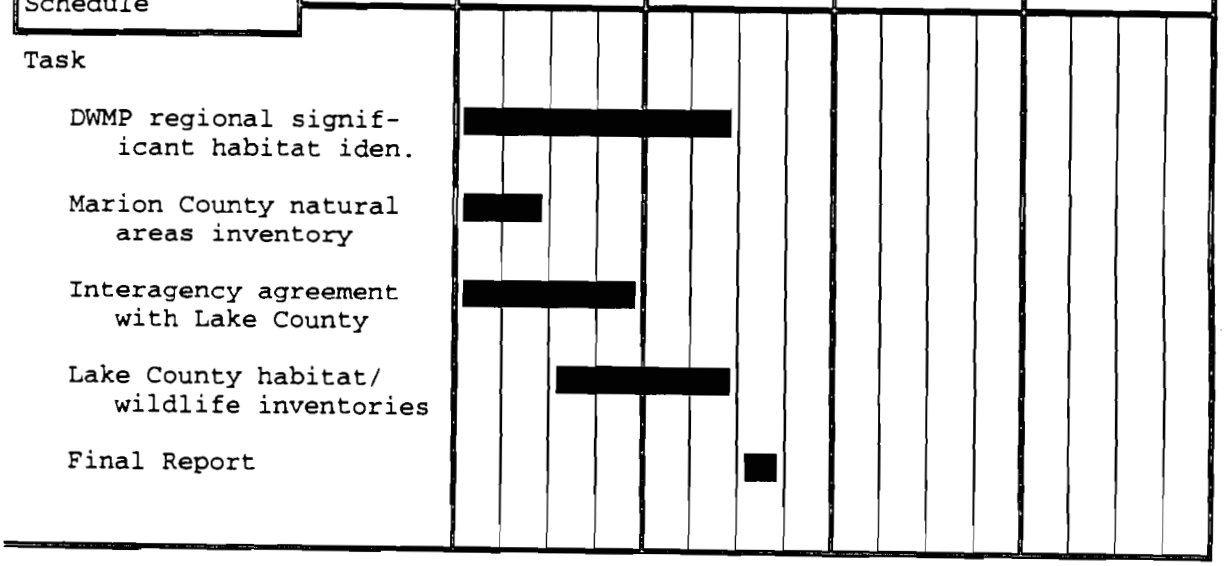
A natural areas inventory of Marion County was completed by FNAI in 1993, funded jointly by Marion County, SJRWMD, SWFWMD, and the Nature Conservancy. The District entered into an interagency agreement with Lake County Water Authority, and Lake County Board of County Commissioners to fund a contract with FNAI to conduct surveys of natural areas of state and local significance, develop a systematic inventory and database of natural ecological communities, and gather information on rare and endangered species in Lake County.

PROJECT OK-4-332-D
INVENTORY OF SPECIAL SPECIES AND UNIQUE OR ENDANGERED HABITATS

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$0	$0	$0	$0
District Overhead				
Expenses				
Travel				
Supplies				
Miscellaneous				
Non-SWIM Contracts	$10,000			
Equipment				
Total	$0 (No cost to SWIM)	$0	$0	$0

Schedule



PROJECT OK-4-351-D
PHOTOGRAMMETRIC TOPOGRAPHIC MAPPING

PRIORITY: 2

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats; Excessive Nutrient Levels

PROJECT OBJECTIVES: To complete aerial contour mapping of the UORB at one foot contour intervals.

RATIONALE/JUSTIFICATION: This project addresses three of the SWIM Act concerns: 1) Destruction/restoration of natural systems, 2) Correction and prevention of surface water problems, and 3) Research for better management. This project will provide essential information for evaluating the feasibility of restoring normal seasonal surface water fluctuations for habitat restoration and improvements in water quality. The data will be used in the development of basin hydrologic simulation models (see UORB Floodplain Study), assessing flood profiles, and environmental evaluations during the planning phase of floodplain restoration projects.

SCOPE OF WORK: Aerial contour mapping at one foot contour intervals.

STATUS: The major portion of the basin has been completed except for 17 sections in the Howey-in-the Hills and Eustis quads. These sections will be completed during 1995 under a non-SWIM funded cooperative project with Lake County.

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PROJECT OK-4-352-F
UORB FLOODPLAIN STUDY

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats; Excessive Nutrient Levels

PROJECT OBJECTIVES: A surface water investigation to develop a model of the watershed's current hydrologic and hydraulic characteristics that can be used to evaluate water surface elevations and impacts resulting from alternative water management strategies. This information will be used to develop BMPs for water management in the tributary basins.

JUSTIFICATION/RATIONALE: This project addresses three of the SWIM Act concerns: 1) Destruction/restoration of natural systems, 2) Correction and prevention of surface water problems, and 3) Research for better management. Restoration of natural seasonal fluctuations in water levels or periodic drawdowns are potential methods to restore desirable wetland and submersed vegetation habitats, and potentially contribute to improved water quality in the UORB. Results of this study will aid in ranking alternative water management strategies for the correction and prevention of surface water problems.

SCOPE OF WORK: This surface water investigation will quantify and model river flows and stages in the tributary basins for existing conditions. The model as presently structured can model the basin from Lake Apopka down to Connor on the Ocklawaha River. Alternative water management strategies (including drawdowns and enhanced fluctuation schedules) will be developed and assessed to quantify their impact on the riverine system. Monitoring of flows and stages at the two ends of the Dead River connecting Lakes Harris and Eustis will be required to refine the hydrological model to develop estimates of flow between the two lakes. The model developed will be used to evaluate drawdown and enhanced fluctuation schedules, and to refine the external nutrient budget for the basin by providing estimates of water exchange. The results of these analyses will be combined with methodologies developed by the Socioeconomic Basin Engineering Study to assess socioeconomic and ecological effects of alternative water regulation schedules for the lakes and river.

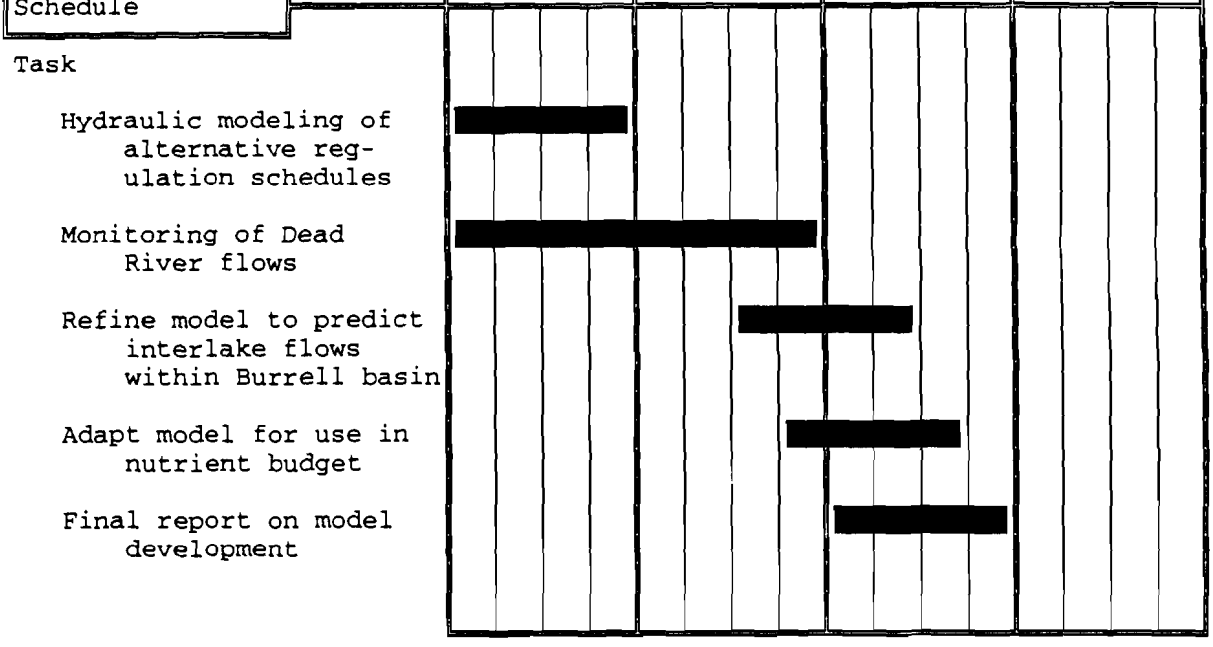
STATUS: A report on Phase 1 of the hydrological modeling is under review. The model has been used to develop alternative regulation schedules for the Ocklawaha Chain-of-Lakes. The District has contracted with USGS for monitoring of flows in the Dead River.

PROJECT OK-4-352-F
UORB FLOODPLAIN STUDY

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$13,100	$15,000	$20,000	
District Overhead	$2,620	$3,000	$4,000	
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services				
Equipment				
Total	$15,720	$18,000	$24,000	$0

Schedule



PROJECT OK-4-353-F
SOCIOECONOMIC BASIN ENGINEERING STUDY

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats; Excessive Nutrient Levels

PROJECT OBJECTIVES: Develop a methodology to assess and quantify economic impacts of alternative water management strategies (including drawdowns and enhanced fluctuation schedules). Apply methodology to assess economic consequences resulting from alternative operation schedules.

JUSTIFICATION/RATIONALE: This project addresses three of the SWIM Act concerns: 1) Destruction/restoration of natural systems, 2) Correction of surface water problems, and 3) Research for better management. Virtually all of the flow in the UORB is regulated by water control structures. These structures have diminished the natural periodic fluctuation in lake stages and altered stream discharges. Potential strategies for increasing habitat diversity and improving water quality include drawdowns and restoration of natural seasonal water level fluctuations in the UORB. The Ocklawaha Chain-of-Lakes are heavily used for recreation and navigation, and there has been substantial development of the floodplains. The economic impacts of changing water regulation schedules need to be evaluated.

SCOPE OF WORK: Contracted study to develop a methodology to quantify socioeconomic costs and benefits and flood damage potential using monetary indices and complete assessessment of existing conditions in the basin. District staff will develop supplementary methods to quantify impacts of lake level fluctuations for 1) flooding of residential and commercial structures within the 100 year floodplain, 2) groundwater saturation of septic tank systems within the 100 year floodplain, 3) inaccessibility to lakeside and canal docks, 4) failure of lakeside and canal seawalls, and 4) potential reduction of frost/freeze protection to agricultural activity adjacent to UORB lakes and levee overtopping. Apply the methods to assess economic consequences resulting from alternative regulation schedules for the Ocklawaha Chain-of-Lakes (see Lake Fluctuation Schedule Revision).

STATUS: The contracted study is complete. A draft report on development and application of supplementary methods for economic impacts analysis is in review. The economic impacts methods have been applied for a preliminary assessment of proposed alternative regulation schedules for the Ocklawaha Chain-of-Lakes.

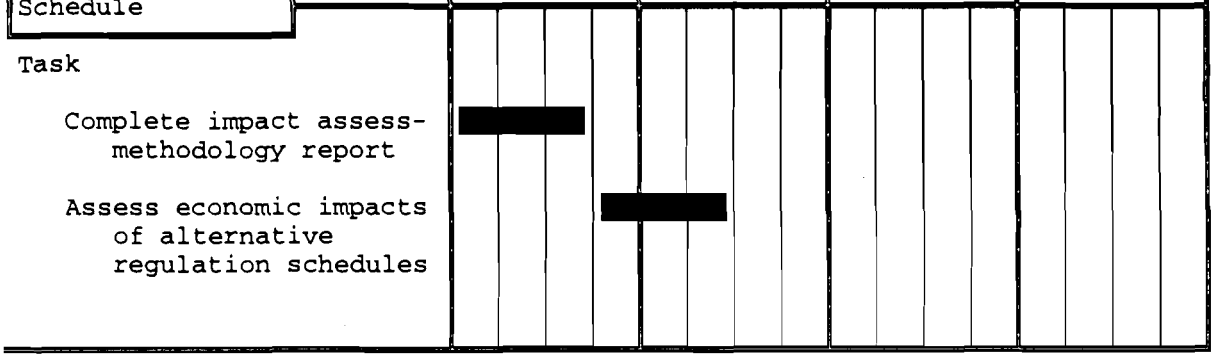
PROJECT OK-4-353-F
SOCIOECONOMIC BASIN ENGINEERING STUDY

Report:
Heaney, J.P., S. Kenner, C. Cosio, and M. Fowler. 1991. General methodology for evaluating the socio-economic impacts associated with water resources projects. Report to St. Johns River Water Management District.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$52,500	$9,000		
District Overhead	$10,500	$1,800		
Expenses				
Travel	$200			
Supplies	$1,500			
Miscellaneous	$200			
Contracted Services				
Equipment				
Total	$64,900	$10,800		

Schedule



PROJECT OK-2-354-M
LAKE FLUCTUATION SCHEDULE REVISION

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats; Excessive Nutrient Levels

PROJECT OBJECTIVES: Develop and implement new fluctuation schedules for the Ocklawaha Chain-of-Lakes for environmental and economic benefits.

JUSTIFICATION/RATIONALE: This project addresses three of the SWIM Act concerns: 1) Destruction/restoration of natural systems, 2) Correction of surface water problems, and 3) Research for better management. Virtually all of the flow in the UORB is regulated by water control structures. These structures have diminished the natural periodic fluctuation in lake stages and altered stream discharges. One potential strategy for increasing habitat diversity and improving water quality is restoration of natural seasonal water level fluctuations in the UORB. Restoring natural seasonal water level fluctuations may promote establishment of beneficial wetland and submersed vegetation, aid in consolidation of sediments, reduce sediment resuspension and nutrient regeneration, improve habitat for fish and wildlife, and provide a more beneficial distribution of flows in the Ocklawaha River. It is not clear if restoring natural fluctuations will be sufficient to restore a system degraded by long periods of stabilized water levels. More extreme drawdowns are not expected to be incorporated in the proposed long-term fluctuation schedules, but will continue to be considered on a case-by-case basis as the need arises.

SCOPE OF WORK: Develop criteria for environmentally desirable fluctuation schedules from surveys of riparian wetland vegetation distribution, records of historic water level fluctuations, and information on habitat requirements of biota. Use hydraulic model of basin (see UORB Floodplain study) to develop regulation schedules meeting fluctuation criteria. Following development of alternative water regulation schedules, District staff will apply the socioeconomic assessment methodology to assess economic consequences resulting from alternative operation schedules, rank alternative schedules, and pursue implementation of the best management plans. Develop plans for alleviating problems in lake access resulting from wider fluctuation ranges.

STATUS: Surveys of wetland vegetation distribution were completed to develop criteria for fluctuation ranges that protect and enhance wetlands habitat. The basin hydraulic model was used to develop alternative regulation schedules, and socioeconomic impacts

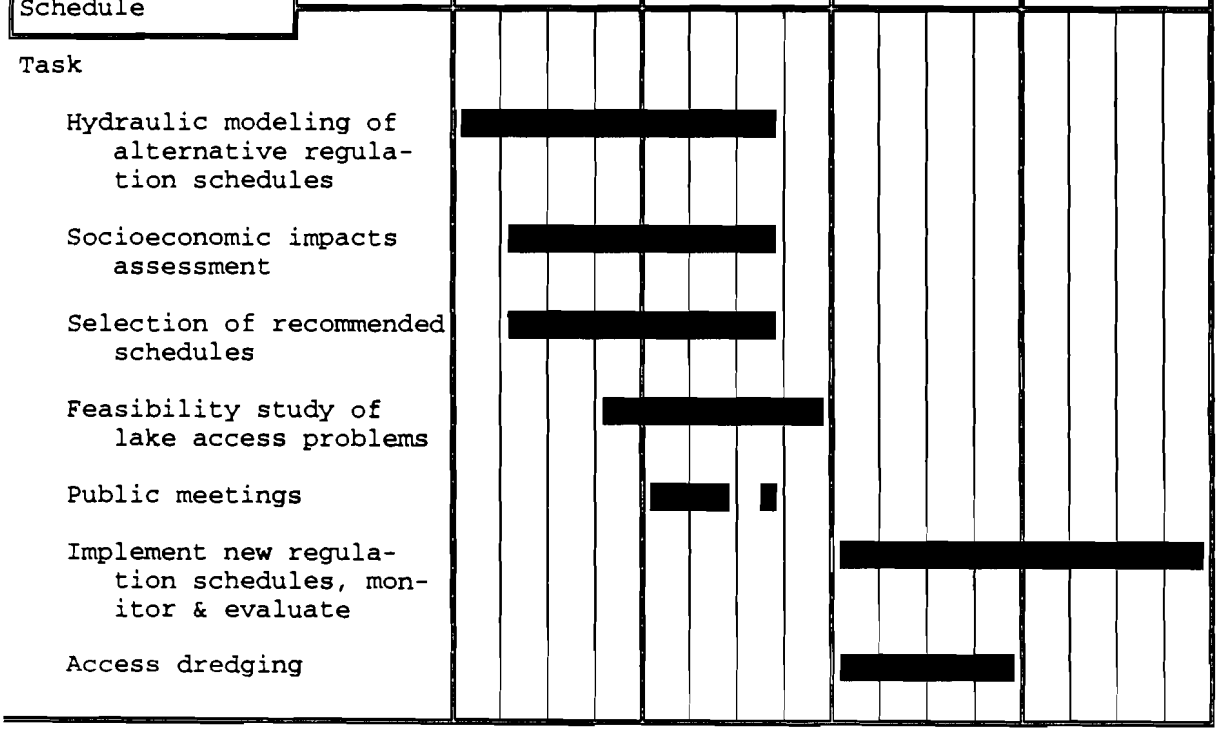
PROJECT OK-2-354-M
LAKE FLUCTUATION SCHEDULE REVISION

of proposed schedules have been evaluated. The UORB Technical Advisory Group has reviewed and supported the proposed schedules. A series of public meetings were conducted in November - December 1994 to discuss the proposed schedules. In response to concerns expressed at the public meetings, alternative schedules are presently being developed to reduce economic impacts while still retaining some of the environmental benefits.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$74,700	$75,000	$25,000	$10,000
District Overhead	$14,940	$15,000	$5,000	$2,000
Expenses				
Travel	$200	$400	$200	$200
Supplies	$100	$500	$200	$100
Miscellaneous				
Contracted Services		$50,000	$250,000	
Equipment				
Total	$89,940	$140,900	$280,400	$12,300

Schedule



PROJECT OK-2-361-M
LAKE DENHAM BIOMANIPULATION

PRIORITY: 1

ISSUE CATEGORIES: Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat; Excessive Nutrient Levels

PROJECT OBJECTIVES: To lower trophic state and/or change trophic structure in Lake Denham through removal of planktivorous fish. Previous work in the Lake Apopka program demonstrated that trophic state could be improved for this lake by large-scale removal of gizzard shad.

JUSTIFICATION/RATIONALE: This sub-project will address two SWIM Act concerns: 1) Destruction of natural systems. Lake Denham has been altered through cultural eutrophication. Biomanipulation will be conducted on the lake to improve water quality and food-web conditions. 2) Correction and prevention of surface water problems. Lowered trophic state for this lake will provide for greater use by the general public.

SCOPE OF WORK: Install permanent fish barrier in Helena Run downstream of Lake Denham to prevent entry of planktivorous fish from Lake Harris. Remove 80 percent of adult planktivorous fish stock from lake by haul seine and/or pound net. Monitor fish removal to document fish stock depletion.

STATUS: The initial biomanipulation for Lake Denham was completed under the Trophic Structure Manipulation Project in the Lake Apopka SWIM Program. Water quality (clarity, nutrient status) was significantly improved following the fish removal. Phytoplankton biomass declined significantly and there was a significant change in both zooplankton biomass and species composition. The experimental fish barrier preventing planktivorous fish entry into Lake Denham has deteriorated and gizzard shad have reentered the lake. Water quality variables have shown a decline since removal of the fish-exclusion barrier from the lake; however the declining trend is not yet significant.

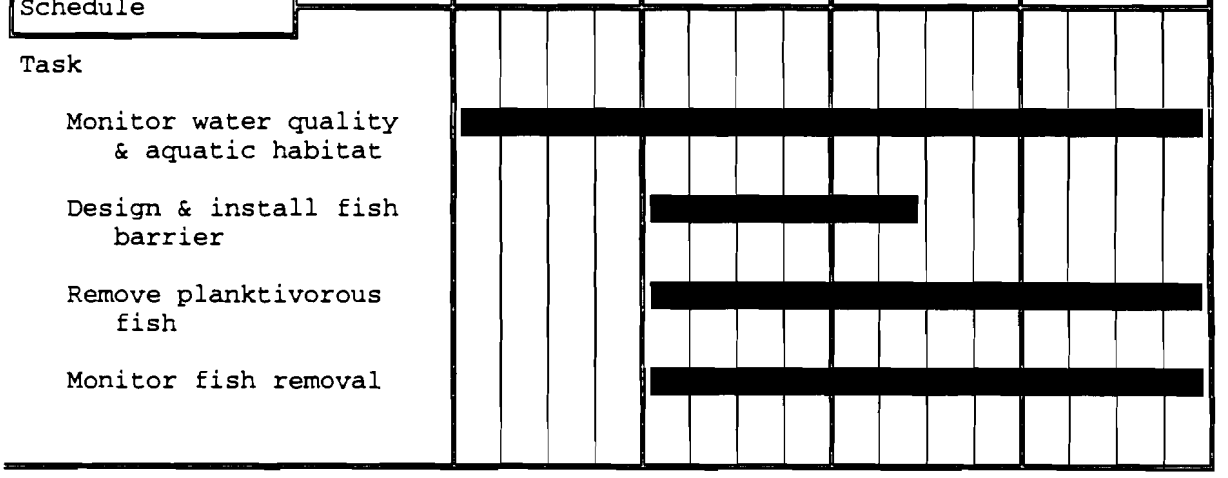
Report:
Godwin, W.F., S.G Coyne, and E.A. Gisondi. 1993. An evaluation of methods for removal of rough fish as a restoration technique for Lake Apopka. Department of Surface Water Programs, Tech. Mem. No. 3, St. Johns River Water Management District, Palatka, FL.

PROJECT OK-2-361-M
LAKE DENHAM BIOMANIPULATION

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$11,100	$10,000	$12,000	$14,000
District Overhead	$2,220	$2,000	$2,400	$2,800
Expenses				
Travel	$200	$1,000	$1,000	$1,000
Supplies	$100	$3,000	$3,000	$3,000
Miscellaneous		$1,000	$1,000	$1,000
Contracted Services		$35,000	$35,000	$35,000
Equipment		$5,000	$2,000	$1,000
Total	$13,620	$57,000	$56,400	$57,800

Schedule



PROJECT OK-5-421-M
LOCAL GOVERNMENT AND SPECIAL INTEREST GROUP INFORMATION AND PARTICIPATION IN SWIM

PRIORITY: 1

ISSUE CATEGORIES: Interagency Coordination; Public Awareness and Participation

PROJECT OBJECTIVES: To provide regular updates on the SWIM program, District staff will make formal presentations to the Planning Commissions and Boards of County and City Commissioners in Lake and Marion Counties. Presentations will also be made to municipalities and special interest groups within the UORB. District staff will conduct yearly workshops with local governments and the public to encourage participation in revision/development of the SWIM plan.

JUSTIFICATION/RATIONALE: This project addresses two of the SWIM Act concerns: 1) Public awareness and education - by communicating the value of the SWIM program to local government officials, citizen groups, and the general public. 2) Improved coordination and management - by promoting integration between the SWIM program and environmental protection programs administered by local governments.

SCOPE OF WORK: Coordination with the Department of Planning and Acquisition to arrange presentations, organize public workshops/forums, provide SWIM and District materials, conduct tours of SWIM restoration projects.

STATUS: A series of public forums, workshops and meetings have been conducted with local governments, interest groups and the general public.

PROJECT OK-5-421-M
LOCAL GOVERNMENT AND SPECIAL INTEREST GROUP INFORMATION AND PARTICIPATION IN SWIM

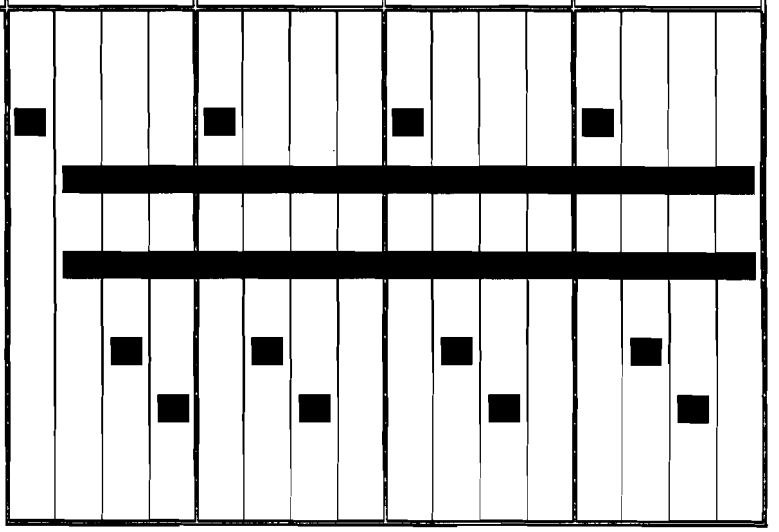
Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$4,640	$5,000	$5,000	$5,000
District Overhead	$928	$1,000	$1,000	$1,000
Expenses				
Travel				
Supplies	$200	$500	$500	$500
Miscellaneous				
Contracted Services				
Equipment				
Total	$5,768	$6,500	$6,500	$6,500

Schedule

Task

- Update slide programs
- Local government presentations
- Citizen's group presentations
- Local govt workshops
- Public workshops



PROJECT OK-5-422-M
LOCAL GOVERNMENT COMPREHENSIVE PLAN REVIEW

PRIORITY: 1

ISSUE CATEGORIES: Interagency Coordination; Excessive Nutrients; Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitats

PROJECT OBJECTIVES: As part of the District's local government assistance program through the Division of Policy and Planning, assist in the preparation and implementation of Comprehensive Plans, and take part in the formal review process of submitted Comprehensive Plans.

JUSTIFICATION/RATIONALE: This project will primarily address the SWIM Act concern of Interagency coordination in management- promoting the inclusion of SWIM issues into local Comprehensive Plans, Local Development Regulations, and local ordinances. This project will also address the SWIM Act concerns of Point and nonpoint pollution sources, and Destruction/restoration of natural systems, as these are issues to be considered in Comprehensive Plans (see Table 1).

SCOPE OF WORK: Assist local governments in preparation of Comprehensive Plans, plan amendments, and Local Development Regulations derived from Comprehensive Plans, and review submitted Comprehensive Plans. No SWIM funds will be required for this project, as it will be supported by other funding sources.

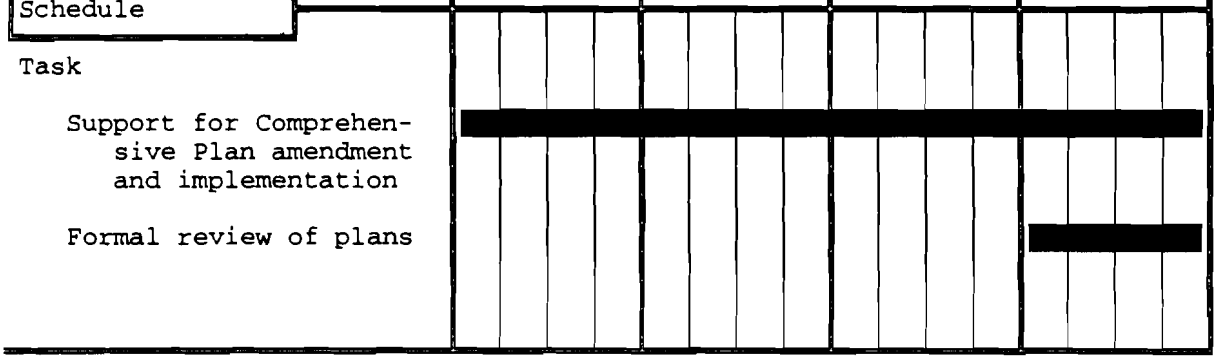
STATUS: Review of Plan amendments and assistance to local governments in implementation of Comprehensive Plans are ongoing. The District anticipates the next cycle of local government plan review will begin in fiscal year 1995-96, with most plans arriving in 1996-97.

PROJECT OK-5-422-M
LOCAL GOVERNMENT COMPREHENSIVE PLAN REVIEW

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$0	$0	$0	$0
District Overhead				
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services				
Equipment				
Total	$0 (No cost to SWIM)	$0	$0	$0

Schedule



PROJECT OK-5-423-M
LOCAL GOVERNMENT ENVIRONMENTAL PROTECTION ORDINANCE ASSISTANCE

PRIORITY: 1

ISSUE CATEGORIES: Excessive Nutrient Levels; Potential Hazardous Levels of Metals and Organic Pollutants; Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat; Interagency Coordination in Management.

PROJECT OBJECTIVES: To promote and assist development and implementation of stronger local ordinances and Local Development Regulations for environmental protection in the UORB.

RATIONALE/JUSTIFICATION: This project addresses the following SWIM Act concerns: 1) Point and nonpoint pollution sources, 2) Destruction/restoration of natural systems, 3) Correction and prevention of surface water problems, and 4) Improved coordination in management. Many activities which affect surface water quality and habitat quality are under the jurisdiction of local governments, such as stormwater management systems and land use development. Water quality within a particular area is affected by development policies in all upstream jurisdictions, so coordination among local governments to develop uniform and effective environmental protection ordinances is necessary. The Water Management District has the expertise to assist local jurisdictions in development and implementation of ordinances for pollution control and habitat protection.

SCOPE OF WORK: Provide assistance to local governments in the design and implementation of stronger local ordinances and Local Development Regulations for stormwater management, land use development, and habitat protection where appropriate. A natural resource ordinance clearinghouse and two Model Fresh Water Shoreline Protection Ordinances developed by the District in collaboration with Orange and Lake Counties and the UF Center for Governmental Responsibility are centerpieces of this effort. District staff will also work with local governments to develop analogous protection measures for upland habitats.

STATUS: A natural resource ordinance clearinghouse has been established by the Division of Policy and Planning to assist local governments in development of environmental ordinances. Samples, models, and summaries of ordinances have been organized by natural resource category and are available to local governments on request. Two model shoreline protection ordinances have been created to permit local

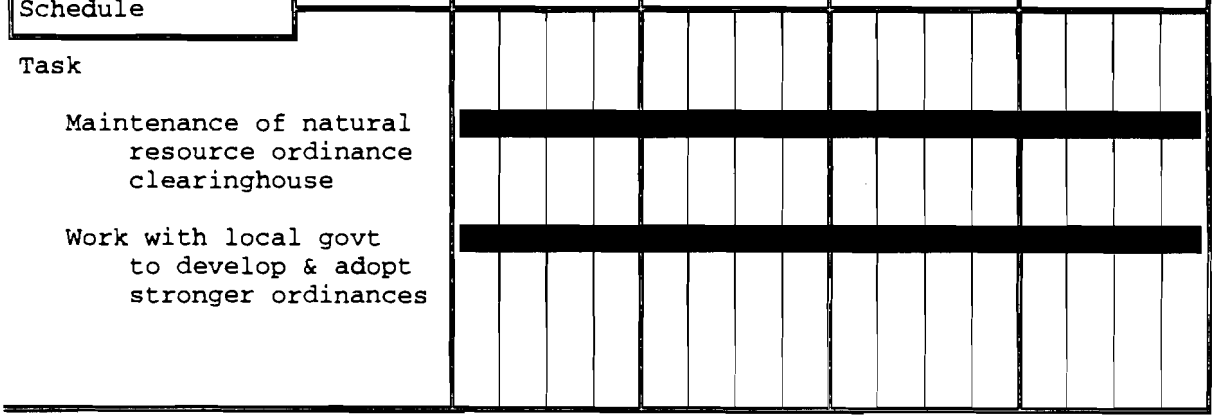
PROJECT OK-5-423-M
LOCAL GOVERNMENT ENVIRONMENTAL PROTECTION ORDINANCE ASSISTANCE

governments to exercise a broad range of regulatory applications. In regular contacts, local governments are encouraged to use the available resource materials to adopt a regulatory approach consistent with SWIM objectives.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$1,900	$2,000	$2,200	$2,400
District Overhead	$390	$400	$440	$480
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services				
Equipment				
Total	$2,290	$2,400	$2,640	$2,880

Schedule



PROJECT OK-5-424-M
DISTRICT WATER MANAGEMENT PLAN DEVELOPMENT

PRIORITY: 1

ISSUE CATEGORIES: Interagency Coordination in Management; Excessive Nutrient Levels; Potential Hazardous Levels of Metals and Organic Pollutants; Loss of Wetland, Shoreline, and Other Fish and Wildlife Habitat.

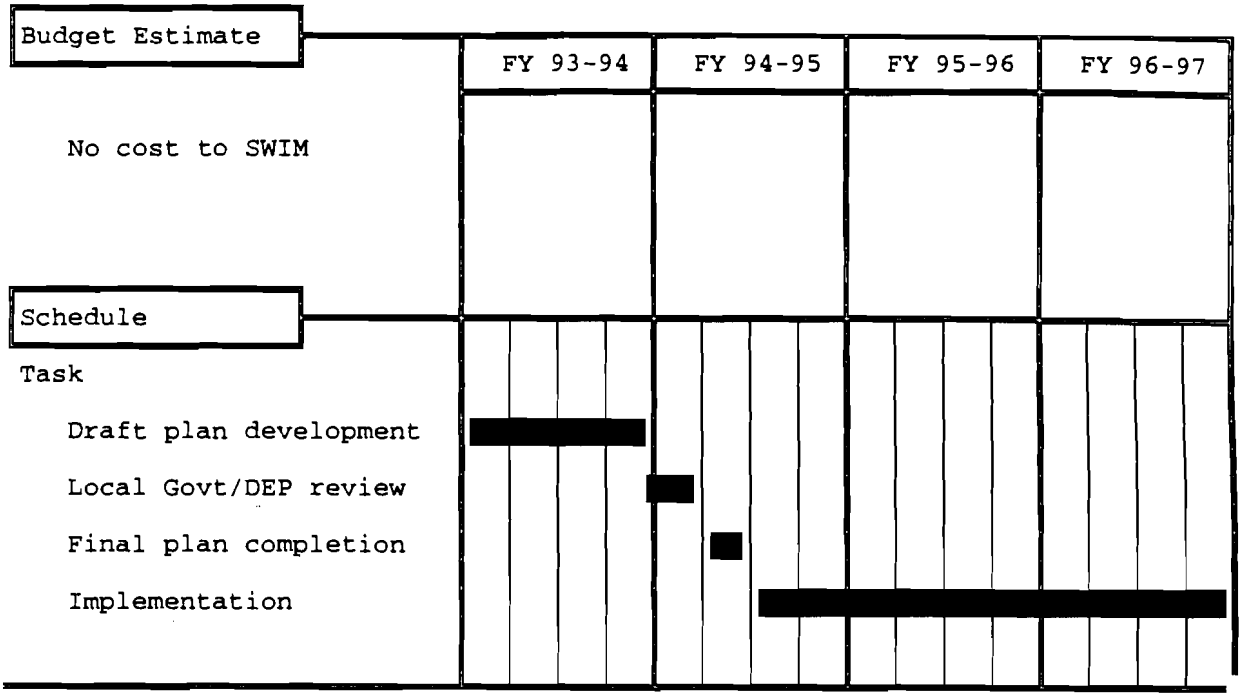
PROJECT OBJECTIVES: To develop comprehensive plans providing long-range guidance for the protection of water and related natural resources.

RATIONALE/JUSTIFICATION: This project primarily addresses the SWIM Act concern of Interagency coordination in management. The five water management districts and FDEP are closely coordinating to develop consistent statewide plans for management of water and related natural resources. The SWIM programs will be a major source of input for surface water-related sections of the District Water Management Plan (DWMP). By incorporating information from the UORB SWIM plan, the DWMP will also address the SWIM Act concerns of Point and nonpoint pollution sources, Destruction/restoration of natural systems, and Correction and prevention of surface water problems.

SCOPE OF WORK: State Water Policy directs the water management districts to develop DWMPs by November 1994. The DWMP is an assessment and planning tool that will identify water resource problems and outline plans and programs for addressing those problems. The plan will address four principal areas of responsibility: water supply, flood protection, water quality, and natural systems. For each of these areas, District staff will work with local governments and other entities to identify existing and projected water resource problems, evaluate options, and develop implementation strategies.

STATUS: A draft DWMP was completed in September 1994, and has been distributed to local governments for review. The final plan will be presented to the Governing Board for acceptance during the first quarter of 1995.

PROJECT OK-5-424-M
DISTRICT WATER MANAGEMENT PLAN DEVELOPMENT



PROJECT OK-6-521-M
CREATION AND DISTRIBUTION OF INFORMATIONAL MATERIALS

PRIORITY: 1

ISSUE CATEGORIES: Public Awareness and Participation

PROJECT OBJECTIVES: To create specialized UORB SWIM informational brochures, posters, portable displays, kiosks, and other informational materials. To produce UORB SWIM public service announcements. Distribute informational materials at special events, presentations, workshops, forums and as requested.

JUSTIFICATION/RATIONALE: This project primarily addresses the SWIM Act concern of public awareness and education. The mass media and special events provide excellent opportunities to make contact with and educate the general public.

SCOPE OF WORK: Production of informational brochures, posters, displays, slide show and other informational materials. Use displays at special events and distribute materials. Set up informational displays in public buildings and distribute materials. Production of public service announcements for television and radio stations.

STATUS: A series of brochures and posters have been developed as follows:

	No. of Copies	Printing
Sunnyhill Farm Fact Sheet	1,000	out of print
Ocklawaha SWIM Brochure I	20,000	2nd printing
Sunnyhill Farm Article in FL Naturalists	5,000	out of print
Ocklawaha SWIM Brochure II	10,000	1st printing
Emeralda Marsh Brochure	5,000	1st printing
Wetland Book with LCWA	40,000	2nd printing
Sunnyhill/Ocklawaha Poster	2,000	1st printing
Limpkin/Ocklawaha Poster	10,000	2nd printing
Ocklawaha T-shirts	5,000	1st printing

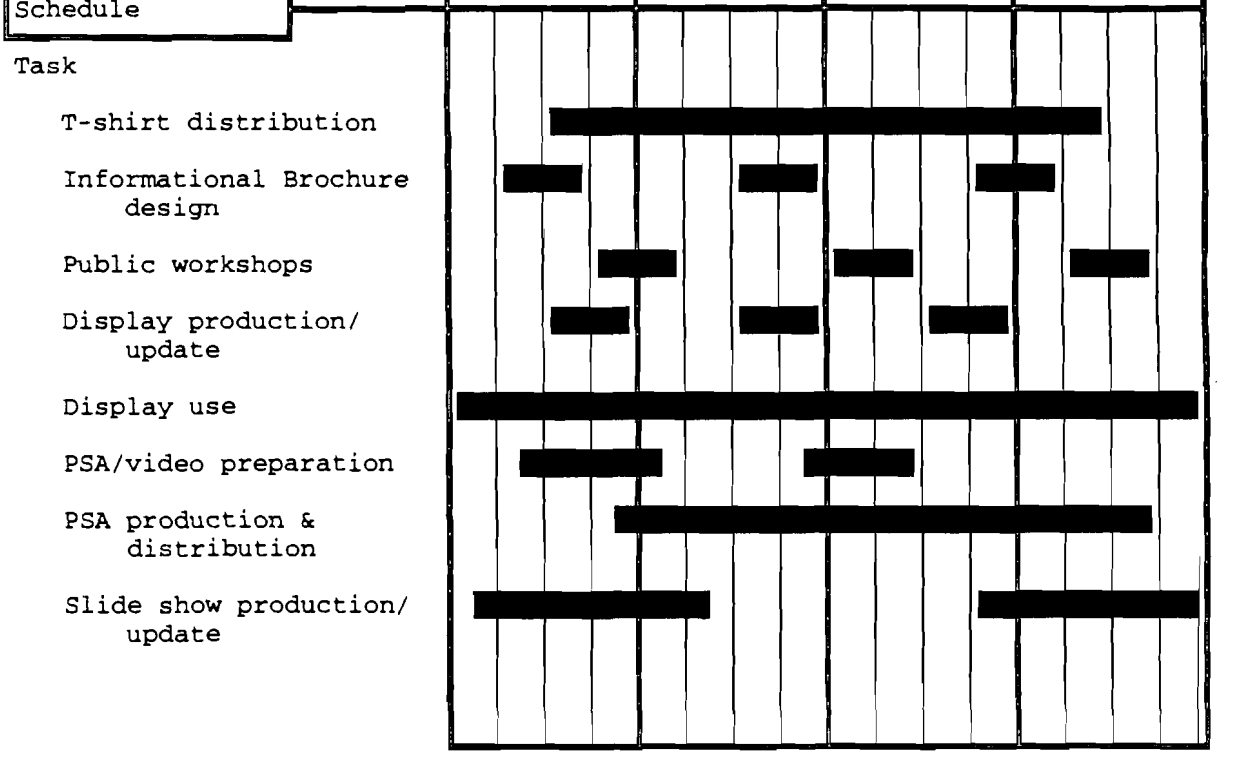
In addition, two portable displays are in regular use throughout the two county basin. Slide presentation updated as needed.

PROJECT OK-6-521-M
CREATION AND DISTRIBUTION OF INFORMATIONAL MATERIALS

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$13,000	$14,000	$15,000	$16,000
District Overhead	$2,600	$2,800	$3,000	$3,200
Expenses				
Travel				
Supplies	$1,200	$3,000	$3,000	$3,000
Miscellaneous				
Contracted Services	$10,000	$6,000	$6,000	$6,000
Equipment		$1,000	$1,000	$1,000
Total	$26,800	$27,800	$28,000	$29,200

Schedule



PROJECT OK-6-531-M
PUBLIC PARTICIPATION PROJECTS

PRIORITY: 1

ISSUE CATEGORIES: Public Awareness and Participation

PROJECT OBJECTIVES: To develop and implement programs encouraging public participation in projects centered on protection and restoration of the UORB Watershed. Projects underway and under consideration include: 1) Citizen monitoring of UORB lakes through the LakeWatch program. 2) Surveys of bird use at marsh restoration projects coordinated with birding enthusiasts in the region. 3) Litter cleanup campaigns. 4) Use citizen volunteers to lead tours of restoration sites and help distribute information.

JUSTIFICATION/RATIONALE: This project addresses the SWIM Act concern of public awareness and education by seeking public participation in SWIM restoration efforts. Secondarily, this project addresses research for better management because local citizenry can make much more frequent and synoptic observations of environmental conditions than can a limited number of professional personnel.

SCOPE OF WORK: Develop contacts with local citizen groups that may be interested in participation. Work with these groups to develop and implement public participation projects.

STATUS: A checklist of bird species using Sunnyhill Farm has been developed from numerous Audubon Society bird surveys of the property. The list is now used to monitor seasonal changes in species seen and track relative numbers of birds observed. Surveys are now beginning to expand to Emeralda Marsh region.

PROJECT OK-6-531-M
PUBLIC PARTICIPATION PROJECTS

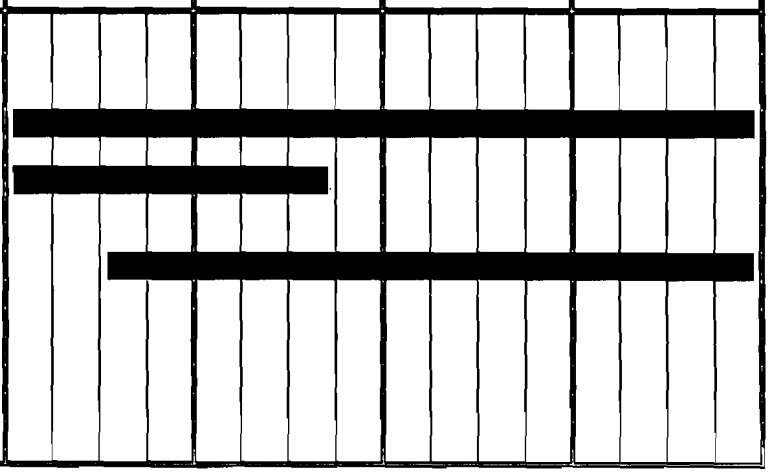
Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$5,100	$5,200	$5,200	$5,200
District Overhead	$1,020	$1,040	$1,040	$1,040
Expenses				
Travel				
Supplies	$400	$1,000	$1,500	$2,000
Miscellaneous				
Contracted Services				
Equipment				
Total	$6,520	$7,240	$7,740	$8,240

Schedule

Task

- Waterfowl surveys
- Contacts with citizen groups
- Develop & implement public participation projects



PROJECT OK-6-541-M
COORDINATION OF PUBLIC SCHOOL EDUCATION PROGRAMS

PRIORITY: 1

ISSUE CATEGORIES: Public Awareness and Participation

PROJECT OBJECTIVES: To develop an education program focusing on protection and restoration of aquatic systems by establishing visitor center at Sunnyhill Farm with displays and exhibits and interfacing with other District water resource education programs. The center would be used for teacher in-service training, regional school field trips, and public outreach programs.

JUSTIFICATION/RATIONALE: This project addresses the SWIM Act concern of public awareness and education. Among the most effective ways to build public awareness of water resource problems and solutions is to begin teaching at an early age the importance of our water resources, the problems facing our aquatic systems, and the action individual citizens can take to help solve these problems.

SCOPE OF WORK: Cooperative agreement with Lake County Water Authority to print educational booklet on freshwater wetlands. The first two printings have produced a total of 40,000 booklets. Establish visitor center at Sunnyhill Farm within the framework of developing an Area Management Plan for the property. Educational exhibits, nature trails, canoeing, and a regional bicycle path are anticipated components of this effort.

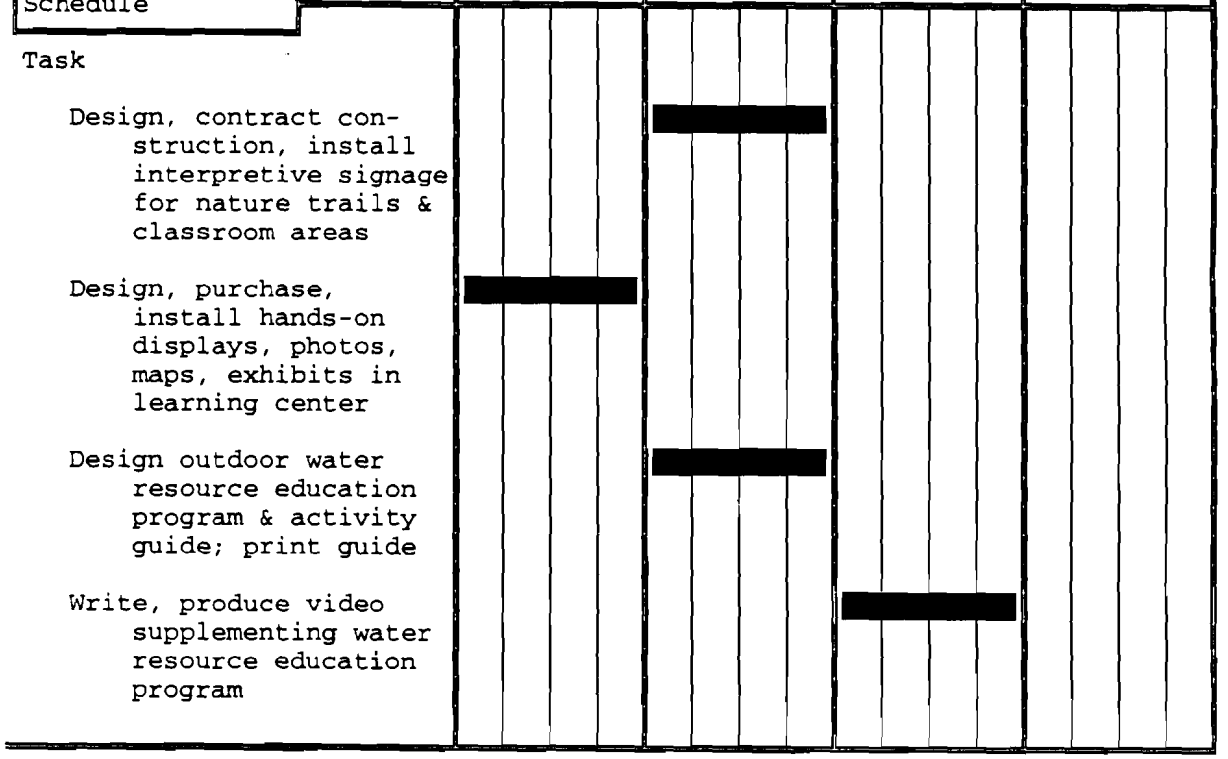
STATUS: Renovation of the old farm house at Sunnyhill Farm and conversion into visitor center/office is expected to be completed in FY 94-95. Other components will be contained in the Area Management Plan for the property.

PROJECT OK-6-541-M
COORDINATION OF PUBLIC SCHOOL EDUCATION PROGRAMS

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$3,000	$3,000	$3,000	$3,000
District Overhead	$600	$600	$600	$600
Expenses				
Travel				
Supplies				
Miscellaneous				
Contracted Services		$10,000	$10,000	$10,000
Equipment				
Total	$3,600	$13,600	$13,600	$13,600

Schedule



PROJECT OK-5-622-S
REVISION OF SWIM PLAN

PRIORITY: 1

ISSUE CATEGORIES: Technical Support

PROJECT OBJECTIVES: To provide updates of the SWIM plan at three year intervals, or more frequently as necessary.

JUSTIFICATION/RATIONALE: This project will develop the management plans required by the SWIM Act.

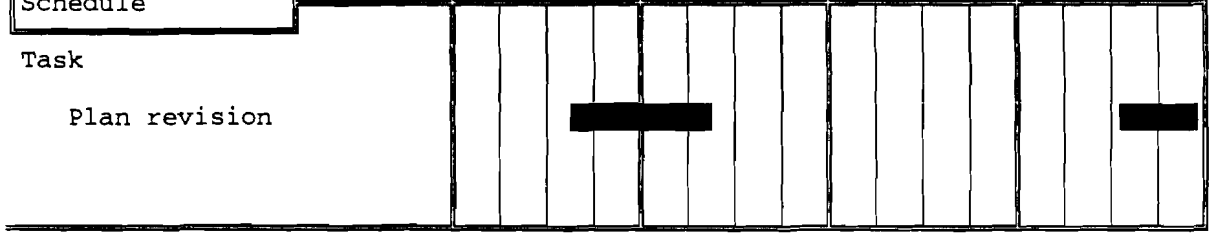
SCOPE OF WORK: Update SWIM plans to include proposed revisions and update information of status of the basin.

STATUS: Revised plan completed March 1995.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$5,550	$4,000		$18,000
District Overhead	$1,110	$800		$3,600
Expenses				
Travel				
Supplies	$200	$200		$3,000
Miscellaneous				
Contracted Services				
Equipment				
Total	$6,860	$5,000	$0	$24,600

Schedule



PROJECT OK-5-623-S
UORB TECHNICAL ADVISORY GROUP

PRIORITY: 1

ISSUE CATEGORIES: Technical Support

PROJECT OBJECTIVES: To provide interagency review and support for the development of the SWIM program.

JUSTIFICATION/RATIONALE: This project will promote interagency coordination and contribute to development of restoration and management plans required by the SWIM Act.

SCOPE OF WORK: Meet regularly to evaluate the SWIM plan, review the progress of the SWIM program, coordinate monitoring and management efforts, develop restoration alternatives.

STATUS: Current membership includes Bill Johnson (FGC), James Higman (DEP), Pete Sleszynski (DEP), Claire Schelske (UF), Richard Roof (Lake County Environmental Services), Jim Barker (Lake County Environmental Services), William Davis (Lake County Water Authority), Jeff Bielling (Marion County Planning), John Bateman, (Orange County Environmental Protection Department), Jim Vearil (COE), and Charles Sheffield.

Budget Estimate	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$4,550	$5,000	$5,000	$5,000
District Overhead	$910	$1,000	$1,000	$1,000
Expenses				
Travel				
Supplies				
Miscellaneous				
Total	$6,000	$6,000	$6,000	$6,000

Schedule

Task

Workgroup meetings

PROJECT OK-5-621-S
ADMINISTRATION OF SWIM PROGRAM

PRIORITY: 1

ISSUE CATEGORIES: Technical Support

PROJECT OBJECTIVES: To provide overall management of the upper Ocklawaha River basin SWIM program.

JUSTIFICATION/RATIONALE: This project will result in improved coordination and management of the UORB restoration and management effort.

SCOPE OF WORK: Provide managerial and secretarial support and interagency coordination. Reports to DEP and other agencies will be prepared as required.

STATUS: Ongoing management efforts will continue for the duration of the SWIM program.

Budget Estimate

	FY 93-94	FY 94-95	FY 95-96	FY 96-97
Salary and Benefits	$24,500	$25,000	$28,000	$30,000
District Overhead	$4,900	$5,000	$5,600	$6,000
Expenses				
Travel	$11,750	$12,000	$15,000	$16,000
Supplies	$5,200	$6,000	$8,000	$9,000
Miscellaneous	$1,000	$1,000	$1,500	$1,500
Contracted Services				
Equipment			$2,000	
Total	$47,350	$49,000	$60,100	$62,500

Schedule

Task

- General program mgmt & interagency coord.
- Report compilation and review

Appendix A

List of Governmental Units having jurisdiction over the water bodies and land within a one mile perimeter of the water bodies.

Federal Government:

1. U.S. Environmental Protection Agency
   Region 4
   345 Courtland Street, N.E.
   Atlanta, GA 30365

2. U.S. Department of Transportation
   Regional Highway Administration
   Region 4
   1720 Peachtree Road, N.E.
   Atlanta, GA 30309-2439

3. U.S. Department of Agriculture

   a. Forest Service
      Region 8
      1720 Peachtree Rd., NW
      Atlanta, GA 30309-2439

   b. Soil Conservation Service State Office
      401 SE 1st Avenue, Rm 248
      Gainesville, FL 32601

   c. SCS Area 3 Office
      (Lake, Orange and Sumter Counties)
      613 6th Street, West
      Palmetto, FL 33651

   d. SCS Area 2 Office
      (Marion County)
      2125 South 1st Street
      Lake City, FL 32055

   e. Agriculture Stabilization and Conservation Service
      P.O. Drawer 670
      Gainesville, FL 32602

   f. ASCS District Director (Marion County)
      Rt. 1, Box 376
      Alachua, FL 32615
      (904) 372-4668

g. ASCS District Director (Lake, Orange and Sumter Counties)
Box 7553
Lakeland, FL 33807
(813) 533-1084

4. U.S. Department of Interior

a. U.S. Fish and Wildlife Service
75 Spring Street, SW
Atlanta, GA 30303

b. U.S. Geological Survey
12201 Sunrise Valley Dr.
Reston, VA 22092

5. U.S. Department of Commerce

a. National Weather Service (NOAA)
Southern Region
819 Taylor Street
Ft. Worth, TX 76102-6614

b. Bureau of Census
Atlanta Region
1365 Peachtree St., N.E.
Atlanta, GA 30309-3123

6. Department of the Army

a. Corps of Engineers
20 Massachussetts Ave., N.W.
Washington, DC 20314

b. Corps of Engineers
Jacksonville District
P.O. Box 4970
Jacksonvile, FL 32232

State Government:

1. Florida Department of Transportation
605 Suwannee Street
Tallahassee, FL 32399-0405

2. Florida Department of Environmental Protection
Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399-3000

3. Florida Game & Fresh Water Fish Commission
620 South Meridan Street
Tallahassee, FL 32399-1600

a) Florida Game & Freshwater Fish Commission
Ocala Regional Office
1239 SW 10th Street
Ocala, FL 32674

b) Florida Game & Freshwater Fish Commission
Eustis Fisheries Laboratory
P.O. Box 1903
Eustis, FL 32726

4. University of Florida
Institute of Food and Agricultural Sciences
Dr. John Waeste, Dean for Extension
1038 McCarthy Hall
Gainesville, FL 32611

5. Florida Department of Community Affairs
Division of Resource Planning and Management
Bureau of Land and Water Management
The Rhyne Building
2740 Centerview Drive
Tallahassee, FL 32399

6. Florida Department of Agriculture and Consumer Services
Plaza Level - The Capitol
Tallahassee, FL 32399-0810

a. Bureau of Soil Water and Conservation
3125 Conner Blvd.
Tallahassee, FL 32301

b. Division of Forestry
3125 Conner Blvd.
Tallahassee, FL 32301

c. Division of Forestry (Marion County)
2735 NE Silver Spring Boulevard
Ocala FL 34470

d. Division of Forestry (Orange, Lake Sumter Counties)
Withlacoochee Forestry Center
15019 Broad Street
Brooksville, FL 35512

7. Department of Health and Rehabilitative Services
1317 Winewood Boulevard
Tallahassee FL 32399-0700

   a. District 3 Office (Lake and Marion Counties)
   HRS
   Building H
   1000 N.E. 16th Avenue
   Gainesville, FL 32601-4598

   b. District 7 Office (Orange County)
   400 W. Robinson Street
   South Tower Suite 1129
   Orlando, FL 32801

Regional Government:

1. St. Johns River Water Management District
Post Office Box 1429
Palatka, FL 32178-1429

2. Southwest Florida Water Management District
2379 Broad Street
Brooksville, FL 33512

3. Withlacoochee Regional Planning Council
1241 S.W. 10th Street
Ocala, FL 32674

4. Eastern Central Florida Regional Planning Council
1011 Wymore Road, Suite 105
Winter Park, FL 32789

5. Ocklawaha River Basin Advisory Council
Post Office Box 1429
Palatka, FL 32178-1429

Soil and Water Conservation Districts:

1. Lake County
Soil and Water Conservation District
12547 Woodlea Rd.
Tavares, FL 32778

2. Marion County
Soil and Water Conservation District
Federal Building, Rm. 226
207 N.W. 2nd Street
Ocala, FL 32670

3. Orange County
Soil and Water Conservation District
2002 East Michigan Street
Orlando, FL 32806

4. Sumter County
Soil Water Conservation District
Earl Building, Highway 48 West
Rt. 1 Box 174
Bushnell, FL 33513

Water Authorities:

1. Lake County Water Authority
Mr. William C. Davis, Director
107 North Lake Ave.
Tavares, FL 32778

2. Zellwood Drainage and Water Control District
3150 Laughlin Road
Zellwood, FL 32798

County Government:

1. Lake County
Board of County Commissioners
P. O. Box 7800
Tavares, FL 32778

2. Marion County
Board of County Commissioners
601 SE 25th Avenue
Ocala, FL 32671

3. Orange County
Board of County Commissioners
P.O. Box 1393
Orlando, FL 32802

4. Sumter County
Board of County Commissioners
209 N. Florida Street
Bushnell, FL 33513

Municipalities:

1. Marion County:

   a. Town of Belleview
   5343 S.E. Abshier Blvd.
   Belleview, FL 32620

b. City of Ocala
P.O. Box 1270
151 S.E. Osceola Ave.
Ocala, FL 32678-1270

2. Lake County:

a. Town of Astatula
P.O. Box 609
Astatula, FL 34705

b. City of Eustis
P.O. Drawer 68
Eustis, FL 32726

c. Town of Fruitland Park
506 W. Berckman Street
Fruitland Park, FL 34731

d. Town of Howey-in-the-Hills
P. O. Box 67
Howey-in-the-Hills, Florida 34737

e. Town of Lady Lake
225 W. Guava Street
Lady Lake, FL 32159

f. City of Leesburg
501 W. Meadow Street
P.O. Box 490630
Leesburg, FL 34749-0630

g. City of Mount Dora
510 Balser St.
P.O. Box 176
Mount Dora, FL 32757

h. City of Tavares
P. O. Box 1068
Tavares, FL 32778

i. City of Umatilla
P.O. Box 420
Umatilla, FL 32784

APPENDIX B

Summary of the Level I hierarchy of the Florida Land Use, Cover and Forms Classification System (FDOT, 1985. Procedure No. 550-010-001-a).

Urban and Built-Up land consists of areas of intensive use with most of the land taken up by man-made structures. The Urban and Built-Up category takes precedence over all other categories when the criteria for more than one land use/cover class are met.

Agriculture lands are defined as those areas which are cultivated to produce food crops, livestock, and other non-food crops.

Rangeland is defined as land where the potential natural vegetation is chiefly grasses, grasslike plants, forbs, or shrubs and is capable of being grazed. Generally this land is not fertilized, irrigated, or cultivated.

Upland Forests are areas which support a tree canopy closure of 10 percent or greater, excluding those areas defined as wetlands. Also included in the Upland Forest category are areas in which timber harvesting has occurred but which exhibit no evidence of alternative development, e.g., clear-cuts in an area where rotation forest management is practiced.

Water areas are predominatly or persistently covered by water. Portions of water bodies having emergent vegetation or observable submerged vegetation are placed in the Wetlands class.

Wetlands are those areas where the water table is at near, or slightly above the land surface for a significant part of the year. The hydrologic regime is established aquatic and/or hydrophylic vegetation. It is important to note that this definition is tailored to the limitations imposed by image analysis which classifies wetlands according to evidence recorded by remotely sensed images. The official definition of a wetland using remotely sensed images cannot be achieved.

Barren Land has very little or no vegetation; it is usually an area of bare soils or rock.

Transportation, Communication and Utilities is a category which includes the facilities associated with the movement of people and goods; airwave communications, radar, and television antennas; and power generating facilities and water and wastewater treatment plants.

APPENDIX C

An annotated list of the major tributaries of the upper Ocklawaha River basin. The leading numbers correspond to the numbers shown on Figure 13.

1. Little Everglades Tributary – a 11.5 mile waterway connecting the Little Everglades swamp and Little Lake Harris, located south southwest of Lake Harris. The approximate drainage area is 20 square miles.

2. Howey Height Tributary – a 2.8 mile waterway connecting Double Run Swamp to Little Lake Harris, located south southeast of Little Lake Harris. The approximate drainage area is 3 square miles.

3. Birdseye Tributary – a 1.6 mile surface water connection only during high water periods between Birdseye Lake and associated wetlands to wetlands east of Little Lake Harris. The approximate drainage area is 2 square miles.

4. Lake Melton Tributary – a 2.2 mile waterway connecting Lake Melton and associated wetlands to wetlands east of Little Lake Harris. The approximate drainage area is 1 square mile.

5. Howey In the Hills Tributary – a 5.5 mile waterway connecting a wetland area near the community of Howey In the Hills with Lake Harris. The approximate drainage area is 5 square miles.

6. Yalaha South Tributary – a 2.9 mile waterway connecting a wetland area south of an embayment southeast of Lake Harris. The approximate drainage area is 2 square miles.

7. Sap Pond Tributary – a 1.7 mile surface water connection during high water periods between Sap Pond and Lake Harris, located south of Lake Harris, west of Yalaha. Holiday Springs discharges into this tributary 0.3 miles south of Lake Harris. The approximate drainage area is 1 square mile.

8. Palatlakaha River – a major contributing surface water system originating in Polk County and discharging into Lake Harris. The approximate drainage area is 221 square miles.

9. Helena Run – a 2.2 mile stream conveying flow from Bugg Spring and Lake Denham, located south of Leesburg on the west side of Lake Harris. The approximate drainage area is 11 square miles.

10. North Flat Island Tributary – a 3.1 mile waterway connecting the fresh water marsh north of Flat Island with Lake Harris and Helena Run. The approximate drainage area is 5 square miles.

11. Dead River (Lake Harris outlet) – a one mile waterway connecting Lakes Harris and Lake Eustis, located west of Tavares. The approximate drainage area is 330 square miles.

12. Lake Ola Canal – a 0.4 mile waterway connecting Ola to east Lake Carlton, located east of the terminus of the Apopka- Beauclair Canal. The approximate drainage area is 3 square miles.

13. Horseshoe Lake Tributary – a one mile waterway connecting Horseshoe Lake and associated wetlands to south Lake Carlton, located east of the terminus of the Apopka-Beauclair Canal. The approximate drainage area is 2 square miles.

14. Lake Carlton/Lake Beauclair Connection – a short, open water connection between the two lakes, located north of Lake Carlton.

15. Apopka-Beauclair Canal – an 8 mile man-made canal connecting Lake Apopka to Lake Beauclair. The approximate drainage area is 135 square miles.

16. Lake Beauclair/Lake Dora Connection – a short, open water connection between the two lakes, located northeast of Lake Beauclair.

17. Lake Saunders Tributary – a 0.5 mile surface water connection between Lake Saunders to Lake Dora during high water periods, located north of Lake Dora. The approximate drainage area is 2 square miles.

18. Dora Canal – an old channelized waterway 1.25 miles long which connects Lakes Dora and Lake Eustis, located along the west side of Tavares. The approximate drainage area is 170 square miles.

19. Hicks Ditch – a 8.3 mile waterway connecting Trout Lake and associated wetlands extending to Lake Umatilla and Lake Joanna to Lake Eustis, located north of Eustis. The approximate drainage area is 18 square miles.

20. Goose Prairie Tributary – a 0.5 mile long waterway connecting Goose Prairie to Lake Eustis, located east northeast of Lisbon. The approximate drainage area is 4 square miles.

21. Haines Creek – a 5.3 mile long waterway connecting Lake Eustis and Lake Griffin, located northeast of Leesburg. The approximate drainage area is 550 square miles.

22. Eagle Nest Tributary – a 1.3 mile waterway connecting wetlands north or Unity Lake to Lake Griffin, located north of Leesburg. The approximate drainage area is 1 square mile.

23. Dead River (Lake Griffin tributary) – a 1.8 mile waterway connecting Lake Unity and associated wetlands in Lake Griffin State Park of Lake Griffin, located north of Leesburg. The approximate drainage area is 4 square miles.

24. North SR44A Tributary – a 1.1 mile waterway connecting small lakes and associated wetlands northwest of Leesburg to Lake Griffin. The approximate drainage area is 1 square mile.

25. Johnson Community College Tributary – a 2.1 mile waterway connecting small lakes and associated wetlands to Lake Griffin, located near Johnson Community College in Leesburg. the approximate drainage area is 2 square miles.

26. Orange Bend Tributary (South) – a 3.5 mile waterway connecting associated wetlands to Lake Griffin, located in Orange Bend. The approximate drainage area is 3 square miles.

27. Orange Bend Tributary (North) – a one mile waterway connecting associated wetlands to Lake Griffin, located in Orange Bend. The approximate drainage area is 1 square mile.

28. Yale-Griffin Canal -- a channelized waterway 3.6 miles long which connects Lake Yale to Lake Griffin and receives pumpage from adjoining muck farms. The approximate drainage area is 40 square miles.

29. Emeralda Marsh Tributary -- a surface water connection between Emeralda marsh and the headwaters of the Ocklawaha River. The approximate drainage area is 8 square miles.

30. South Long Lake Tributary -- a 1.3 mile waterway connecting wetlands south of Long Lake to the Ocklawaha River, located southeast of Moss Bluff. The approximate drainage area is 1 square miles.

31. Lake Pendarvis Tributary -- a 1.3 mile waterway connecting Lake Pendarvis to the Ocklawaha River, located south of Moss Bluff. The approximate drainage area is 3 square miles.

32. Lake Weir Canal -- a 2.3 mile long man-made canal connecting Lake Weir to Tiger Den (south prong of Marshall Swamp), located north of Ocklawaha. The approximate drainage area is 20 square miles.

33. Bowers Lake Canal -- a one mile long man-made canal connecting Smith Lake and Bowers Lake to Tiger Den, located northwest of Ocklawaha. This canal is plugged upstream of CR464S; therefore flow occurs only during periods of high water levels. The approximate drainage area is 9 square miles.

34. Dead River (Marshall Swamp drainage) -- a 0.7 mile waterway connecting Marshall Swamp to the Ocklawaha River, located north of Heather Island. The approximate drainage area is 65 square miles.

35. Mud Prairie Tributary -- a 0.9 mile waterway connecting Mud Prairie Lake to the Ocklawaha River, located northwest of Moss Bluff. The approximate drainage area is 4 square miles.

36. Church Lake Prairie South -- a 5.9 mile waterway connecting a wetlands south of Church Lake Prairie to the Ocklawaha River, located south southwest of Lynne. The approximate drainage area is 8 square miles.

37. Silver River Branch -- a 6.4 mile waterway connecting wetlands north of State Road 40 to the Silver River. The approximate drainage area is 9 square miles.

38. Silver River -- sometimes called the Silver Run, is the outflow from Silver Springs and approximately 6 miles long. The meandering river has a wide floodplain similar to the Ocklawaha River where they meet. The approximate drainage area is 16 square miles.

APPENDIX D

Alphabetic listing of minor lakes (surface area less than one square mile) within the UORB.

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Aiden Pond	40	94	No	29°14'56", 81°52'01"
Bay Lake	25	307	Yes	28°57'02", 81°41'54"
Big Bass Lake	61	286	No[3]	28°59'14", 81°46'54"
Big Prairie	86	584	No	29°04'50", 81°48'40"
Big Steep Pond	32	202	No	29°05'03", 81°49'24"
Birdseye Lake	24	1124	Yes	28°44'40", 80°42'37"
Blue Lake	14	153	No	28°51'20", 81°38'43"
Blue Spring Lake	31	590	No	28°42'27", 80°48'59"
Bowers Lake	633	5364	Yes[2]	29°02'22", 81°57'24"
Brown Pond	19	117	No[3]	29°06'48", 81°51'07"
Buck Pond	13	57	No[3]	29°02'44", 81°49'00"
Bugg Springs	3	991	Yes	28°45'09", 81°54'07"
Cemetery Pond	32	439	No	28°45'09", 81°36'53"
Church Lake	142	1071	Yes	28°38'44", 81°50'36"
Clear Lake	46	212	Yes	28°52'30", 81°39'18"
Clear Lake	50	119	No[3]	29°00'18", 81°51'50"
Cook Lake	20	127	No	28°50'04", 81°46'48"
Crescent Lake	74	314	No	28°56'30", 81°40'40"
Daque Lake	8	44	No	28°44'03", 81°42'00"
Deacon Lake	21	187	No	28°37'07", 81°47'48"

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Dinners Pond	115	575	No[3]	29°01'19", 81°48'20"
Doe Lake	285	458	Yes	29°02'16", 81°49'20"
Doe Pond	3	217	No	29°01'05", 81°43'53"
Duck Pond	42	129	No[3]	29°06'30", 81°51'39"
Dyches Lake	40	119	No	28°48'38", 81°54'13"
East Crooked Lake	152	697	No	28°50'04", 81°39'56"
East Lake	83	309	No	28°55'54", 81°39'18"
Ella Lake	467	4752	Yes	28°57'38", 81°42'35"
Fish Trap Pond	120	317	No[3]	29°03'32", 81°48'08"
Fountain Lake	2	71	Yes	28°48'46", 81°52'42"
Gardner Prairie Lake	75	552	No[3]	29°03'32", 81°47'28"
Gator Lake	32	258	No[3]	28°56'40", 81°52'12"
Gator Pond	2	17	No	29°14'36", 81°51'34"
Grass Pond	159	1138	No	28°46'49", 81°37'05"
Grassy Prairie	130	593	No[3]	29°03'30", 81°48'51"
Green Lake	2	27	Yes	28°50'48", 81°41'42"
Hammock Pond	179	2054	Yes[3]	28°58'44", 81°53'33"
Hart Pond	29	1231	No	29°01'59", 81°46'20"
Holly Lake	96	576	Yes[1]	28°56'11", 81°43'04"
Horseshoe Lake	32	368	Yes	28°45'05", 81°39'49"
Horseshoe Lake	170	1823	No	28°38'23", 81°45'30"
Indian House Lake	137	937	No	28°37'32", 81°49'19"
Indian Prairie	23	105	No	29°06'34", 81°50'43"
Island Lake	135	359	No[3]	28°57'08", 81°41'05"

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Island Lake	60	229	No[3]	29°02'02", 81°47'10"
King Lake	7	35	No	28°44'00", 81°42'14"
Lake Amelia	50	315	Yes	29°04'18", 81°53'55"
Lake Arthur	26	516	No	28°37'36", 81°50'27"
Lake Bell	8	58	No	28°44'34", 81°40'26"
Lake Bertha	2	41	No	28°41'42", 81°46'12"
Lake Bessiola	80	314	No[3]	29°06'48", 81°51'50"
Lake Blanchester	117	640	No	28°54'32", 81°38'33"
Lake Bracy	75	398	Yes	28°53'10", 81°40'47"
Lake Buckhorn	2	21	Yes	29°05'46", 81°51'39"
Lake Burns	12	98	No	28°55'02", 81°38'35"
Lake Carlton	369	2488	Yes	28°45'35", 81°39'32"
Lake Catharine	170	501	No[3]	29°03'38", 81°49'58"
Lake Chloe	13	282	No	28°53'36", 81°40'38"
Lake Clara	1	17	No	28°48'08", 81°58'24"
Lake Cooley	90	229	No[3]	28°56'58", 81°40'22"
Lake Denham	269	4479	Yes	28°46'00", 81°54'26"
Lake Deon	12	82	No[3]	29°04'42", 81°53'40"
Lake Dicie	6	73	No	28°49'54", 81°40'53"
Lake Dixie	5	44	No	28°48'34", 81°53'38"
Lake Dot	7	109	No	28°51'02", 81°40'27"
Lake Eldorado	170	721	No	28°53'00", 81°37'46"
Lake Elsie	15	114	No	28°48'44", 81°42'32"
Lake Elza	32	181	Yes	28°56'06", 81°42'46"

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Lake Enola	45	495	Yes	28°55'26", 81°40'22"
Lake Etowah	17	126	No	28°49'38", 81°42'39"
Lake Fay	82	1252	Yes	29°04'06", 81°53'40"
Lake Frances	23	109	Yes	28°56'04", 81°43'15"
Lake Frances	52	163	No	28°42'57", 81°42'57"
Lake Franklin	7	222	No	28°47'58", 81°37'48"
Lake Geneva	1	180	Yes	28°55'40", 81°40'14"
Lake Gertrude	250	1462	No	28°48'58", 81°39'33"
Lake Gibson	76	288	No[3]	28°56'52", 81°39'09"
Lake Gracie	22	236	No	28°50'46", 81°49'29"
Lake Hermosa	29	122	No	28°50'02", 81°42'12"
Lake Hollywood	9	52	No	28°48'14", 81°53'49"
Lake Idamere	93	505	Yes	28°46'00", 81°44'45"
Lake Idlewild	24	619	No[3]	28°52'48", 81°53'10"
Lake Illinois	25	144	No	28°42'51", 81°46'40"
Lake Jem	19	61	No	28°44'50", 81°39'53"
Lake Joanna	302	1971	Yes	28°50'32", 81°38'42"
Lake John	7	611	Yes	28°48'47", 81°39'04"
Lake Juniata	40	209	No	28°49'16", 81°43'04"
Lake Lena	32	240	No	28°44'22", 81°40'09"
Lake Lincoln	106	1003	No	28°51'52", 81°37'57"
Lake Louise	18	113	No	28°49'22", 81°40'16"
Lake Lucerne	3	93	No	28°48'26", 81°52'56"
Lake Lucille	28	232	No	28°41'12", 81°51'04"

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Lake Maggie	4	83	Yes	28°50'47", 81°39'04"
Lake Margaretta	22	184	No	28°44'32", 81°50'07"
Lake Mary	27	193	Yes	28°55'30", 81°40'38"
Lake Melton	66	938	Yes	28°45'00", 81°43'24"
Lake Myrtle	16	2893	Yes	28°52'29", 81°38'51"
Lake Nettie	45	317	No	28°50'30", 81°39'53"
Lake Newark	35	329	Yes	28°46'38", 81°43'42"
Lake Ola	425	1684	Yes	28°45'13", 81°39'05"
Lake Orchid	4	36	Yes	28°51'42", 81°40'52"
Lake Owen	56	132	Yes	22°56'34", 81°40'52"
Lake Palm	1	129	Yes	28°55'56", 81°40'17"
Lake Pearl	73	462	No[3]	28°56'36", 81°39'31"
Lake Robin Hood	2	18	No	28°47'50", 81°53'40"
Lake Saunders	420	1279	Yes	28°48'44", 81°41'45"
Lake Smith	65	254	No[3]	28°54'00", 81°40'54"
Lake Spencer	52	200	No	28°36'57", 81°50'00"
Lake Swatara	74	2509	Yes	28°51'58", 81°38'37"
Lake Tavares	27	131	No	28°45'26", 81°42'51"
Lake Tem	4	163	No	28°48'30", 81°40'18"
Lake Terry	17	97	Yes	28°45'36", 81°40'21"
Lake Tutuola	1	27	No	28°55'04", 81°40'22"
Lake Umatilla	161	1545	Yes	28°55'12", 81°39'47"
Lake Unity	104	310	Yes	28°52'36", 81°52'41"
Lake Victoria	68	263	No	28°45'02", 81°40'20"

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Lake Virginia	17	986	Yes	28°46'22", 81°43'22"
Lake Whitcomb	30	893	No	28°54'50", 81°38'53"
Lake Woodward	90	527	No	28°49'30", 81°40'45"
Liddy Pond	10	23	No[3]	29°07'16", 81°51'34"
Little Lake Bryant	92	321	No[3]	29°08'50", 81°53'55"
Little Lake Weir	320	1088	Yes	29°01'10", 81°58'40"
Loch Leven	168	435	Yes	28°49'46", 81°38'08"
Long Lake	21	294	No	28°36'27", 81°47'52"
Long Lake	150	402	No[3]	29°05'24", 81°51'05"
Long Pond	110	598	No[3]	29°04'06", 81°48'10"
Mary Lake	230	811	No[3]	28°04'32", 81°49'44"
Montgomery Lake	89	611	Yes	28°38'26", 81°46'13"
Moss Bluff Pond	17	27	No	29°04'32", 81°53'00"
Mud Prairie Lake	400	2684	Yes	29°06'08", 81°45'29"
Mulehead Lake	126	766	No	28°40'53", 82°50'42"
Nancie Prairie	86	1359	No	29°06'07", 81°50'52"
Nicotoon Lake	307	2776	No[3]	28°59'48", 81°43'35"
North Twin Lake	64	263	Yes[3]	28°57'30", 81°39'53"
Pecan Lake	220	669	No[3]	28°02'16", 81°53'39"
Pendarvis	70	1901	Yes	29°04'16", 81°53'00"
Pillans Prairie	47	196	Yes	29°05'57", 81°32'07"
Round Lake	10	185	No[3]	28°46'43", 81°35'43"
Round Lake	30	104	No[3]	29°07'25", 81°54'20"
Round Pond	20	72	No	29°04'34", 81°48'31"

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Saddlebag Lake	12	66	Yes	28°44'24", 81°42'37"
Saddlebag Lake	57	340	No[3]	28°59'20", 81°52'41"
Sams Lake	12	271	No	28°36'57", 81°48'11"
Sap Pond	41	894	Yes	28°44'01", 81°49'29"
Sawdust Lake	2	107	No	28°47'55", 81°36'52"
School House Lake	244	2968	Yes	28°37'10", 84°46'22"
Sellers Prairie	87	375	No	29°06'50", 81°51'33"
Set Pond	40	163	No[3]	29°01'53", 81°46'05"
Shepherd Lake	248	1072	Yes	28°36'58", 81°45'00"
Shoesole	33	188	No[3]	29°07'32", 81°54'40"
Silver Lake	382	1057	No	28°50'26", 81°48'38"
Silver Lake	183	631	No[3]	29°01'00", 81°53'53"
Smith Lake	482	3123	Yes	29°04'12", 81°59'25"
South Moon Lake	20	98	No	29°00'02", 81°52'05"
South Twin Lake	81	543	No[3]	28°57'10", 81°39'58"
Squaw Pond	20	332	No[3]	29°04'46", 81°47'44"
Starkes Prairie	38	1424	No	29°00'35", 81°47'32"
Summerall Lake	19	273	Yes	28°43'54", 81°42'37"
Sunrise	70	455	No[3]	29°07'40", 31°53'37"
Sunset Valley	182	2618	No	28°47'55", 81°36'59"
Swim Pond	75	236	No[3]	29°02'44", 81°49'00"
Thompson Pond	40	584	Yes	29°01'34", 81°49'18"
Tigerhead Lake	70	693	No[3]	28°58'02", 81°52'43"
Tomahawk	75	198	No[3]	29°07'58", 81°54'33"

Lake	Surface Area (Acres)	Drainage Area (Acres)	Surface Water Outlet	Location (Latitude, Longitude)
Trout Lake	12	128	Yes	28°40'09", 81°46'40"
Trout Lake	80	183	No	29°02'59", 81°49'33"
Trout Lake	102	11801	Yes	28°50'00", 81°40'58"
Turkey Lake	45	602	No[3]	28°59'40", 81°45'45"
West Clearwater Lake	25	131	No	29°05'38", 81°50'02"
West Crooked Lake	105	1069	No	28°50'04", 81°40'29"

1. USGS reported that at very high stages Lakes Holly, Ella, and Yale are interconnected, and flow may be diverted northward into Nicotoon Lake; however, the authors believe the extreme stage surface water course is Lake Holly and Ella Lake into Lake Yale.

2. Bowers Lake is normally landlocked except during very high stages when outflow is toward the northeast into Tiger Dan marsh at the south end of Marshall Swamp.

3. Water Resources Research Center, Publication No. 63, Gazetteer of Florida Lakes.

APPENDIX E

Listing of Stormwater and Management and Storage of Surface Water (MSSW) Permits for the UORB.

Explanatory Notes

This appendix lists stormwater and MSSW permits for the upper Ocklawaha River basin in the SJR permit database. Information on MSSW permits issued by FDEP is not provided to the District, and is not included in this listing. In this database, permits are indexed by Section, Township, and Range. As the UORB boundaries do not precisely correspond with Section, Township, and Range boundaries, there are some permits in this list that are outside the basin. As noted in the SWIM plan, Project OK-1-114-M will map major permitted stormwater conveyance systems in the basin.

Information provided in this appendix includes application number, owner and address, project acreage, receiving water body, and expiration date for the permit. For many of the older permits, the owner's address and certain other pieces of information are missing from the permit database. This missing information is available only in paper copy permit records. Because of the large number of permits, we have made no attempt to locate and enter the missing information in this listing.

Permits for Stormwater

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-083-0012AN	NORMA M. HOOKER	4.600	GROUNDWATER	8/13/1991
42-083-0105AN	KWIK KING FOOD STORES INC	1.500		7/ 2/1992
42-083-0127ANG	MARION COUNTY FLORIDA	2.920	NONE	11/ 4/1992
42-083-0148AN	JESSE HARPER, TRUSTEE	15.600	NONE	12/ 7/1992
42-083-0158AN	JOE T. BAGGERLY 3801 N.E. 25TH AVENUE OCALA FL ,32670	11.100	NONE	1/28/1993
42-083-0267ANG	MARION COUNTY BOARD OF COMMISS	4.900		/ /
42-083-0272ANG	MARION COUNTY ATTN: JOSEPH CONE 601 S.E. 25TH AVE OCALA FL ,32674	19.000	NONE	1/ 4/1994
42-083-0287AN	JAMES P. WOLF 1643 S.W. 1ST AVE. OCALA FL ,32674	0.250	NONE	2/27/1989
42-083-0320AN	DENVER L. ELLISON 2226 E. SILVER SPGS BLVD. OCALA FL ,32670	18.070		4/11/1994
42-083-0382AN	CHARLES E. SEILER, JR. 2732 N.E. 70TH STREET OCALA FL ,32670	30.200		10/20/1994
42-083-0443AN	DENVER L. ELLISON 2226 E. SILVER SPGS BLVD OCALA FL ,32670	1.975	GROUNDWATER	8/ 2/1995
42-083-0511AN	CHARLES DEMENZES P O BOX 5220 OCALA FL ,32678	0.000		/ /
42-083-0523AN	FRITZ COTTON 1607 S. E. 18TH AVE. OCALA FL ,32671	0.000		/ /
42-083-0540AN	MED X CORP. 1155 N.E. 77TH STREET OCALA FL ,32670	0.000		/ /
42-083-0619AN	ANTHONY FIRST BAPTIST CHURCH 2551 N.E. 98TH ST. ANTHONY FL ,32617	5.450	GROUND WATER	3/26/1998
42-127-2316ANM	BARNETT BANK OF VOLUSIA COUNTY 230 NORTH WOODLAND AVENUE DELAND FL ,32720	0.528	TOMOKA RIVER	12/13/1998
42-083-0005AN	MONA BRINSON	24.500	NONE	6/13/1991
42-083-0008AN	DON L. HILGEMAN	10.750	WALDENA LAKE	/ /
42-083-0010AN	BARNETT BANK OF MARION COUNTY	1.970	REDWATER LAKE	8/28/1991
42-083-0013AN	CHARLES WAYNE PROPERTIES	9.000	GROUNDWATER	8/18/1991
42-083-0020AN	KWIK KING FOOD STORES	1.615		9/25/1991
42-083-0059AN	B. C. OF JEHOVAH'S WITNESSES	1.960	PERCOLATION	4/ 3/1992
42-083-0118AN	G. DOUGLAS FOREMAN	5.760	NONE	8/25/1992
42-083-0121AN	CHARLES E. DAY	36.710		11/12/1992
42-083-0215AN	HARVEY BOZEMAN 45 N.E. 314-A SILVER SPRINGS FL ,32688	1.200		9/ 7/1993
42-083-0217AN	LEWIS DUBUQUE 233 NEWTON HOOK RD STUYVESANT NY ,12173	26.000	NONE	6/27/1993
42-083-0245AN	DALIN CORPORATION OF OCALA 5724 S.E. 2ND STREET OCALA FL ,32671	0.620	NONE	9/12/1993

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APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-083-0322AN	GRACE BRETHREN CHURCH 3620 N.E. 8TH PLACE OCALA FL ,32670	10.000		5/24/1994
42-083-0333ANG	MARION COUNTY CONNISSION 601 S E. 25TH STREET OCALA FL ,32671	1.680		7/12/1994
42-083-0351AN	DON L. HILGEMAN ROUTE 2 BOX 347-X SILVER SPRINGS FL ,32688	1.510	OKLAWAHA RIVER	10/ 9/1994
42-083-0379ANG	MARION COUNTY BOARD OF COUNTY 601 SE 25TH AVE OCALA FL ,32671	14.900	NA	11/29/1994
42-083-0380AI	FRED JORDAN P.O. BOX 241 CANDLER FL ,32624	0.474	NA	11/27/1995
42-083-0380ANM	FRED JORDAN 42 ALMOND TRAIL OCALA FL ,34472	0.470	GROUND WATER	8/20/1998
42-083-0384AN	DENNIS BRODERICK 8700 CARRIAGE GREENS DARIEN IL ,60559	2.460		11/ 2/1989
42-083-0405AN	EMERGENCY ONE INC. P.O. BOX 2710 OCALA FL ,32678	8.470	NA	1/15/1995
42-083-0432ANG	STATE OF FLORIDA, DEPT. OF NAT ATTN: JAMES ROSS 3900 COMMONWEALTH BLVD TALLAHASSE FL ,32399	0.000		/ /
42-083-0466AN	JERRY A. PITTMAN 5161 N.E. JACKSONVILLE RD ANTHONY FL ,32617	3.380	GROUNDWATER	12/11/1995
42-083-0467AN	E.W. OCALA JOINT VENTURE 990 HAMMOND DRIVE SUITE 620 ATLANTA FL ,30328	0.480		/ /
42-083-0495AN	JAMES F. PORTER 2175 S. E. 58TH AVE. OCALA FL ,32671	2.740	GROUNDWATER	4/ 1/1996
42-083-0514AN	ELVIN PEARSON 537 S.E. 19TH ST. OCALA FL ,32671	0.000	MARSHALL SWAMP	8/15/1996
42-083-0545ANG	MARION COUNTY BOARD OF COUNTY 601 S.E. 25 AVENUE OCALA FL ,32671	1.621	GROUND WATER	3/16/1997
42-083-0547AN	CENTRAL FLORIDA COMMUNITY COLL P. O. BOX 1388 OCALA FL ,32678	0.850	GROUND WATER	3/ 6/1997
42-083-0583AN	CHIPPEWA CHIEF HOMEOWNER'S ASS C/O 1105 SE 3RD AVE. OCALA FL ,32671	4.670		9/14/1997
42-083-0583ANM	CHIPPEWA CHIEF HOMEOWNERS'S AS	4.880	UNNAMED PONDS	8/13/1998
42-083-0584AN	MURPHY DEVELOPMENT OF OCALA ATTN: JERRY MURPHY P. O. BOX 4469 OCALA FL ,32678	35.660	GROUND WATER	8/14/1997
42-083-0585AN	ALLTEL MOBILE 10825 FINANCIAL PKWY STE. 401 LITTLE ROCK AZ ,72211	5.230	GROUND WATER	9/ 3/1997

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42-083-0595ANG	MARION COUNTY BOARD OF COUNTY 601 S.E. 25TH AVE. OCALA FL ,34471	0.220	GROUND WATER	10/ 7/1997
42-083-0602AN	FLORIDA LEISURE ACQUISITIONS C 5656 E SILVER SPGS. BLVD. SILVER SPRINGS FL ,34488	0.920	GROUND WATER	12/ 2/1997
42-083-0637AN	VINCENT MARANO 2245 SE 174TH COURT SILVER SPRINGS FL ,34488	0.310	GROUND WATER	7/ 9/1998
42-083-0638AN	GARRY L. VANHORN 3865 SE 58TH AVE. BASELINE ROAD OCALA FL ,34480	0.120	MARION CO. DETENTION	7/28/1998
42-083-0664ANG	FLORIDA DEPARTMENT OF TRANSPOR 719 SOUTH WOODLAND BLVD. DELAND FL ,32720	7.340	GROUNDWATER	12/16/1998
42-083-0670AN	LAND VENTURE ASSOCIATES P. O. BOX 906 NICEVILLE FL ,32588	84.000	TO LAKE WALDENA	/ /
42-083-0691ANG	FDEP-OFFICE OF GREENWAYS MANAG 325 JOHN KNOX ROAD BUILDING 500 TALLAHASSEE FL ,32302	0.570	N/A	6/ 6/1999
42-083-0695ANG	FLORIDA DEPT. OF ENVIRONMENTAL 3900 COMMONWEALTH BLVD. MAIL STATION 105 TALLAHASSEE FL ,32399	37.510	SILVER RUN	/ /
42-083-0017AN	EDGAR WOLFRAM	14.100		9/26/1991
42-083-0029AN	GENERAL DEV CORPORATION	12.410	MAGNOLIA LAKE	12/12/1991
42-083-0053AN	MARTIN MARIETTA ORLANDO AERO	0.010		4/10/1992
42-083-0086AN	KENNETH T. LEIST	2.190		5/14/1992
42-083-0090AN	ERNEST A. WATSON JR.	1.500		6/ 3/1992
42-083-0091AN	M. MARIETTA ORLANDO AEROSPACE	3.950		6/ 9/1992
42-083-0096AN	ORA EVANS JR.	3.250		6/ 9/1992
42-083-0112ANG	MARION CO. BOARD OF COMM.	1.100	EMERALD LAKE	8/17/1992
42-083-0126AN	KWIK KING FOOD STORE, INC.	1.240	NONE	10/ 8/1992
42-083-0162AN	LUIGI SCALA	2.389	NONE	2/ 4/1993
42-083-0212AN	KWIK KING FOOD STORES ATTN: BRAD DINKINS 101 N.E. 16TH AVE OCALA FL ,32670	1.560		6/27/1993
42-083-0318AN	J.O. TOWNLEY P.O. BOX 221 CANDLER FL ,32111	4.970	NONE	4/11/1994
42-083-0487ANG	BOARD OF COUNTY COMMISSIONERS, ATTN: JOSEPH CONE 111 S.E. 25TH AVE. OCALA FL ,32671	7.230	SMITH LAKE	5/22/1996
42-083-0487ANGM	BOARD OF COUNTY COMMISSIONERS, 111 S.E. 25TH AVE. OCALA FL ,34471	7.230	SMITH LAKE	2/21/1999
42-083-0490AN	LARRY SPIRA AND STEVE BACARDI 1427 SEVENTH STREET, #2 SANTA MONICA CA ,90401	21.120	GROUNDWATER	6/12/1996
42-083-0528AN	NORBERT DORSEY, BISHOP P. O. BOX 1800 ORLANDO FL ,32802	15.800	SMITH LAKE	8/19/1996

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42-083-0568AN	MOSS BLUFF BAPTIST CHURCH 17515 S.E. 95TH ST ROAD OCKLAWAHA FL ,32179	0.330	GROUND WATER	10/26/1997
42-083-0572AN	GEORGIA-PACIFIC CORPORATION P. O. BOX 3810 OCALA FL ,32678	10.420	GROUND WATER	5/19/1997
42-083-0621AN	ROBERT M. SMITH	3.780	GROUND WATER	4/22/1998
42-083-0636AN	R/L INDUSTRIES, INC. P. O. BOX 4024 ELKHART IN ,46514	3.750	GROUND WATER	6/25/1998
42-083-0679AN	MISHKAN MESSIANIC CONGREGATION 6675 SE MARRICAMP RD. OCALA FL ,32672	1.850	GROUND WATER	4/28/1999
42-069-0097AN	LITTLE FOOD TOWN STORES INC	1.395		2/20/1992
42-069-0188AN	COFFMAN, WESTBROCK, ROWLEY &	25.000		/ /
42-069-0430AN	CRAIG SPENCER M.D. ATTN CENTRAL DESIGN GROUP 500 ARDICE AVE. EUSTIS FL ,32726	1.000		4/11/1994
42-069-0573AN	JAMES BARNARD 368 OLD HAVERSTRAW RD SUFFERN NY ,10901	4.420	UNNAMED POND	5/22/1995
42-069-0915AN	LAKE COUNTY BOYS RANCH P. O. BOX 129 ALTOONA FL ,32702	2.600	NONE	/ /
42-069-0952AN	MILLER ENTERPRISES, INC. 331 CENTRAL AVE. CRESCENT CITY FL ,32112	1.990	N/A	/ /
42-083-0025AN	KWIK KING FOOD STORES INC	2.070		4/ 3/1992
42-083-0043AN	GEORGE DELANO	0.790		2/19/1992
42-083-0072AN	RONALD L. EWERS	4.680	LAKE WEIR	/ /
42-083-0073ANG	BRD. OF CNTY. COMMISSIONERS	35.500	BOWERS LAKE	5/20/1992
42-083-0223ANG	MARION COUNTY ATTN: JOSEPH CONE 3330 S.E. MARICAMP ROAD OCALA FL ,32671	22.310		8/31/1993
42-083-0227AN	GUS MULLER 12105 S.E. HWY 441 BELLEVIEW FL ,32620	2.490		9/ 9/1993
42-083-0280AN	ALBERT W. WARD 7017 BENJAMIN STREET MC LEAN VA ,22101	28.800		1/ 9/1994
42-083-0288AN	LAKE WEIR PLAZA INC. 812 S.E. 2ND STREET OCALA FL ,32 67	0.450		5/ 5/1994
42-083-0332ANG	BOARD OF COUNTY COMMISSIONERS 601 SE 25TH AVE. OCALA FL ,32671	29.500	NONE	6/19/1994
42-083-0332ANGM	MARION COUNTY BOARD OF COUNTY 601 SE 25TH AVENUE OCALA FL ,32671	8.750	LITTLE LAKE WEIR	7/ 3/1995
42-083-0343AN	ORA EVANS P.O. BOX 623 BELLEVIEW FL ,32620	0.540	NONE	7/27/1994
42-083-0345AN	CFG CONSTRUCTION 550 MAIN STREET WESTBERRY NY ,11590	24.900		8/ 6/1994

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42-083-0357AN	BEN S. BROWN, JR. P.O. BOX 49 UMATILLA FL ,32784	11.700	UN-NAMED LAKES - WHO	11/17/1994
42-083-0357ANM	FLORIDA ELKS PROPERTIES, INC. P.O. BOX 49 UMATILLA FL ,32784	10.199	GROUNDWATER	5/10/1998
42-083-0385ANG	SHADY ACRES RANCH HOMEOWNERS A 17265 SE 248TH TERRACE UMATILLA FL ,32784	10.300	N/A	11/15/1994
42-083-0397ANG	MARION COUNTY SCHOOL BOARD P.O. BOX 670 OCALA FL ,32678	19.000		1/11/1995
42-083-0410ANG	MARION COUNTY PUBLIC SCHOOLS P.O. BOX 670 512 SE 3RD STREET OCALA FL ,32678	14.800	LAKE WEIR	3/26/1995
42-083-0448AN	MUNIE R. RUPNARAIN P.O. BOX 1010 OKLAWAHA FL ,32179	0.219	N/A	11/ 5/1995
42-083-0453ANG	MARION COUNTY BOARD OF COUNTY 601 S.E. 3RD ST. OCALA FL ,32671	12.500	LAKE WEIR	7/27/1995
42-083-0474AN	DAVE REGISTER	0.830	OKLAWAHA RIVER	4/19/1996
42-083-0481AN	HAROLD B. BOBO 14415 S. HWY 441 SUMMERFIELD FL ,32691	0.760	LITTLE LAKE WEIR	11/20/1995
42-083-0484ANGM	MARION COUNTY 601 SE 25TH AVE OCALA FL ,32671	10.238	GROUND WATER	6/ 9/1997
42-083-0510ANG	MARION COUNTY BOARD OF COUNTY 601 SE 25 AVENUE OCALA FL ,32671	13.710	GROUNDWATER	6/18/1996
42-083-0510ANGM	MARION COUNTY BOARD OF COUNTY	0.370	GROUND WATER	10/11/1996
42-083-0558AN	HENRY PROMINSKI P. O. BOX 540 WEIRSDALE FL ,32195	17.720	LAKE WEIR	4/ 9/1997
42-083-0607AN	DAVE SCHAEFER 9790 SE 160TH LANE SUMMERFIELD FL ,34491	0.227	GROUND WATER	1/20/1998
42-083-0612AN	JANICE & GARY SPARKS & THERESE 10980 TIMICUAN ROAD SUMMERFIELD FL ,34491	0.443	GROUND WATER	4/22/1998
42-083-0651AN	SUMMERFIELD BAPTIST CHURCH 14550 SE 65TH COURT SUMMERFIELD FL ,32601	5.700	GROUND WATER	10/25/1998
42-083-0667AN	ARTHUR W. WHITE P. O. BOX 61 SUMMERFIELD FL ,32691	2.920	GROUND WATER	1/13/1999
42-083-0683ANG	JOSEPH L. CONE, MARION COUNTY C/O JOSEPH L. CONE 601 S.E. 25TH AVE. OCALA FL ,34471	1.160	N/A	4/18/1999
42-083-0689AN	O. G. SHEPPARD & JOHN L. GIBBS P. O. BOX 1386 BELLEVIEW FL ,34421	19.130	CLASS 3, WATER BODY	/ /
42-031-0495AN	CARL OWENS	1.970	DRAIN	8/12/1992
42-069-0011AN	JOHN O'KELLY	21.620	LAKE GRIFFIN	/ /
42-069-0018AN	R. STEVE GRAY	0.790	MAN MADE PIT	8/28/1991

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42-069-0037AN	J.D. FLOYD	4.000	HAINES CREEK	10/21/1991
42-069-0037ANM	J. D. FLOYD 36033 EMERALDA AVE. LEESBURG FL ,32788	42.190	BASIN 1, GROUND WATE	/ /
42-069-0065AN	MINI STORAGE OF LEESBURG	2.320		5/ 7/1992
42-069-0087AN	DONN MONN REALTY	15.400	LAKE YALE	2/10/1992
42-069-0131AN	ALBERT HONEYCUTT	17.200	RETENTION	4/28/1992
42-069-0151AN	WILLIAM E. COLLI	0.490		6/ 2/1992
42-069-0177ANG	LAKE COUNTY BOARD OF CNTY COMM	0.750		/ /
42-069-0186AN	ARNOLD T. JACKSON	0.000		/ /
42-069-0190AN	CHARLES R. STEWART	4.000	NONE	10/26/1992
42-069-0190ANM	CHARLES R. STEWART 37936 HIGHWAY 19 UMATILLA FL ,32784	0.000		/ /
42-069-0244AN	JAMES V. COURSEY P. O. BOX 412 TAVARES FL ,32778	2.000	NONE	1/18/1993
42-069-0244ANM	JAMES V. COURSEY	20.000		6/20/1993
42-069-0279ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN STREET TAVARES FL ,32778	0.560		/ /
42-069-0300AN	HERMAN E. PAYNE 41629 SILVER DRIVE UMATILLA FL ,32784	0.459	NONE	6/ 1/1993
42-069-0305ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	13.800	NONE	6/20/1993
42-069-0322AN	BAIRD MOBILE HOMES OF LEESBURG 1745 E HWY 441 LEESBURG FL ,34748	29.200	NONE	/ /
42-069-0326AN	GORDON SAVAGE P. O. BOX 130 LEESBURG FL ,34749	13.500		9/23/1988
42-069-0394AN	ORANGEWOOD VILLAS LTD 2950 BAYMEADOWS ROAD SUITE 200 JACKSONVILLE FL ,32216	4.110		2/27/1994
42-069-0398ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	2.260		2/ 3/1994
42-069-0398ANMG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	2.260		10/ 9/1994
42-069-0409AN	HARRY B.AND MARY B. BROWN 1022 LOVE'S POINT DRIVE LEESBURG FL ,34748	0.150	NONE	2/27/1994
42-069-0431ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	1.490	NONE	4/18/1994
42-069-0447ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	0.580	EUSTIS MEADOWS	5/19/1994
42-069-0483AN	LOUIS & SANDY ARBOLIDA 3050 EAGLE'S NEST ROAD FRUITLAND PARK FL ,32731	9.840		8/15/1994

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42-069-0500ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	0.870		9/ 7/1994
42-069-0509ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W MAIN STREET TAVARES FL ,32778	13.000		10/18/1994
42-069-0567AN	LARRY GREGORY 10 SOUTH 566 WASHINGTON NAPIERVILLE IL ,60540	7.000	EAST LAKE	11/ 9/1995
42-069-0600AN	LEESBURG HUMANE SOCIETY INC. P.O. BOX 895334 LEESBURG FL ,34789	4.830	EMERELDA MARCH	7/17/1995
42-069-0603AN	LAKE SMITH INDUSTRUAL PARK P.O. BOX 916126 LONGWOOD FL ,32791	7.140	LAKE YALE	10/11/1995
42-069-0605AN	JOHN HUGHES P.O. BOX 1545 MOUNT DORA FL ,32757	0.270	UN-NAMED POND	8/28/1995
42-069-0611AN	LEO STEINMETZ	2.190	GROUND WATER	8/ 9/1995
42-069-0683AN	GOLDEN GEM GROWERS, INC. P. O. DRAWER 9 UMATILLA FL ,32784	3.120	LAKE TUTUOLA	7/11/1996
42-069-0683ANM	GOLDEN GEM GROWERS, INC. P. O. DRAWER 9 UMATILLA FL ,32784	3.860	LAKE TUTOLA	11/27/1996
42-069-0683ANM2	LAKE COGEN LIMITED (BY CONTRAC	5.290	LAKE UMATILLA	3/30/1997
42-069-0683ANM3	GOLDEN GEM GROWERS, INC. P. O. DRAWER 9 UMATILLA FL ,32784	0.700	LAKE EOLA	12/ 4/1997
42-069-0683ANM4	LAKE COGEN, LTD. 1551 N. TUSTIN AVE. SUITE 900 SANTA ANA CA ,92701	5.870	LAKE TUTUOLA	6/21/1998
42-069-0699AN	GEORGE GREEN 124 CRAIG WST. HAZARD KY ,41701	20.000	LAKE ELLA	9/17/1996
42-069-0712AN	GOLDEN GEM GROWERS, INC. P. O. DRAWER 9 UMATILLA FL ,32784	1.970	LAKE TUTOLA	12/18/1996
42-069-0712ANM	GOLDEN GEM GROWERS, INC.	1.970	LAKE DORA	4/15/1997
42-069-0771AN	NORTH LAKE PRESBYTERIAN CHURCH P.O. BOX 1237 LADY LAKE FL ,32159	5.120	LAKE SUNSHINE	6/12/1997
42-069-0787AN	FIRST PRESBYTERIAN CHURCH 493 KENTUCKY AVE. UMATILLA FL ,32784	1.390	LAKE PALM	9/14/1997
42-069-0795ANG	LAKE COUNTY BOARD OF COMMISSIO 315 W. MAIN ST. TAVARES FL ,32778	0.540	UNNAMED POND	8/ 3/1997
42-069-0810AN	BAY STREET BAPTIST CHURCH, INC 1724 S. BAY ST. EUSTIS FL ,32726	5.000	LAKE EUSTIS	11/11/1997
42-069-0812ANG	CITY OF EUSTIS P. O. DRAWER 68 EUSTIS FL ,32727	0.500	LAKE EUSTIS	12/23/1997
42-069-0813ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN STREET TAVARES FL ,32778	2.930	LAKE PEARL	1/11/1998

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42-069-0819AN	FLORIDA FOOD PRODUCTS, INC. P. O. BOX 1300 EUSTIS FL ,32727	2.100	LAKE EUSTIS	11/30/1997
42-069-0824ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	3.520	LAKE COOLEY	12/ 4/1997
42-069-0857ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	9.600	UNNAMED	4/12/1998
42-069-0873ANG	LAKE COUNTY PUBLIC SCHOOLS 201 W. BURLEIGH BLVD. TAVARES FL ,32778	0.300	LAKE GERTRUDE	8/18/1998
42-069-0888ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	15.000	LAKE DALHOUSIE	9/15/1998
42-069-0903AN	JIM CASTIGLIONE 16860 HWY 441 MOUNT DORA FL ,32757	1.730	SNOW LAKE	10/15/1998
42-069-0933AN	MS. CLARA EVERS 18610 U.S. HWY 441 MT. DORA FL ,32757	5.170	LAKE PEARL	3/ 7/1999
42-069-0945AN	HUMANE SOCIETY OF LAKE COUNTY MCKINLEY RD. EUSTIS FL ,32726	4.000	WATER RETENTION AREA	/ /
42-069-0958AN	MERCER PRODUCTS COMPANY, INC. P. O. BOX 1240 EUSTIS FL ,32727	4.410	LAKE YALE	3/28/1999
42-069-0962ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	23.000	UNNAMED LAKE	6/ 6/1999
42-069-0968AN	JEFFREY F. GOSCHE POST OFFICE BOX 1523 LADY LAKE FL ,32159	0.640	CHERRY LAKE	6/15/1999
42-069-0001AN	SEVENTH DAY ADVENTIST CHURCH	5.000	LAKE GERTRUDE	5/16/1991
42-069-0002AN	FRUITLAND PARK OF LAKE COUNTY	6.800	NONE	6/10/1991
42-069-0003AN	FRANK KUTCH JR.	0.300	LAKE HARRIS	6/11/1991
42-069-0004AN	DAVID CAUTHEN (TRUSTEE)	1.140	NONE	6/11/1991
42-069-0004ANM	DAVID E. CAUTHEN, TRUSTEE 131 WEST MAIN STREET TAVARES FL ,32778	0.000		/ /
42-069-0007AN	JOHN D. CARVER	5.000	LAKE GRIFFIN	/ /
42-069-0007ANM	JOHN D. CARVER	5.000		9/ 8/1992
42-069-0008AN	ROGER BONYNGE	0.717	LAKE INDIOLA	/ /
42-069-0010AN	L.B. THOMAS	0.217	LAKE DIXIE	/ /
42-069-0012AN	JAMES B. PARENT	0.523	UNNAMED LAKE	/ /
42-069-0013AN	LEESBURG PROFESSIONAL PROP.	8.264	LAKE HARRIS	/ /
42-069-0016AN	SELLAR,SEWELL,RUSS & SAYLOR	0.708		7/31/1991
42-069-0017AN	KENT ARRINGTON	0.155		10/23/1991
42-069-0019AN	JOHN PRINGLE	33.000		8/ 4/1991
42-069-0022AN	LEESBURG REGIONAL MEDICAL CNTR	12.740	LAKE HARRIS	12/11/1992
42-069-0022ANM	LEESBURG REGIONAL MED CENTER	12.700	LAKE HARRIS	6/ 5/1989
42-069-0023AN	BLUEBERRY HILL APARTMENTS	11.739	LAKE GRIFFIN	/ /
42-069-0024AN	BAIRD MOBILE HOMES OF LEESBURG	12.000		8/25/1991
42-069-0025AN	ALVIN SKINNER	0.730		9/ 5/1991

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42-069-0026AN	PAUL RESOP	1.540		10/ 2/1991
42-069-0028AN	RAX RESTAURANTS INC	0.840	LAKE GRIFFIN	9/ 5/1991
42-069-0028ANM	RAX RESTAURANTS, INC.	0.840	LAKE GRIFFIN	4/ 8/1992
42-069-0029AN	BOB EVANS FARM	1.422	LAKE GRIFFIN	9/18/1991
42-069-0030AN	M.B. O'KELLEY-KANE PATCH	0.435	LAKE GRIFFIN	9/18/1991
42-069-0031AN	SHAMROCK DEVELOPMENT	0.970		10/10/1991
42-069-0039AN	LEESBURG REGIONAL MED CENTER	12.700	LAKE HARRIS	/ /
42-069-0040AN	RUSER MOWER REPAIR	0.506		10/14/1991
42-069-0041AN	JIM HILL	0.346	LAKE HARRIS	10/21/1991
42-069-0043AN	C. R. LANCE PROPERTIES & DEV.	1.580	LAKE HARRIS	10/27/1991
42-069-0044ANG	CITY OF MOUNT DORA	13.100	S.R. DITCH	10/28/1991
42-069-0046AN	CARVER HEIGHTS CHURCH OF GOD	4.950	N/A	10/30/1991
42-069-0048AN	GREGG INVESTMENT LIMITED	1.380	STORMWATER MANHOLE	11/12/1991
42-069-0049ANG	LAKE-SUMTER MENTAL HEALTH CNTR	2.250	RETENTION AREAS	11/14/1991
42-069-0050AN	LEESBURG REGIONAL MED CENTER	0.850	RETENTION POND	11/19/1991
42-069-0052AN	LAROE MCTUREOUS INC	1.350		11/12/1991
42-069-0057AN	LAKE COUNTY BOARD OF CNTY COMM	4.000		11/19/1991
42-069-0060AN	DAN ST PIERRE	0.460		12/16/1991
42-069-0062AN	KEITH SHAMROCK	31.000	COOK LAKE	1/20/1992
42-069-0066AN	WESTSIDE OAKS LTD	12.000		12/ 5/1991
42-069-0067AN	CHARLIE JOHNSON BUILDER INC	0.533		12/16/1991
42-069-0071ANG	CITY OF EUSTIS	7.500		12/23/1991
42-069-0073AN	LAKE COUNTY BOARD OF CNTY COMM	1.150		12/23/1991
42-069-0074AN	LAKE COUNTY BOARD OF CNTY COMM	2.000		12/23/1991
42-069-0075ANG	LAKE COUNTY BOARD OF CNTY COMM	9.200		12/23/1991
42-069-0078AN	J. S. & F. R. HUFF & M. GRAY	21.720		1/ 5/1992
42-069-0079AN	SUNUS CORPORATION	21.100	L EUSTIS/UNNAMED SW	1/ 9/1992
42-069-0080AN	A. BLAINE RANDALL	0.200		1/ 5/1992
42-069-0082AN	LINDEL HOWELL	5.007		1/13/1992
42-069-0084AN	DONALD H. TRACY	2.500		1/27/1992
42-069-0089AN	HENRY & DONALD OUTHOUSE	0.370	LAKE SAUNDERS	2/ 2/1992
42-069-0093AN	K. SHAMROCK	0.720		1/15/1992
42-069-0095AN	LESLIE HAMMOND	0.810		2/18/1992
42-069-0102AN	SUN BANK, N.A.	1.140		2/25/1992
42-069-0107AN	FORD & MINKOFF	2.630	LAKE JUANIATA	3/17/1992
42-069-0110AN	STEVEN & DEBORA HUGHES	1.570		3/17/1992
42-069-0114AN	ERIC H. COE	1.110	LAKE GRIFFIN	4/ 3/1992
42-069-0117AN	CHERYL LUPECKE	22.300		4/10/1992
42-069-0120AN	CLIFFORD M. SHEDD	2.094	SWAMP TO SOUTH	4/10/1992
42-069-0126AN	CITY OF EUSTIS	1.500	LAKE EUSTIS	7/27/1992
42-069-0127AN	CALTON HOMES OF FLORIDA, INC.	32.000	EAST CROOKED LAKE	4/28/1992
42-069-0127ANM	CALTON HOMES OF FLORIDA, INC. 380 S. NORTH LAKE BLVD. ALTAMONTE SPGS. FL ,32701	32.000	EAST CROOKED LAKE	7/13/1997
42-069-0128AN	HARMAR OF HELEN STREET, INC.	31.300	CROOKED LAKE	4/28/1992
42-069-0129AN	JOHN T. MURRELL	0.570		5/19/1992
42-069-0130AN	FIRST CHRISTIAN CHURCH	4.000	RETENTION	4/17/1992
42-069-0133AN	MILLER BROTHERS PARTNERSHIP 331 CENTRAL AVENUE CRESCENT CITY, FL ,32012	1.470	LAKE HARRIS	5/ 6/1992

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42-069-0135AN	CARDINAL INDUSTRIES INC.	4.337	DITCH	5/ 7/1992
42-069-0136AN	LAKE CNTY SHRINE CLUB INC.	1.690		5/ 4/1992
42-069-0139AN	LAKE DORA SHORES-LTD PART.	0.980	LAKE DORA	/ /
42-069-0140AN	KEVCO BUILDERS	0.620	LAKE WOODWARD	5/19/1992
42-069-0142AN	CITY OF LEESBURG	1.400	FOUNTAIN LAKE	5/14/1992
42-069-0147AN	GREG GRUETZMACHER	30.000	ROADSIDE SWALE	5/26/1992
42-069-0148AN	CENTURY 21	0.990		5/14/1992
42-069-0150AN	CARL SOMMERS	0.556	LAKE DYCHES	5/29/1992
42-069-0156AN	DON BEAUMONT	2.165	ON-SITE RETENTION	6/ 9/1992
42-069-0157AN	LOUIS R. BOWEN	10.300		7/13/1992
42-069-0159ANG	LAKE COUNTY BOARD OF CNTY COMM	0.950		6/ 3/1992
42-069-0163ANG	CITY OF EUSTIS	0.180	TROUT LAKE	7/ 9/1992
42-069-0165ANG	LAKE CNTY SCHOOL BOARD	2.250		6/17/1992
42-069-0166ANG	CTY. OF EUSTIS	1.300		6/22/1992
42-069-0170AN	SHAMROCK DEVELOPMENT CORP.	1.820		6/30/1992
42-069-0171AN	TRIANGLE INDUSTRIAL PARK	1.300	LAKE DORA	6/30/1992
42-069-0173AN	HAMPTON VILLAS LTD.	1.500		8/25/1992
42-069-0174ANG	CITY OF TAVARES	1.160	NONE	8/25/1992
42-069-0175ANG	CITY OF TAVARES	0.770	NONE	8/25/1992
42-069-0176AN	SHADER LEESBURG PARTNERSHIP	4.270	UNNAMED POND	9/ 8/1992
42-069-0179ANG	LAKE CNTY SCHOOL BOARD	1.500		8/11/1992
42-069-0180AN	MT. DORA PROPERTIES TRUST	1.340		8/20/1992
42-069-0182AN	SHAMROCK DEVELOPMENT CORP.	16.620	NONE	12/17/1992
42-069-0184AN	KEVIN BURKHOLDER	11.160	BLUE LAKE	8/31/1992
42-069-0185AN	FLA. DOT	1.900		9/14/1992
42-069-0187AN	DWIGHT & JANELLE SUNDEEN	0.740	LAKE DENHAM	9/17/1992
42-069-0195AN	DIVERSICARE CORPORATION	0.069	NONE	10/ 7/1992
42-069-0200ANG	LAKE COUNTY BD OF CNTY COMM	2.400	NONE	11/ 4/1992
42-069-0205AN	FLORIDA NATIONAL BANK	1.580		12/ 7/1992
42-069-0207ANG	LAKE COUNTY BOARD OF CO COMM	1.100	NO DIRECT DISCHARGE	11/24/1992
42-069-0211AN	CARL SOMMERS	1.250	NONE	11/10/1992
42-069-0214AN	PEPPER RIDGE ADULT MOBILE VLGE	0.530	LAKE GRIFFIN	11/10/1992
42-069-0215AN	CENTRAL FLORIDA YMCA	9.100	LAKE SAUNDERS	11/10/1992
42-069-0217AN	BILL CORRIGAN	0.300	LAKE GRIFFIN	11/17/1992
42-069-0220AN	GRACE BIBLE CHURCH	3.500		3/24/1993
42-069-0224AN	CHET BLACKMAN	0.200	N/A	12/30/1992
42-069-0227AN	MEADOWS INCORPORATED	2.420		3/ 9/1993
42-069-0228AN	DEVELOPMENT REBOUND, INC.	19.300	WOLF CREEK	3/21/1993
42-069-0234AN	JACK N. PURDUM TRUST 5374 S. HWY 441 LEESBURG FL ,34788	29.000	UNNAMED POND	2/16/1993
42-069-0235AN	OMER A. SCHROCK 12 LAKE WOODWARD DR EUSTIS FL ,32726	0.720	NONE	1/ 7/1993
42-069-0236AN	FIRST NATL. BANK OF MOUNT DORA	1.780		12/10/1992
42-069-0240ANG	LAKE COUNTY BOARD OF CO COMM	1.700		12/30/1992
42-069-0241AN	FRANK KUTCH 32811 U.S. HWY 441 LEESBURG FL ,34748	0.460	UNNAMED SWAMP	1/28/1993

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42-069-0246AN	GEORGE AND JOHN PRINGLE SCOTTISH HGHLANDS BLVD HIGHWAY 473 LEESBURG FL ,34788	1.450		2/23/1993
42-069-0251ANG	CITY OF TAVARES 201 E MAIN ST TAVARES FL ,32778	1.170	NONE	1/28/1993
42-069-0253AN	EUSTIS CONGREGATE, LTD. P. O. BOX 1811 LAKE MARY FL ,32746	5.950	NONE	2/16/1993
42-069-0258AN	FARNER, BARLEY & ASSOCIATES, I 101 MAUD STREET TAVARES FL ,32778	0.450	LAKE DORA	3/ 2/1993
42-069-0260AN	BLUEFIELD PRODUCE AND PROVISIO 4005 CROMBWELL ROAD CHATTANOOGA TN ,37422	30.000		5/11/1993
42-069-0261AN	JOHN OKELLEY 205 N. BOULEVARD LEESBURG FL ,34748	19.390	NONE	3/ 9/1993
42-069-0262AN	JAMES C. HARRIS, JR. P. O. BOX 987 MT. DORA FL ,32757	2.500	UNNAMED POND	3/ 9/1993
42-069-0262ANM	JAMES C. HARRIS P.O. BOX 987 MOUNT DORA FL ,32757	12.200	GRASS POND	6/26/1997
42-069-0264AN	RUDY HOLTON, M.D. P. O. BOX 1515 MOUNT DORA FL ,32757	4.500	NONE	1/28/1993
42-069-0266ANG	CITY OF TAVARES 201 E MAIN STREET TAVARES FL ,32778	0.574	NONE	3/ 2/1993
42-069-0267ANG	CITY OF TAVARES 201 E MAIN STREET TAVARES FL ,32778	1.051	NONE	3/ 2/1993
42-069-0268ANG	CITY OF TAVARES 201 E MAIN STREET TAVARES FL ,32778	1.647	NONE	3/ 2/1993
42-069-0269ANG	CITY OF TAVARES 201 E MAIN STREET TAVARES FL ,32778	1.148	NONE	3/ 2/1993
42-069-0271AN	ANN COPELAND 907 NORTH SHORE DRIVE LEESBURG FL ,34748	0.321	LAKE GRIFFIN	3/15/1993
42-069-0273ANM	DR. ELDON BUNN	0.870		11/ 1/1994
42-069-0277AN	HARVY H. MIELKE 1700 EAST LINDALE AVE. EUSTIS FL ,32726	1.400	UNNAMED POND	5/ 5/1993
42-069-0278AN	MAURICE WELLS 1021 MCNAMEE STREET LEESBURG FL ,34748	0.367	NONE	9/ 8/1993
42-069-0280AN	LAKCO LAND TRUST ATTN: RICHARD J. FRITCH P. O. BOX 648 WEIRSDALE FL ,32195	5.900	LAKE DORA	5/ 5/1993
42-069-0281ANG	CITY OF MOUNT DORA ATTN: TONY SEGRETO P. O. BOX 176 MOUNT DORA FL ,32757	15.000		/ /

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42-069-0283ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W MAIN STREET TAVARES FL ,32778	0.330	NONE	3/21/1993
42-069-0284AN	MIKE SPRADLIN 807 N. BLVD WEST LEESBURG FL ,34748	0.290	NONE	3/24/1993
42-069-0286AN	LAKE-SUMTER COMMUNITY MENTAL H P. O. BOX 2024 LEESBURG FL ,34749	1.000	LAKE GRIFFIN	11/16/1994
42-069-0288AN	J.D. FLOYD ROUTE 2 BOX 222 LEESBURG FL ,34748	6.400		5/ 2/1993
42-069-0291ANG	CITY OF MOUNT DORA ATTN: TONY SEGRETO P. O. BOX 176 MOUNT DORA FL ,32757	4.600	LAKE DORA	6/ 1/1993
42-069-0292AN	ELIZABETH PRINGLE 427 S. 9TH STREET LEESBURG FL ,34748	0.260		5/ 2/1993
42-069-0294AN	LAKE SUMTER COMMUNITY MENTAL H ATTN: BER5 LACY P. O. BOX 2024 LEEESBURG FL ,34748	6.950		/ /
42-069-0294ANM	LAKE SUMTER MENTAL HEALTH CENT ATTN: JACK HARGROVE JR. P.O. BOC 1000 LEESBURGE FL ,34749	0.290		2/ 9/1994
42-069-0295AN	EDWARD & CINDY WHEELER P. O. BOX 174 GRAND ISLAND FL ,32735	0.000		/ /
42-069-0301AN	FIRST BAPTIST CHURCH OF FRUITL ATTN: THOMAS LINGERFELT 509 W. BERCKMAN STREET FRUITLAND PARK FL ,34731	2.640	LAKE TEM	6/ 3/1993
42-069-0306ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W MAIN STREET TAVARES FL ,32778	7.300		6/20/1993
42-069-0311AN	CLIFFORD M. SHEDD 5109 MORTIER AVE. ORLANDO FL ,32812	1.790	SWAMP TO SOUTH	7/25/1993
42-069-0312AN	JEFF DEARING P. O. BOX 467 LEESBURG FL ,34748	3.650		8/ 2/1993
42-069-0315AN	GRACE BAPTIST CHURCH 1900 BUENA VISTA EUSTIS FL ,32726	5.700	LAKE LINCOLN	6/27/1993
42-069-0317AN	BESCO ELECTRIC EMPLOYEES PROFI ATTN: DOUGLAS BRAUN 711 SOUTH 14TH STREET MT DORA FL ,32757	1.390	LAKE SAUNDERS	7/25/1993
42-069-0318AN	GREG SHAMROCK 2100 LAKE EUSTIS DR TAVARES FL ,32778	0.460	LAKE SAUNDERS	7/25/1993
42-069-0330AN	LEESBURG REGIONAL MEDICAL CENT ATTN: TED WOODRELL 600 E. DIXIE AVE. LEESBURG FL ,34748	0.380		/ /
42-069-0335AN	HANDEX OF FLORIDA, INC. ATTN: WILLIAM I. BOOGAR P. O. BOX 1579 MT DORA FL ,32757	2.210		9/ 7/1993

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42-069-0335ANM	HANDEX OF FLORIDA, INC. 30940 SUNEAGLE DR. MOUNT DORA FL ,32757	0.370	SAND LAKE	4/15/1997
42-069-0336ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	6.800		7/25/1993
42-069-0339AN	MEL BISHOP ENTERPRISES 196 EVERGREEN LANE LADY LAKE FL ,32159	0.880		9/ 7/1993
42-069-0340AN	CIRCLE K GENERAL, INC. ATTN: BILL REESE P. O. BOX 918 MANGO FL ,33550	1.210		/ /
42-069-0341AI	CHAMAS, INC. ATTN: PAUL C. THOMAS 1908 ORANGE AVE. EUSTIS FL ,32726	0.000		/ /
42-069-0343ANG	CITY OF EUSTIS ATTN: MICHAEL G. STEARMAN P. O. DRAWER 68 EUSTIS FL ,32727	0.620		9/12/1993
42-069-0344ANG	CITY OF LEESBURG ATTN: R.A. WILLIAMS P. O. BOX 630 LEESBURG FL ,34748	5.770	LAKE HARRIS	/ /
42-069-0347AN	LAKE SQUARE PRESBYTERIAN CHURC ATTN: BARRY LONG, III ROUTE 5, BOX 293-A LEESBURG FL ,34788	2.330		9/26/1993
42-069-0348ANG	CITY OF TAVARES ATTN: ANTHONY G. OTTE 201 E MAIN STREET TAVARES FL ,32778	2.030		/ /
42-069-0349AN	DENNIS J. ROBSON 307 N.E. 36TH AVE #1 OCALA FL ,32671	0.320	LAKE GRIFFIN	9/28/1993
42-069-0350AN	SUN BANK NA P. O. BOX 8 LEESBURG FL ,34748	1.020	LAKE EUSTIS	12/ 5/1993
42-069-0353AN	GEORGE R. IKELER & JOHN E. DRI 720 N BAY STREET EUSTIS FL ,32726	1.200		9/26/1993
42-069-0354AN	QUALITY PETROLEUM ATTN: RALPH WEEKS P. O. DRAWER AA LAKELAND FL ,33802	1.040	LAKE HARRIS	8/17/1994
42-069-0355AN	PAT'S SALES ATTN: PATRICK DENSON 1830 E HWY 441 LEESBURG FL ,34748	2.520		9/30/1993
42-069-0356AN	DAVE CAUTHERN, GENERAL PARTNER 131 WEST MAIN STREET TAVARES FL ,32778	1.510		/ /
42-069-0357AN	GROWERS CONTAINER COOPERATIVE ATTN: JERRY THORPE WEST TALLY ROAD LEESBURG FL ,34748	1.030	NONE	9/30/1993
42-069-0361AN	LOYD ATKINS, JR. & SAMUEL S. S P.O. BOX 7 MOUNT DORA FL ,32757	16.950		/ /

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42-069-0362AN	LEWIS BROWN 5700 NW 34TH ST. SUT 1307 GAINESVILLE FL ,32606	4.360		/ /
42-069-0364ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	1.000		11/21/1993
42-069-0374AN	ABCD FUTURES CORP. ATTN: L.E. BOWEN III P.O. BOX 2048 EUSTIS FL ,32727	0.920		12/ 5/1993
42-069-0375AN	G & G AIRCRAFT, INC. ATTN: CHARLES W. GREGG 901 WEST MAIN STREET LEESBURG FL ,34748	0.540		12/ 6/1993
42-069-0378AN	JOHN & BONNIE DARROW 40 BANNING BEACH ROAD TAVARES FL ,32778	1.930	SILVER LAKE	12/ 6/1993
42-069-0379AN	GROVER LEE MARTENY 16 EAST DICIE STREET EUSTIS FL ,32726	0.350		12/14/1993
42-069-0380AN	MID-LAKES CHRISTIAN CHURCH ATTN: JIM LONGLEY CNTY RD 473 BOX 32714 LEESBURG FL ,34788	1.330	LAKE EUSTIS	2/ 9/1994
42-069-0384ANG	LAKE COUNTY EDUCATION ASSOCIAT 1707 SIUTH STREET LEESBURG FL ,32784	0.400		/ /
42-069-0385ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	4.700		2/23/1994
42-069-0391AN	MAYFIELD RETIREMENT CENTER ATTN: CHARLOTTE MAYFIELD 406 NEWELL HILL ROAD LEESBURG FL ,34748	3.360	NONE	1/16/1994
42-069-0391ANM	MAYFIELD RETIREMENT CENTER INC ATTN: CHARLOTTE MAYFIELD 460 NEWELL HILL ROAD LEESBURG FL ,34748	3.360	LAKE GRIFFIN	8/29/1996
42-069-0391ANM2	MAYFIELD RETIREMENT CENTER INC ATTN CHARLOTTE MAYFIELD 460 NEWELL HILL ROAD LEESBURG FL ,34748	3.360	LAKE GRIFFIN	6/ 8/1997
42-069-0392AN	GEORGE O. PRINGLE & JOHN A. PR D.B.A. HIGHLANDS CENTER 1 SCOTTISH HIGHLANDS BLVD LEESBURG FL ,34788	0.680		/ /
42-069-0393AN	SUMMIT LANDING PARTNERSHIP ATTN: JOE GODFREY P.O. BOX 855247 LEESBURG FL ,34788	32.000		5/29/1994
42-069-0397ANG	BOARD OF COUNTY COMMISSIONERS, 315 W. MAIN STREET TAVARES FL ,32778	0.200		2/ 1/1994
42-069-0399AN	DOLORES LEN 2900 KURT STREET EUSTIS FL ,32726	3.850	NONE	2/ 1/1994
42-069-0407AN	EASTERN MARKETING GROUP, INC. ATTN: TIM COLLINS 17841 US HWY 441 SUITE 3 MT. DORA FL ,32757	7.020	LAKE DORA	3/31/1994

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42-069-0408AN	FLORIDA SPA AND BATH COMPANY ATTN: EDWARD SKEEHAN 2545 SOUTH STREET LEESBURG FL ,34748	2.500		3/20/1994
42-069-0410AN	A. MUNROE SARVIS 10934 MEMORY LANE TAVARES FL ,32778	0.586	LAKE DORA	4/21/1994
42-069-0411ANG	THE CITY OF EUSTIS P.O. DRAWER 68 EUSTIS FL ,32727	1.750	NONE	3/10/1994
42-069-0414AN	P.S. ENTERPRISES ATTN: PHILLIPS, SLOMAN 1200 WEST MEMORIAL BLVD. LAKELAND FL ,33801	2.310	NONE	6/ 1/1994
42-069-0416AN	HARRY AND MARTHA WILDS 2103 COUNTRY CLUB DRIVE EUSTIS FL ,32726	0.000	LAKE NETTIE	5/11/1994
42-069-0417ANG	LAKE COUNTYBOARD OF COUNTY COM 315 W. MAIN STREET TAVARES FL ,32778	0.000	NO DIRECT DISCHARGE	3/15/1994
42-069-0419AN	SALLY SEABROOK 140 EAST 7TH AVENUE MOUNT DORA FL ,32757	0.200	NONE	3/17/1994
42-069-0422AN	JIM DART, RICHARD GERTH, MONTY P.O. BOX 573 TAVARES FL ,32778	2.590	NONE	3/20/1994
42-069-0423AN	DR. JASON BURGOS, M.D. 1140 S. GROVE STREET EUSTIS FL ,32726	0.450	LAKE EUSTIS	3/24/1994
42-069-0424AN	GEORGE UTZ 499 JUDITH AVE. FRUITLAND PARK FL ,34731	3.000	DEAD RIVER	11/ 9/1994
42-069-0429AN	COCA-COLA FOODS 2000 ST.JOHNS PLACE P.O. BOX 2079 HOUSTON TX ,77056	1.400		4/12/1994
42-069-0429ANM	COCA-COLA FOODS 2000 ST. JAMES PLACE P.O. BOX 2079 HOUSTON TX ,77008	10.500	LALE GRIFFIN	7/12/1994
42-069-0437AN	MICHAEL AND GLORIA HAHN 302 SOUTH HIGHWAY 19A MT. DORA FL ,32757	0.480	NONE	7/20/1994
42-069-0438AN	FIRST BAPTIST CHURCH OF MT. DO P.O. BOX 1216 MT. DORA FL ,32757	5.470	NONE	4/28/1994
42-069-0438ANM	FIRST BAPTIST CHURCH OF MOUNT P.O. BOX 1216 MOUNT DORA FL ,32757	0.000		/ /
42-069-0439AN	LEESBURG LODGE NO. 58 F. & A.M P.O. BOX 1041 FRUITLAND PARK FL ,34731	2.000		4/28/1994
42-069-0443AN	WILKINSON GROUP, INC. T1990 W. NEW HAVEN AVE. SUITE 310 MELBOURNE FL ,34773	0.330		7/10/1994
42-069-0448AN	JESSIE RAINES 227 JOANNA AVENUE TAVARES FL ,32778	0.000	LAKE EUSTIS	7/20/1994

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42-069-0450AN	MICHAEL MATHESON 8301 S.W. 53 AVENUE MIAMI FL ,33143	0.450	NONE	5/24/1994
42-069-0453ANG	FLORIDA DEPARTMENT OF TRANSPOR 1306 DELON AVENUE LEESBURG FL ,34748	0.214		5/19/1994
42-069-0454ANG	LAKE COUNTY 315 WEST MAIN STREET TAVARES FL ,32778	0.000		/ /
42-069-0455AN	GENERAL MILLS RESTAURANTS INC. 6770 LAKE ELLENOR DR ORLANDO FL ,32859	6.220	LAKE HARRIS	5/29/1994
42-069-0459ANG	LAKE COUNTY SCHOOL BOARD 201 WEST BURLEIGH BLVD TAVARES FL ,32778	1.900		/ /
42-069-0462AN	CHURCH OF THE NAZARENE POST OFFIC EBOX 1048 TAVARES FL ,32778	3.000	NONE	6/20/1994
42-069-0464AN	JAMES W. YOUNG & JACK CASSELL 33 WILT STREET EUSTIS FL ,32726	1.620	NONE	7/10/1994
42-069-0466AN	LEESBURG DEVELOPMENT CO. ATTN: FRANK GULISANO 200 W PALMETTO PARK ROAD BOCA RATON FL ,33432	1.300	LAKE GRIFFIN	9/19/1989
42-069-0466ANM	LEESBURG DEVELOPMENT COMPANY 200 WEST PALMETTO PARK RD BOCA RATON FL ,33432	1.300	LAKE GRIFFIN	5/16/1996
42-069-0467AN	JACK N. PURDUM LIVING TRUST 5374 SOUTH HWY 441 LEESBURG FL ,34788	0.520	NONE	6/21/1994
42-069-0469ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREE TAVARES FL ,32778	7.600		7/17/1994
42-069-0470AN	DELBERT COPELAND 1310 NORTH SHORE DRIVE LEESBURG FL ,32748	0.320		7/20/1994
42-069-0475AN	CITIZENS NATIONAL BANK OF LEES ATTN: RALPH BUCHANAN P.O. BOX 47 LEESBURG FL ,34748	3.680		8/ 2/1994
42-069-0476AN	LAKE CARDIOLOGY FOURTH AVE MOUNT DORA FL ,32757	0.620		8/ 2/1994
42-069-0476ANM	DR. KEN KRONHAUS, M.D. 4850 NORTH HIGHWAY 19-A MOUNT DORA FL ,32757	0.820	LAKE DORA	7/23/1996
42-069-0476ANM2	DR. KEN KRONHAUS, M.D. 4850 N. HIGHWAY 19-A MT. DORA FL ,32757	0.102	LAKE DORA	1/22/1998
42-069-0480AN	MT. ZION PRIMITIVE BAPTIST CHU ATTN: REV EZEKIAL ROLLINS 520 N. PRESCOTT STREET EUSTIS FL ,32726	0.740	NONE	8/ 3/1994
42-069-0482ANG	LAKE COUNTY BOARD OF COMMISSIO 315 WEST MAIN STREET TAVARES FL ,32778	19.900	DORA CANAL	/ /
42-069-0488AN	BOB HUMPHREY 4075 N. HIGHWAY 19-A MOUNT DORA FL ,32757	0.910	NONE	9/22/1994

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42-069-0489AN	CHARLES W. SHEPHERD III C/O METRO STEEL 932 E. MAIN STREET LEESBURG FL ,32748	1.030	NONE	8/12/1994
42-069-0497AN	DAVID CAUTHEN 131 WEST MAIN STREET TAVARES FL ,34778	1.510		9/13/1994
42-069-0501ANG	LAKE COUNTY BOARD OF COUNTY CO	19.900		/ /
42-069-0503AN	EARL GOLDSWORTHY 734 N 3RD ST, SUITE 108 LEESBURG FL ,32748	2.460		9/25/1994
42-069-0507AN	OMER SCHROCK 3007 LAKE WOODWARD EUSTIS FL ,32726	9.800	LAKE TAVARES	10/18/1994
42-069-0508AN	HUNT PAULING 205 N BOULEVARD WEST LEESBURG FL ,32748	5.200	N/A	11/15/1994
42-069-0510AN	WILLIAM E. GOLDEN 100 SHANGRI-LA BLVD. LEESBURG FL ,34788	13.500	LAKE EUSTIS	/ /
42-069-0511AN	JUGLE E. SMITH P.O. BOX 490940 LEESBURG FL ,34749	1.460	GROUNDWATER	12/ 4/1994
42-069-0512AN	DAVE DAUGHERTY RT. 1 BOX 136 SORRENTO FL ,32776	1.000	GROUNDWATER	12/15/1994
42-069-0515AN	CITIZENS NATIONAL BANK OF LEES 1211 W NORTH BLVD P.O. BOX 490047 LEESBURG FL ,34749	0.750	LAKE GRIFFIN	12/ 4/1994
42-069-0516ANM	WINCHESTER ESTATES GENERAL PAR 201 SHADY OAKS COURT LAKE MARY FL ,32746	11.300	LAKE JOANNA	12/ 1/1998
42-069-0517ANG	MOUNT DORA DOWNTOWN REDEVELOPM P.O. BOX 1632 MOUNT DORA FL ,32757	0.000	LAKE DORA	12/15/1994
42-069-0521AN	EMPIREGAS INC. OF LEESBURG ATTN: BEN CLAY P.O. BOX 841 LADY LAKE FL ,32159	1.350	GROUNDWATER	11/17/1994
42-069-0522AN	DR. JAMES YOUNG 38 WILT STREET EUSTIS FL ,32726	0.490	GROUNDWATER	11/16/1994
42-069-0523AI	ANN PEMBLE 710 S CARPENTER AVE LEESBURG FL ,34748	0.290	GROUNDWATER	3/26/1995
42-069-0530AN	KENT FULLER P.O. BOX 490779 LEESBURG FL ,34749	2.240	UN-NAMED POND	1/25/1995
42-069-0532ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W MAIN ST TAVARES FL ,32778	1.480	WOLF BRANCH CREEK	1/ 2/1995
42-069-0533AN	KEVIN BURKHOLDER P.O. BOX 1545 MOUNT DORA FL ,32757	0.770	GROUNDWATER	12/18/1994
42-069-0533ANM	KEVIN BURKHOLDER	0.775	GROUNDWATER	7/24/1995
42-069-0543AN	DISCOUNT AUTO PARTS, INC. P.O. BOX 8080 LAKELAND FL ,33801	0.560	GROUNDWATER	2/ 7/1995

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42-069-0545AN	CLEMENTS CLASSIC PEST CONTROL 3004 CASTEEN RD LEESBURG FL ,34748	2.920	GROUNDWATER	2/15/1995
42-069-0549AN	JOSANE INVESTMENTS, INC. 411 W WOODWARD AVE EUSTIS FL ,32726	1.620	LAKE EUSTIS	5/15/1995
42-069-0554AN	LAKE BUSINESS INC. 10341 SUMMIT SQUARE DR LEESBURG FL ,34788	3.280	GROUNDWATER	1/22/1995
42-069-0555AN	LAKE COUNTY SCHOOLS CREDIT UNI 15120 US HWY 441 TAVARES FL ,32778	2.800	GROUNDWATER	3/ 6/1995
42-069-0556AN	ED BIXBY P.O. BOX 331 HOWEY-IN-HILLS FL ,34797	0.320	GROUNDWATER	3/ 8/1995
42-069-0560AN	FAITH EVANGELICAL FREE CHURCH 1107 GRIFFIN RD LEESBURG FL ,34748	0.070	UNNAMED POND	3/22/1995
42-069-0561AN	BOYS & GIRLS CLUB OF LAKE COUN P.O. BOX 1527 LEESBURG FL ,34749	12.000	LAKE DENIUM	7/27/1995
42-069-0566AN	PYRAMID DEVELOPMENT CORP. 734 N 3RD ST, STE 503-1 LEESBURG FL ,34748	0.410	UNNAMED POND	4/ 5/1995
42-069-0571AN	IRMGARD WENZEL 7720B EL CAMINO, S289 RANCHO LA COSTA CA ,92009	1.030	LAKE LINCOLN	5/24/1995
42-069-0572AIM	LEESBURG REGIONAL MEDICAL CENT 600 EAST DIXIE AVENUE LEESBURG FL ,34748	15.810	LAKE HARRIS THROUGH	7/ 9/1996
42-069-0572AN	LEESBURG REGIONAL MEDICAL CENT 600 E DIXIE AVE LEESBURG FL ,34748	2.410	LAKE HARRIS	8/14/1995
42-069-0572ANM2	LEESBURG REGIONAL MEDICAL CENT 600 E. DIXIE AVE. LEESBURG FL ,34748	3.750	LAKE HARRIS	8/10/1997
42-069-0572ANM3	LEESBURG REGIONAL MEDICAL CENT 600 E. DIXIE AVE. LEESBURG FL ,34748	3.400	LAKE GRIFFIN	3/ 3/1998
42-069-0576AN	CARE DIVERSIFIED OF LAKE COUNT 10515 U.S. HIGHWAY 441 LEESBURG FL ,34788	0.320	GROUND WATER	6/14/1995
42-069-0586ANM	CHARLES SELIGMAN	0.415	LAKE EUSTIS	11/15/1995
42-069-0591ANM	ARBORS OF LAKE HARRIS INC.	0.095	LAKE HARRIS	8/28/1995
42-069-0591N	ARBORS OF LAKE HARRIS, INC.	0.090	LAKE HARRIS	8/ 9/1995
42-069-0597AN	BARNETT BANK OF LAKE COUNTY C/O JERRY {B 1711 N. CITRUS BLVD. LEESBURG FL ,32748	0.020	LAKE GRIFFIN	7/24/1995
42-069-0602ANG	LAKE COUNTY BOARD OF PUBLIC IN 210 W. BURLEIGH BLVD. TAVARES FL ,32778	0.770	GROUND WATER	8/21/1995
42-069-0606AN	EARLE STOCKWELL 2722 WESTSIDE DR. LEESBURG FL ,34748	2.040	UNNAMED POND	8/23/1995
42-069-0606ANM	EARLE STOCKWELL 2722 WESTSIDE DRIVE LEESBURG FL ,34748	1.090	GROUNDWATER	1/31/1996

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42-069-0606ANM2	EARL STOCKWELL 2722 WESTSIDE DRIVE LEESBURG FL ,34748	0.920	LAKE DENHAM	6/ 8/1997
42-069-0606ANM3	EARL STOCKWELL 2722 WESTSIDE DRIVE LEESBURG FL ,34748	0.830	LAKE DENHAM	6/29/1997
42-069-0606ANM4	EARL STOCKWELL 2722 WESTSIDE DRIVE LEESBURG FL ,34748	1.916	UNNAMED WATER BODY	4/26/1998
42-069-0610ANG	CITY OF LEESBURG P.O. BOX 490630 LEESBURG FL ,34749	3.320	GROUNDWATER	8/ 6/1995
42-069-0612AN	JAMES GREGG P.O. BOX 491730 LEESBURG FL ,34749	21.030	LAKE SUNSET	9/ 6/1995
42-069-06140AN	DISCOUNT AUTO PARTS INC.	0.630	LAKE SUNNYSIDE	8/ 9/1995
42-069-0615AN	QUALITY PETROLEUM C/O RALPH WEEKS P.O. BOX 3889 LAKELAND FL ,33802	0.285	LAKE HARRIS	8/14/1995
42-069-0616AN	HENRY J. RICHTER P.O. BOX 1244 MT. DORA FL ,32757	1.580	GROUNDWATER	8/30/1995
42-069-0616ANM	FAMILY HEALTH CENTER 17580 HIGHWAY 41 WEST MT. DORA FL ,32757	1.580	LAKE GERTRUDE	9/22/1998
42-069-0619AN	SCOTTY'S INC. P.O. BOX 939 WINTER HAVEN FL ,33882	5.200	LAKE GRIFFIN	8/21/1995
42-069-0621AN	MCDONALD'S CORP. 4830 W. KENNEDY BLVD. SUITE 395 TAMPA FL ,33609	0.900	GROUNDWATER	8/28/1995
42-069-0622AN	JACK DRAWDY 4021 PALM DRIVE LEESBURG FL ,34748	0.600	LAKE HARRIS	8/28/1995
42-069-0628AN	CHARTER BUILDERS P.O. BOX 1549 MT. DORA FL ,32757	0.360	LAKE DORA	9/20/1995
42-069-0633AN	BOB BARTH 4590 NORTH HWY. 19-A MOUNT DORA FL ,32757	8.690	LAKE SAUNDERS	10/23/1995
42-069-0639AN	COCA COLA FOODS 11 CLOUD STREET P.O. BOX 728 LEESBURG FL ,32748	4.480	LAKE HARRIS	1/24/1996
42-069-0639ANM	COCA COLA FOODS P. O. BOX 2079 2000 ST. JAMES PLACE HOUSTON TX ,77056	3.100	LAKE HARRIS	1/13/1998
42-069-0640AN	CITY OF LEESBURG	1.550	LAKE EUSTIS	11/20/1995
42-069-0641AN	CITY OF EUSTIS 8 N GROVE STREET EUSTIS FL ,32727	0.400	GROUNDWATER	11/20/1995
42-069-0642AN	JOE SWIRDERSIKI 9501 SILVER LAKE DR. LEESBURG FL ,34788	18.500	LAKE GRIFFIN	3/12/1996
42-069-0642ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES , FL ,32778	0.000		/ /

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APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-069-0645AN	CENTRAL FLORIDA INVESTMENT 9115 BROWN DEER ROAD SAN DIEGO CA ,92121	3.670	GROUNDWATER	1/29/1996
42-069-0650AN	CHARLES AND NANCY SIMANOSKI	0.286	LAKE SAUNDERS	1/17/1996
42-069-0654AN	GROVER REIFLER P.O. BOX 914 LEESBURG FL ,34749	0.000		/ /
42-069-0666ANG	LAKE COUNTY BOARD OF CO. COMMI 315 WEST MAIN STR TAVARES FL ,32778	1.390	LAKE EUSTIS	1/17/1996
42-069-0667AN	MCLEOD-ROJAS PROPERTIES 216 NORTH 3RD STREET LEESBURG FL ,34748	0.000		/ /
42-069-0667ANM	JOHN MCLEOD & MANNY ROJAS 10041 US HWY. 441 LEESBURG FL ,34788	0.780	LAKE HARRIS	7/10/1997
42-069-0669AN	SCHOOL BOARD OF LAKE COUNTY FL 518 WEST ALFRED STREET TAVARES FL ,32778	15.000	GROUNDWATER	4/18/1996
42-069-0669ANGM	LAKE COUNTY SCHOOL BOARD 518 W. ALFRED STREET TAVARES FL ,32778	0.350	UN-NAMED POND	10/22/1996
42-069-0674AN	KEITH MILES 2609 CRESANT LAKE COURT WINDERMERE FL ,34786	31.900	LAKE FRANCES	5/16/1996
42-069-0675ANG	LAKE SUMTER COMMUNITY COLLEGE	0.220	SILVER LAKE	5/ 7/1996
42-069-0679ANG	CITY OF EUSTIS P O DRAWER 68 EUSTIS FL ,32727	4.000	LAKE WILLIE	5/29/1996
42-069-0681AN	HUGHES & BUTTERWORTH 2545 SOUTH STREET LEESBURG FL ,34748	0.190	GROUNDWATER	5/13/1996
42-069-0682AN	DR. WILLIAM LARRY HENDRY 32815 RADIO ROAD LEESBURG FL ,34788	0.950	GROUNDWATER	6/12/1996
42-069-0684AN	NEW COVENANT WORSHIP CENTER P O BOX 159 FRUITLAND PARK FL ,34731	3.340	GROUNDWATER	6/12/1996
42-069-0684ANM	NEW COVENANT WORSHIP CENTER P. O. BOX 159 706 URICK ST. FRUITLAND PARK FL ,34731	15.660	CRYSTAL LAKE	4/22/1999
42-069-0686AN	SOUTHERNAIRE MOBILE HOME PARK 1700 SANFORD ROAD MOUNT DORA FL ,32757	1.200	LAKE DORA	11/27/1996
42-069-0689AN	FLORIDA LUMBER & BUILDING MATE 905 LEE ROAD ORLANDO FL ,32810	1.090	LAKE DORA	8/27/1996
42-069-0690AN	FLORIDA UNITED METHODIST YOUTH P. O. BOX 3767 LAKELAND FL ,33802	4.000	RETENTION AND SWALES	7/23/1996
42-069-0690ANM	FLORIDA UNITED METHODIST YOUTH P. O. BOX 3767 LAKELAND FL ,33802	5.520	LAKE GRIFFIN	3/25/1997
42-069-0693AN	LAKE COUNTY CABLEVISION 1310 MARION STREET P. O. BOX 490919 LEESBURG FL ,	1.710	SILVER LAKE	9/24/1996

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42-069-0694AN	EXXON CORPORATION P. O. BOX 1929 OVIEDO FL ,32765	1.148	LAKE GERTRUDE	7/18/1996
42-069-0698AN	DR. MADIEY F. LAWINDY 609 W. DIXIE AVENUE LEESBURG FL ,34748	0.400	LAKE GRIFFIN	8/15/1996
42-069-0700AN	NANCY PRUITT P. O. BOX 1126 TAVARES FL ,32778	0.680	LAKE DORA	8/27/1996
42-069-0701AN	DR. JOSEPH G. SAHAB 914 E. DIXIE AVENUE LEESBURG FL ,34748	0.888	LAKE HARRIS	9/ 9/1996
42-069-0705AN	DR. JOSEPH M. UNANUE 1020 N. BOULEVARD E. LEESBURG FL ,34748	0.748	LAKE GRIFFIN	10/15/1996
42-069-0708ANG	CITY OF MOUNT DORA 510 BAKER STREET MOUNT DORA FL ,32757	2.600	LAKE FRANKLIN	10/22/1996
42-069-0709ANG	LAKE COUNTY SCHOOL BOARD 518 W. ALFRED STREET TAVARES FL ,32778	0.550	LAKE GRIFFIN	11/19/1996
42-069-0714AN	BEVERLY CALIFORNIA CORPORATION 3050 BROWN AVENUE MOUNT DORA FL ,32757	1.300	LAKE DORA	4/27/1997
42-069-0716AN	CHARLIE JOHNSON BUILDER, INC. 510 W HIGHWAY 441 MOUNT DORA FL ,32757	0.890	LAKE GERTRUDE	12/18/1996
42-069-0720AN	ST. MARY OF THE LAKES CATHOLIC 234 E. BADGER AVE. EUSTIS FL ,32726	0.200	LAKE EUSTIS	1/16/1997
42-069-0724ANM	WAL-MART STORES, INC. 701 SOUTH WALTON BLVD. BENTONVILLE AK ,72716	10.290	LAKE GRIFFIN	5/17/1998
42-069-0725ANG	LAKE COUNTY SCHOOL BOARD 201 W. BURLEIGH BLVD TAVARES FL ,32778	3.000	LAKE FRANKLIN	3/27/1997
42-069-0726ANG	LAKE COUNTY SCHOOL BOARD LAKE COUNTY SCHOOL BOARD ATTN: HERMAN KICKLIGHTER TAVARES FL ,32778	3.500	TROUT LAKE AND LAKE	3/ 9/1997
42-069-0729ANG	FLORIDA DEPT. AGRICULTURE & CO DIVISION OF FORESTRY 3125 CONNER BLVD. TALLAHASSE FL ,32399	5.200	HAINES CREEK	3/ 2/1997
42-069-0731AN	DONALD HAYES AND TOMMY HAYES, 28 W WOODWARD AVE. EUSTIS FL ,32726	0.200	LAKE EUSTIS	2/26/1997
42-069-0732ANG	CITY OF MOUNT DORA 510 N BAKER ST. P. O. BOX 176 MOUNT DORA FL ,32757	0.000		/ /
42-069-0740AI	FLOYD S. DILLARD 826 N. BAY ST. EUSTIS FL ,32726	0.400	LAKE EUSTIS	7/15/1997
42-069-0747ANG	FL DEPT. OF AGRICULTURE AND CO DIVISION OF FORESTRY 3125 CONNER BLVD. TALLAHASSEE FL ,32399	0.000	HAINES CREEK (CLASS	/ /

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42-069-0753ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	3.490	LAKE GRIFFIN	4/ 3/1997
42-069-0753ANGM	LAKE COUNTY PUBLIC SERVICES 123 N. SINCLAIR AVE. TAVARES FL ,32778	3.839	LAKE GRIFFIN	4/29/1999
42-069-0756ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	3.200	LAKE FRANCIS	4/ 8/1997
42-069-0758AN	GARY D. JOHNSON P. O. BOX 244 LADY LAKE FL ,32159	0.960	LAKE SAUNDERS	4/27/1997
42-069-0761AN	PEOPLE'S GAS SYSTEM, INC. 1724 KURT ST. EUSTIS FL ,32726	0.500	LAKE EUSTIS	4/13/1997
42-069-0762ANG	THE SCHOOL BOARD OF LAKE COUNT 201 W. BURLEIGH BLVD. TAVARES FL ,32778	3.900	LAKE EUSTIS, INDIREC	4/20/1997
42-069-0764AN	LAKE COUNTY BAPTIST ASSOCIATIO 29305 C.R. 561 TAVARES FL ,32778	2.160	LAKE DORA	5/13/1997
42-069-0765AN	MARVIN O. SMALLWOOD	10.020	CRYSTAL LAKE = CLASS	/ /
42-069-0766AN	BOB GREEN 504 BANNING BEACH RD. TAVARES FL ,32778	0.137	LAKE EUSTIS	4/29/1997
42-069-0767AN	EUSTIS, FL CONGREGATION OF JEH 717 N. EUSTIS ST. EUSTIS FL ,32726	0.810	LAKE JOANNA	6/17/1997
42-069-0769AN	BOB SIMPSON P.O. BOX 21 MOUNT DORA	7.070	LAKE DORA	7/17/1997
42-069-0772AN	DENISE COUNT P.O. BOX 897514 LEESBURG FL ,34788	1.120	HAINES CREEK	7/29/1992
42-069-0774AN	JAMES A. GLISSON 27 E. PINEHURST BLVD. EUSTIS FL ,32726	3.090	LAKE HERMOSA	6/ 3/1992
42-069-0775AN	BRD OF TRUSTEES/FL ANNUAL CONF UNITED METHODIST CHURCH P. O. BOX 3767 LAKELAND FL ,33802	1.550	LAKE GRIFFIN	6/15/1997
42-069-0782AN	FRANK EZELL, JR. 600 CASCADE AVE. LEESBURG FL ,34748	0.610	OLD BORROW PIT	8/14/1997
42-069-0783AN	CLAUDIA RAMSEY 401 THOMAS ST. FRUITLAND PARK FL ,34731	1.100	LAKE GRIFFIN	7/27/1997
42-069-0783ANM	CLAUDIA RAMSEY 401 THOMAS ST. FRUITLAND PARK FL ,34731	1.280	LAKE GRIFFIN	7/ 2/1998
42-069-0790AN	GRINER'S A-1 PIPELINE SERVICE 21902 S.R. 46 MOUNT DORA FL ,32757	1.130	UNNAMED POND	8/14/1997
42-069-0792AN	FLORIDA POWER CORPORATION 3201 THIRTY-FOURTH ST. S. P. O. BOX 14042 ST. PETERSBURG FL ,33733	3.450	UNNAMED LAKE TO SOUT	7/24/1997
42-069-0793AN	ASBURY COVENANT CHURCH 1100 ST. CLAIR ABRAMS AVE P. O. BOX 1043 TAVARES FL ,32778	0.890	LAKE EUSTIS	8/21/1997

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42-069-0794AN	PERRY R. GIBSON 10105 DORSET DRIVE LEESBURG FL ,34788	2.600	LAKE HARRIS	8/31/1997
42-069-0799AN	CAPITAL IMPROVEMENT OF LAKE CO ATTN: MIKE ANDERSON BLOXHAM AVENUE TAVARES FL ,32778	1.100		/ /
42-069-0800AN	ROY J. BROGAN JR. & ROSELEA R. DILLARD ROAD EUSTIS FL ,32726	1.900	LAKE EUSTIS	8/31/1997
42-069-0802AN	FIRST UNITED METHODIST CHURCH	0.430	LAKE DORA	10/21/1997
42-069-0804ANG	CITY OF TAVARES 100 E. CAROLINE ST. TAVARES FL ,32778	1.640	LAKE DORA	10/30/1997
42-069-0808AN	LEESBURG REGIONAL MEDICAL CENT 600 EAST DIXIE AVENUE LEESBURG FL ,34748	0.930	LAKE HARRIS	12/ 2/1997
42-069-0814AN	TOWN AND COUNTRY REFUSE P. O. BOX 548 FRUITLAND PARK FL ,34731	2.170	ROBINSON LAKE	11/10/1997
42-069-0823AN	CONDEV PROPERTIES 2487 ALOMA AVE. WINTER PARK FL ,32792	0.478	LAKE EUSTIS	12/21/1997
42-069-0825ANG	LAKE COUNTY WATER AUTHORITY 107 N. LAKE AVENUE TAVARES FL ,32778	1.380	WOLF BRANCH SINK	2/18/1998
42-069-0826ANG	CITY OF EUSTIS P. O. DRAWER 68 EUSTIS FL ,32727	0.800	LAKE EUSTIS	12/ 9/1997
42-069-0828AN	BILL BAKER/WALT HOLDEN 2155 U.S. NEW HWY 441 W. MOUNT DORA FL ,32757	1.360	LAKE LOUISE	2/17/1998
42-069-0829ANG	CITY OF EUSTIS P. O. DRAWER 68 EUSTIS FL ,32727	0.720	LAKE WILLIE	1/ 8/1998
42-069-0831AN	NEW LIFE PRESBYTERIAN CHURCH 201 LA VISTA ST. FRUITLAND PARK FL ,34731	7.970	LAKE GRIFFIN STATE P	2/11/1998
42-069-0832AN	SOUTH LEESBURG CHURCH OF GOD 2340 SOUTH STREET LEESBURG FL ,34787	1.717	LAKE DYCUS	1/11/1998
42-069-0837ANG	CITY OF MOUNT DORA, FLORIDA 1250 N. HIGHLAND ST. MOUNT DORA FL ,32757	0.340	LAKE FRANKLIN	1/20/1998
42-069-0838AN	GEORGE O. PRINGLE 26600 ACE AVENUE LEESBURG FL ,34748	5.150	LAKE HARRIS	1/22/1998
42-069-0841AN	SHANGRI-LA BY THE LAKE, INC. 100 SHANGRI-LA BLVD. LEESBURG FL ,32788	9.300		/ /
42-069-0846AN	NEW HOPE PRESBYTERIAN CHURCH 612 BAY ST. EUSTIS FL ,	9.100	LAKE JOANNA	3/ 3/1998
42-069-0847ANG	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	4.040		/ /
42-069-0848AN	BARNETT BANK OF LAKE COUNTY, N 100 N. BAY ST. EUSTIS FL ,32726	2.880	UNNAMED LAKE	4/ 7/1998

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42-069-0850AN	DOMINIQUE & JANET DEPAZ 1606 FAHNSTOCK STREET EUSTIS FL ,32726	0.393	LAKE DENHAM	3/17/1998
42-069-0851AN	JOHN D. & SHERRY S. MCLEOD P. O. BOX 885007 LEESBURG FL ,32788	16.000	GROUND WATER	/ /
42-069-0853ANG	FLORIDA DEPARTMENT OF TRANSPOR 719 S. WOODLAND BLVD. DELAND FL ,32720	18.220	DRAINAGE DITCH, CLAS	/ /
42-069-0858AN	WHITE ROSE HOLDINGS, INC. 34135 CARDINAL LANE EUSTIS FL ,32726	4.600	LAKE INDIANOLA	6/ 9/1998
42-069-0858ANM	JOHN R. PRICKETT	0.890	LAKE INDIANOLA	11/17/1998
42-069-0859AN	THE CANOPY AT LAKE GRIFFIN, IN 800 NEWELL HILL RD. LEESBURG FL ,34748	9.950	LAKE GRIFFIN	7/ 9/1998
42-069-0863AN	ABSOLUTE DEVELOPMENT CORP. 6781 ULMERTON RD. LARGO FL ,34641	0.497	LAKE GRIFFIN	7/26/1998
42-069-0863ANM	ABSOLUTE DEVELOPMENT CORP.	0.744		4/13/1999
42-069-0871AN	MT. ZION BAPTIST CHURCH 9605 C. R. 44 LEESBURG FL ,34788	1.660	UNNAMED POND	8/ 9/1998
42-069-0872AN	THE FIRST BAPTIST CHURCH OF EU 719 E. ORANGE AVE. EUSTIS FL ,32726	23.000	BLUE LAKE & LAKE SUL	11/22/1998
42-069-0874AN	JOHN C. MALIK, SR. 8121 W. OGDEN AVE. LYONS IL ,60534	0.570	LAKE GRIFFIN	7/26/1998
42-069-0875AN	C.C. & B PARTNERSHIP 131 W. MAIN ST. TAVARES FL ,32778	12.420	LAKE GRIFFIN, CLASS	/ /
42-069-0876AN	FIRST BAPTIST CHURCH OF LEESBU 220 N. 13TH ST. LEESBURG FL ,34748	1.200	POND	7/ 2/1998
42-069-0877AN	MICHAEL C. NORVELL P. O. BOX 491615 LEESBURG FL ,34749	0.330	LAKE HARRIS	7/ 2/1998
42-069-0878AN	FRUITLAND ACRES OF FRUITLAND P 8380 BAYMEADOWS ROAD SUITE 14 JACKSONVILLE FL ,32256	6.000	MYRTLE LAKE	8/25/1998
42-069-0881AN	DIOCESE OF ORLANDO P.O. BOX 1800 ORLANDO FL ,32802	0.900	LAKE GRIFFIN	7/28/1998
42-069-0883AN	RILEY CONSTRUCTION, INC. 1216 MT. HOMER RD. EUTIS FL ,32726	3.020	LAKE DORA	7/16/1998
42-069-0884ANG	FLORIDA DEPT. OF TRANSPORTATIO 719 SO WOODLAND BOULEVARD DELAND FL ,32720	23.800	LAKE HARRIS	9/ 7/1998
42-069-0885ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	1.090	LAKE HARRIS	9/ 1/1998
42-069-0890AN	GARY WARD 9934 U.S. HWY. 441 LEESBURG FL ,34788	0.679	LAKE HARRIS	9/ 8/1998

Permits for Stormwater

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-069-0895AN	ED HAVILL POST OFFICE BOX 1027 TAVARES FL ,32778	0.390	LAKE OF THE WOODS	8/20/1998
42-069-0896AN	LEESBURG REGIONAL MEDICAL CENT 600 E. DIXIE AVE. LEESBURG FL ,34748	0.310	LAKE GRIFFIN	8/25/1998
42-069-0900AN	MICHAEL RINCK 1728 KELLY PARK RD. APOPKA FL ,32712	9.010	LAKE LINCOLN	9/27/1998
42-069-0902AN	J. W. BROOKS, INC. 41505 SILVER DRIVE UMATILLA FL ,32784	0.200	LAKE SAUNDERS	10/ 6/1998
42-069-0905AN	DR. JEFFREY D. BAUMANN 17560 HWY 441 MT. DORA FL ,32757	1.140	LAKE GRIFFIN	11/12/1998
42-069-0906AN	EUSTIS ELKS # 1578 POST OFFICE BOX 1660 EUSTIS FL ,32726	4.310	LAKE SAUNDERS	10/18/1998
42-069-0907ANG	CITY OF MOUNT DORA POST OFFICE BOX 176 MOUNT DORA FL ,32757	0.686	LAKE JOHN	10/11/1998
42-069-0909AN	FIRST BAPTIST CHURCH OF TAVARE 124 NORTH JOANNA AVENUE TAVARES FL ,32778	0.640	LAKE DORA	10/29/1998
42-069-0910AN	ROGER CONNER, III ROUTE 1, BOX 117 MOUNT DORA FL ,32757	0.298	LAKE DORA	11/23/1998
42-069-0911AN	LAKE COMMUNITY ACTION AGENCY, 501 NORTH BAY ST. EUSTIS FL ,32726	1.200	ROBINSON LAKE	11/ 3/1998
42-069-0912AN	STOLLER CHEMICAL CO. OF FLORID P. O. BOX 1227 1451 PINE GROVE RD. EUSTIS FL ,32727	0.240	LAKE EUSTIS	11/12/1998
42-069-0913AN	DR. V. DALE MEEKS 2250 S. BAY ST. EUSTIS FL ,32726	1.370	LAKE SAUNDERS	11/23/1998
42-069-0916AN	DR. GARY K. STOLTZ 1106 S. BAY ST. EUSTIS FL ,32726	1.150	LAKE EUSTIS	12/ 6/1998
42-069-0918AN	CITY OF TAVARES 100 E. CAROLINE ST. TAVARES FL ,32778	0.580	LAKE DORA	11/19/1998
42-069-0921AN	FLORIDA REGIONAL EMERGENCY MED 2610 S. ST. LEESBURG FL ,34748	3.600	LAKE HARRIS	1/28/1999
42-069-0923AN	M.M.C. PROPERTIES 33003 CARL COURT LEESBURG FL ,34788	0.886	LAKE EUSTIS	12/14/1998
42-069-0926AN	ROBERT J. HESTER 4964 S. ORANGE AVE. ORLANDO FL ,32809	2.100	LAKE SAUNDERS	1/21/1999
42-069-0931ANG	LAKE COUNTY BOARD OF COUNTY CO P. O. BOX 7800 315 W. MAIN ST. TAVARES FL ,32778	8.500	LAKE DORA	2/ 5/1999
42-069-0938AN	CHARLENE NELSON RT. 3, BOX 233A APEX NC ,27502	2.920	LAKE HOLLYWOOD	3/ 7/1999

Permits for Stormwater

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-069-0940AN	SCOTTY'S INC. C/O RICHARD FLORA P. O. BOX 939 WINTER HAVEN FL ,33882	3.150	LAKE SAUNDERS	3/ 7/1999
42-069-0942ANG	LAKE SUMTER COMMUNITY COLLEGE 9501 U.S. HWY. 441 LEESBURG FL ,34788	2.100	SILVER LAKE	3/ 1/1999
42-069-0942ANGM	LAKE SUMTER COMMUNITY COLLEGE 9501 U.S. HIGHWAY 441 LEESBURG FL ,34788	4.080	N/A	4/13/1999
42-069-0944AN	BROWN & WOODWORTH LAND TRUST P. O. BOX 921 EUSTIS FL ,32727	15.700	LAKE NETTIE	4/22/1999
42-069-0946AN	B & B PROPERTIES 33725 LAKESHORE DR. TAVARES FL ,32778	9.400	WATER RETENTION AREA	/ /
42-069-0947ANG	CITY OF LEESBURG P. O. BOX 490630 600 W. ORANGE ST. LEESBURG FL ,34749	4.800	UN-NAMED LAKE	4/18/1999
42-069-0950AN	JOHN MCLEOD P. O. BOX 895007 LEESBURG FL ,34789	0.920	LAKE GRIFFIN	4/25/1999
42-069-0953AN	ABSOLUTE DEVELOPMENT CORP	0.744	N/A	/ /
42-069-0956AN	DAYTON SANDHOLM-FIFTY FIVE, IN 1601 DORSET DRIVE MT. DORA FL ,32757	11.980	LAKE ELSIE	5/23/1999
42-069-0959AN	GENE BAUGH 506 S. CENTER ST. EUSTIS FL ,32726	6.050	LAKE ELSIE	6/15/1999
42-069-0965AN	LIBERTY BAPTIST CHURCH 15331 DORA AVENUE TAVARES FL ,32778	1.700	N/A	/ /
42-069-0967AN	DAVID CAMPIONE POST OFFICE BOX 926 EUSTIS FL ,32727	0.919	LAKE EUSTIS	5/25/1999
42-069-0969AN	GEORGE B. TREADWAY 111 WEBER AVE. LEESBURG FL ,34748	0.892	ROBINSON LAKE	6/17/1999
42-069-0970AN	REORGANIZED CHURCH OF JESUS CH 664 RAINBOW BOULEVARD LADY LAKE FL ,32159	2.060	LAKE SAUNDERS	6/ 3/1999
42-069-0972AN	DR. JEFFREY D. BAUMANN 17560 W. HIGHWAY 441 MT. DORA FL ,32757	0.550	800 OVERLAND FLOW TO	/ /
42-069-0974AN	CARVER HEIGHTS CHURCH OF GOD 2001 JOHN AVE. LEESBURG FL ,34748	0.550	WATER RETENTION AREA	/ /
42-069-0975AN	UNITED SOUTHERN BANK 2701 S. BAY ST. EUSTIS FL ,32726	0.755	LAKE EUSTIS, CLASS I	/ /
42-095-0501ANG	LAKE COUNTY BOARD OF COUNTY CO	0.000		/ /
42-069-0034AN	G.S. PROPERTIES	19.300	CANAL	11/ 5/1991
42-069-0053ANG	DIVISION OF HIGHWAY SAFETY	2.870	ROADSIDE SWALE	11/17/1991
42-069-0058AN	BILL C. WATTS/CUSTOM SHUTTERS	4.063	UN-NAMED POND	11/ 5/1991
42-069-0091AN	LAKEWOOD DEV PARTNERSHIP	27.000		2/10/1992
42-069-0109ANG	LAKE COUNTY BOARD OF CNTY COMM	26.000		3/ 9/1992

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APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-069-0143ANG	LAKE COUNTY BOARD OF CNTY COMM	1.300		5/21/1992
42-069-0168ANG	LAKE COUNTY BOARD OF CNTY COMM	1.500		6/17/1992
42-069-0199ANG	LAKE COUNTY BD OF CNTY COMM 315 WEST MAIN STREET TAVARES FL ,32778	0.640	NONE	1/15/1993
42-069-0216AN	BILLY & RUBY BREWER P.O. BOX 301 ZELLWOOD FL ,32798	3.200		11/24/1992
42-069-0233AN	MICHAEL TUBBS	11.200	LAKE IDAMERE	12/30/1992
42-069-0242AN	SILVER SPRINGS CITRUS CO-OP P. O. BOX 155 HOWEY-IN-HILLS FL ,34737	1.000		1/28/1993
42-069-0242ANM	SILVER SPRINGS CITRUS COOPERAT P. O. BOX 155 HOWEY-IN-HILLS FL ,34737	3.200	UNNAMED DITCH	8/19/1993
42-069-0252AN	GLEN TYRE 2500 S BAY STREET EUSTIS FL ,32726	30.020	LAKE HARRIS	1/28/1993
42-069-0285AN	THOMAS W. MCANALLY P. O. BOX 388 TAVARES FL ,32778	5.200		6/ 1/1993
42-069-0314AN	QUALTOOL, INC. 803 SWEETWATER BLVD S LONGWOOD FL ,32779	7.580	NONE	7/ 5/1993
42-069-0436AN	HARRIS W. HUDSON 825 NW 31ST AVENUE FT. LAUDERDALE FL ,33311	1.600		5/ 4/1994
42-069-0442AN	MT. OLIVE BAPTIST CHURCH ATTN: LEVI NELSON P.O. BOX 115 OKAHUMPKA FL ,34762	0.506	NONE	4/28/1994
42-069-0442ANM	MT. OLIVE BAPTIST CHURCH P. O. BOX 115 OKAHUMPKA FL ,32762	0.600	GROUNDWATER	2/26/1996
42-069-0444ANG	LAKE COUNTY FLORIDA BOARD OF C ATTN: JIM STIVENDER 315 WEST MAIN ST. TAVARES FL ,32778	0.000	LAKE HARRIS	/ /
42-069-0446AN	JOE AND FRANK EGER ATTN: SIERRA LUMBER CO. P.O. BOX 6216 STOCKTON CA ,95206	32.250	LITTLE LAKE HARRIS	5/15/1994
42-069-0465ANG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	13.700		6/28/1994
42-069-0465ANMG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL ,32778	0.000		10/20/1994
42-069-0493AN	MISSION INN P.O. BOX 441 HOWEY IN HILLS FL ,32737	4.350		/ /
42-069-0506AN	LAKEWOOD DEVELOPMENT PARTNERSH 25200 U.S. HIGHWAY 27 S LEESBURG FL ,32748	5.580		/ /
42-069-0514AN	A. DUDA & SONS INC. P.O. BOX 257 OVIEDO FL ,32765	7.980	ON-SITE POND	3/16/1990
42-069-0528AN	HOWARD HEWITT P.O. BOX 490570 LEESBURG FL ,34749	5.000	GROUNDWATER	1/15/1995

Permits for Stormwater

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-069-0546AN	DON J. DAVIS & KATHY M. DAVIS 512 NORTH LAKE STREET CRESCENT CITY FL ,32112	1.240	LAKE IDAMERE	12/21/1989
42-069-0582AN	MISSION INN P. O. BOX 331 HOWEY HILLS FL ,34737	0.000		/ /
42-069-0593AN	LAKE COUNTY SCHOOL BOARD 518 W. ALFRED STREET TAVARES FL ,32778	1.000	GROUND WATER	8/23/1995
42-069-0593ANGM	LAKE COUNTY SCHOOL BOARD ATTN: HERMAN KICKLIGHTER 518 W. ALFRED STREET TAVARES FL ,32778	1.000	GROUNDWATER	2/12/1996
42-069-0604AN	HOSPICE OF LAKE AND SUMTER INC	5.350	LAKE IDAMERE	7/19/1995
42-069-0634AN	ALLEN KELLEY AND CLIFFORD COOK P.O. BOX 292004 LEESBURG FL ,34749	4.980	PALATLAKAHA RIVER	11/27/1995
42-069-0635AN	CLIFFORD COOK 27400 U.S. HWY. 27 LEESBURG FL ,34748	0.000		/ /
42-069-0663AN	AUCLAIR PROPERTIES 431 DONNELLY STREET MOUNT DORA FL ,32757	4.850	LAKE CARLTON	4/ 1/1996
42-069-0665ANG	LAKE CO. BOARD OF CO. COMMISSI ATTN: DONALD GRIFFEY 315 WEST MAIN ST TAVARES FL ,32778	1.120	DILLY MARCH	1/17/1996
42-069-0730ANG	LAKE COUNTY SCHOOL BOARD 518 W. ALFRED ST. TAVARES FL ,32778	19.540	LAKE IDAMERE	2/11/1997
42-069-0734ANG	LAKE COUNTY SCHOOL BOARD 518 W ALFRED ST. TAVARES FL ,32778	22.400	LITTLE LAKE HARRIS	3/30/1997
42-069-0743ANG	CITY OF TAVARES 100 E CAROLINE ST. TAVARES FL ,32778	5.660	LAKE DORA	3/23/1997
42-069-0749AN	MACK PRECAST CORP. ATTN: RICHARD W. MACK POB 157, 1001 HWY 561 S. ASTATULA FL ,32705	16.460	LITTLE LAKE HARRIS	4/13/1997
42-069-0757AN	CARLIN WASHO 900 N. LAKE SHORE BLVD. HOWEY-IN-HILLS FL ,34737	0.290	LITTLE LAKE HARRIS	4/ 8/1997
42-069-0760AN	EDUARDO DIAZ 24920 PINEHILL LEESBURG FL ,34740	2.890	DILLY MARSH	4/13/1997
42-069-0777AN	DEWEY BURNSED P. O. BOX 491357 LEESBURG FL ,34749	25.500	LAKE HARRIS	8/ 3/1997
42-069-0789AN	HAWTHORNE RESIDENTS COOPERATIV P. O. BOX 491700 LEESBURG FL ,34749	0.800	LAKE HARRIS	9/30/1997
42-069-0801AI	GARY EULETT	33.000	GROUND WATER	12/16/1998
42-069-0836ANG	LAKE COUNTY	2.410	LAKE HARRIS	2/11/1998
42-069-0854AN	TOWN OF HOWEY-IN-THE-HILLS P. O. BOX 67 HOWEY I T HILLS FL ,34737	0.960	UNNAMED WATER BODY-D	3/24/1998

Permits for Stormwater

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-069-0865AN	CLARK SALES DISPLAY INC. 28732 TAMMI DRIVE TAVARES FL ,32778	2.880	UNNAMED DEPRESSIONAL	6/25/1998
42-069-0866AN	KIM SECHLER, GELANDER INDUSTRI ATTN: KIM SECHLER 3711 ROGERS INDUST. PK RD OKAHUMPKA FL ,34762	0.000	UNNAMED WATERBODY	7/12/1998
42-069-0867ANG	LAKE COUNTY BROAD OF COUNTY CO 315 W. MAIN ST. TAVARES FL ,32778	3.000	APOPKA LAKE BEAUCLAI	6/14/1998
42-069-0880AN	DENNIS A. SERINE 8805 BAYHILL BLVD. ORLANDO FL ,32819	2.110	SERINE RANCH HORSE B	10/22/1998
42-069-0922AN	M & N LEASING, INC. P. O BOX 441 HOWEYINTHEHILLS FL ,34737	0.280	LITTLE LAKE HARRIS	12/10/1998
42-069-0927ANG	NAVAL RESEARCH LABORATORY 4555 OVERLOOK AVE. S.W. WASHINGTON DC ,20375	0.650	BUGG SPRING	2/17/1999
42-069-0935AN	ST. MARK LUTHERAN CHURCH ATTN: CLIFF KELLOGG 28215 S. HWY. 27 LEESBURG FL ,34748	4.000	HELENA RUN	3/18/1999
42-069-0941AN	GUENTER HEROLD, ET AL 27113 ROBERTSON RD. YALAHA FL ,34797	3.970	LAKE HARRIS	4/22/1999
42-095-0863AN	LAKE OLA BAPTIST CHURCH 6551 SADLER AVENUE ZELLWOOD FL ,32798	0.100	LAKE OLA	8/21/1995
42-095-1005AN	DIOCESE OF ORLANDO 421 E. ROBINSON ST. ORLANDO FL ,32802	6.000	N/A	3/14/1996
42-095-1122AN	HAMPDEN DU BOE ACADEMY P O BOX 639 ZELLWOOD FL ,32798	0.294	LAKE CARLTON	11/12/1996
42-009-0452ANGM	BREVARD COUNTY BOARD OF COUNTY P.O, BOX 1496 TITUSVILLE FL ,32781	0.960	ST. JOHNS RIVER	8/17/1994
42-069-0111AN	MR & MRS WILLIAM STROSBERG	21.646		/ /
42-069-0111ANF	DEWITT EXCAVATING, INC. P. O. BOX 770337 WINTER GARDEN FL ,34777	21.650	UNNAMED WETLANDS TO	4/25/1999
42-069-0149AN	HI-ACRES, INC.	80.000	LITTLE LAKE HARRIS	6/29/1992
42-069-0169ANG	LAKE COUNTY BOARD OF CNTY COMM	30.000		6/17/1992
42-069-0304AN	LAFAYETTE VINEYARDS ATTN: GARY COX RT 7 BOX 481 TALLAHASSEE FL ,32308	10.000		6/13/1993
42-069-0369AN	KATHLEEN DVORAK 1422 PAULA DRIVE APOPKA FL ,32803	20.240	SHEPHERD LAKE	3/31/1994
42-069-0404AN	NOVELTY CRYSTAL CORPORATION ATTN: JOSEPH MICHAELI 79-55 ALBION AVENUE ELMHURST NY ,11373	18.600	NONE	3/14/1994
42-069-0456AN	ARNOLD STROSHEIN 10559 SPICEWOOD TRAIL BOYNTON BEACH FL ,33436	94.000	LAKE APOPKA	/ /

Permits for Stormwater

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
42-069-0696ANG	F.D.O.T. FLORIDA'S TURNPIKE 605 SUWANNEE STREET TALLAHASSEE FL ,32399	18.200	DILLY LAKE	9/ 3/1996
42-069-0861AN	ARMANDO F. ALONZO 1532 EAST MAIN ST. LEESBURG FL ,34748	4.600	SCHOOLHOUSE LAKE	6/23/1998
42-069-0893AN	WATER SERVICES, INC. 7008 FOREST CITY RD. ORLANDO FL ,32810	1.150	MONTGOMERY LKE	8/13/1998
42-069-0894AN	SOUTHERN NATURALS P. O. BOX 579 PLYMOUTH FL ,32768	0.900	UNNAMED LAKE	10/ 6/1998
42-069-0954AN	ROBERT DELLO RUSSO P. O. BOX 520522 LAKE MARY FL ,32752	3.880	MONTGOMERY LAKE	/ /
42-069-0963AN	CARROLL FULMER & CO., INC. P. O. BOX 616300 ORLANDO FL ,32861	16.540	UNNAMED LAKE, CLASS	/ /

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
4-061-0261AG	FLORIDA DEPARTMENT OF TRANSPOR ATTN: BOB GLEASON 719 SOUTH WOODLAND BOULEVARD DELAND FL , 32720	27.600	LAKE GRIFFIN	/ /
4-069-0008	L.F.C., INC. P.O. BOX 834 LEESBURG FL , 34748	40.000		9/11/1984
4-069-0010A	PRINGLE, JOHN A. 815 TORWOODLE LANE LEESBURG FL , 34748	25.90		9/14/1985
4-069-0010AM	JOHN PRINGLE 1 SCOTTISH BLVD LEESBURG FL , 34748	14.700	EXISTING LAKES THEN	9/10/1990
4-069-0010AM2	SCOTTISH HIGHLANDS 1 SCOTTISH HIGHLANDS BLVD. LEESBURG FL , 34748	3.500	NO OFF-SITE DISCHARG	5/ 9/1994
4-069-0017A	FOX RUN, INC. 2418 S.W. 8TH DRIVE GAINESVILLE FL , 32601	17.700		11/ 9/1994
4-069-0017AE	FOX RUN, INC.	17.700	Lake Harris	11/ 9/1984
4-069-0017AEM	FOX RUN INC 1 FOX RUN BLVD TAVARES FL , 32778	12.070		8/12/1991
4-069-0017AEM2	FOX RUN, INC ATTN: HAROLD HOLLAND ONE FOX RUN BLVD. TAVARES FL , 32778	57.000	LAKE HARRIS (CLASS I	2/ 9/1993
4-069-0040A	CODDING, CHARLES RT. 1 BOX 425 MOUNT DORA FL , 32757	36.100		9/ 7/1985
4-069-0042A	MID-FLORIDA AT EUSTIS, INC	0.000		00/00/00
4-069-0043A	CODDING'S SAND & SOIL, INC STATE ROAD 19-A MT. DORA FL , 32757	0.000		00/00/00
4-069-0046A	MERLE E. NELSON P.O. BOX 316 LEESBURG FL , 34748	6.000		11/ 9/1984
4-069-0046AE	MERLE E. NELSON	6.000	LAKE HARRIS	11/ 9/1985
4-069-0053A	SUN BANK NAT ASSO./TRUSTEE P.O. BOX 8 515 W. MAIN ST. LEESBURG FL , 34748	416.000		9/ 6/1985
4-069-0053AM	DAVID KNOWLES, ET. AL. 1405 SOUTH 14TH STREET LEESBURG FL , 34748	1.540	LAKE HARRIS (CLASS I	6/ 8/1998
4-069-0053AM2	EDWARD M. SOBKO P.O. BOX 490825 LEESBURG FL , 34749	5.120	LAKE HARRIS	/ /
4-069-0054A	BUTTERFIELD, CRAIG 1700 BUENA VISTA EUSTIS FL , 32726	5.000		/ /
4-069-0056A	GRIFFIN SR. NOEL RT. 3 BOX 949 EUSTIS FL , 34786	100.000		10/11/1988
4-069-0057A	CLYDE ROGERS ET AL P.O. BOX 1656 LEESBURG FL , 34748	58.000		/ /
4-069-0060A	GREGG, JAMES R.	0.000		00/00/00
4-069-0070A	LOFLIN, JAMES P.	0.000		00/00/00
4-069-0079A	FLORIDA TWIN MARKETS, INC. P.O. BOX 939 ZELLWOOD FL , 32798	0.000		11/ 9/1985

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
4-069-0093AG	LAKE CO. BRD. OF CO. COMM. 315 W. MAIN ST. TAVARES FL , 32778	0.000		4/10/1986
4-069-0094A	INTER-COASTAL COMMUNITIES 2170 S. E. 17TH STREET SUITE 306 FT. LAUDERDALE FL , 33316	144.000		5/ 8/1986
4-069-0094AM	INTERCOASTAL COMMUNITIES ATTN: EDWARD ALLEN 1415 EAST SUNRISE BLVD #302 FT LAUDERDALE FL , 33316	1.700	NO OFFSITE DISCHARGE	12/13/1993
4-069-0104A	SUN 1ST NATIONAL BANK TRUSTEE 900 N. 14 STREET LEESBURG FL , 34749	15.100		10/ 9/1989
4-069-0106AG	LAKE COUNTY COMMISSIONERS 315 WEST MAIN STREET TAVARES FL , 32778	930.000		7/10/1989
4-069-0108AG	LAKE COUNTY COMMISSIONERS	220.000		10/ 9/1989
4-069-0109AG	LAKE COUNTY COMMISSIONERS	1,545.000		7/10/1989
4-069-0116A	JOHN D. MCLEOD P. O. BOX 1095 LEESBURG FL , 34748	0.400	The Dora Canal	/ /
4-069-0124AG	JON & JOANN JONES 1949 BRANTLEY CIRCLE CLERMONT FL , 32711	14.200		1/ 8/1990
4-069-0135AG	CITY OF LEESBURG PO BOX 630 LEESBURG FL , 34749	13.500	LAKE HARRIS	5/ 7/1990
4-069-0135AGM	CTY OF LEESBURG P.O. BOX 630 LEESBURG FL , 34748	5.000	LAKE HARRIS	3/10/1992
4-069-0135AGM2	CTY OF LEESBURG	9.000		/ /
4-069-0135AGM2Y	LEESBURG, CITY OF P.O. BOX 630 LEESBURG FL , 34748	5.800	LAKE HARRIS (CLASS I	11/15/1993
4-069-0135AGM3	CITY OF LEESBURG	18.000	LAKE HARRIS (CLASS I	2/ 7/1994
4-069-0135AGM4	CITY OF LEESBURG P.O. BOX 490630 LEESBURG FL , 347490630	3.500	LAKE HARRIS (CLASS I	5/ 8/1995
4-069-0141AG	CITY OF LEESBURG	92.170	LAKE HARRIS	8/13/1990
4-069-0146A	WILLIAM E. FLEMING	8.900		/ /
4-069-0148A	ABC FRUIT COMPANY 4964 S. ORANGE AVE ORLANDO FL , 32806	248.000	UNNAMED LAKE	10/ 8/1990
4-069-0151AC	ROBERT STETLER 3310 US 19 NORTH CLEARWATER FL , 33519	529.000	CHITTY CHATTY CREEK	10/ 8/1905
4-069-0151ACM	LEISURE COMMUNITIES, L.T.D. 146 HORIZON COURT LAKELAND FL , 33813	540.900	LAKE DENHAM	/ /
4-069-0158A	ROBERT STETLER	60.000	CHITTY-CHATTY RUN	4/ 7/1991
4-069-0158AM	ROBERT STETLER 500 WEST STATE ROAD 44 LEESBURG FL , 34748	84.100	LAKE OKAHUMPKA (CLAS	12/12/1994
4-069-0158AM2	ROBERT STETLER 500 WEST S.R. 44 LEESBURG FL , 34748	84.100	LAKE OKAHUMPKA (CLAS	8/ 6/1995
4-069-0158AM3	LEISURE COMMUNITIES, LTD 146 HORIZON COURT LAKELAND FL , 33813	10.640	LAKE ROBINSON CLASS	7/13/1998

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4-069-0158AM4	LEISURE COMMUNITIES, LTD 146 HORIZON COURT LAKELAND FL , 33813	8.700	ROBINSON LAKE (CLASS	1/11/1999
4-069-0158AM5	LEISURE COMMUNITIES, L.T.D. 146 HORIZON COURT LAKELAND FL , 33813	536.000	LAKE DEATON (CLASS I	5/10/1999
4-069-0158AM6	LEISURE COMMUNITIES, LTD. 146 HORIZON COURT LAKELAND FL , 33813	8.000		/ /
4-069-0158AM7	LEISURE COMMUNITIES, LTD 146 HORIZON COURT LAKELAND FL , 33813	4.970	LAKE DEATON	/ /
4-069-0158AM8	LEISURE COMMUNITIES, LTD. 146 HORIZON COURT LAKELAND FL , 33813	73.000	LAKE DEATON	/ /
4-069-0159A	LEON ROGERS PO BOX 406 ZELLWOOD FL , 32798	4.100	SUNSET VALLEY MARSH	/ /
4-069-0159AY	LEON RODGERS P.O. BOX 406 ZELLWOOD FL , 32798	4.100	SUNSET VALLEY MARSH	12/ 8/1992
4-069-0161A	JOHN PRINGLE	195.000	UNNAMED WETLANDS CHA	7/15/1991
4-069-0165A	CRAIG BUTTERFIELD P.O. BOX 1257 MT. DORA FL , 32757	18.000	TROUT LAKE, CLASS II	/ /
4-069-0167A	LAKE PORT PROPERTIES 401 S LINCOLN AVE CLEARWATER FL , 34616	58.000	LAKE HARRIS, CLASS I	10/ 7/1991
4-069-0167AM	ADK PROPERTIES 1617 US HWY 19 SOUTH SUITE 300 CLEARWATER FL , 34624	52.000	LAKE HARRIS (CLASS I	7/11/1994
4-069-0167AM2	LAKE PORT PROPERTIES 410 SOUTH LINCOLN AVE. CLEARWATER FL , 34616	58.000	LAKE HARRIS (CLASS I	8/ 6/1995
4-069-0168AGC	CITY OF EUSTIS P.O. DRAWER 68 EUSTIS FL , 32727	17.300		/ /
4-069-0176A	DONALD ROE P.O. BOX 998 LEESBURG FL , 34749	35.400	DOT DITCH TO LAKE DE	4/ 6/1992
4-069-0176AE	ROYAL OAK ESTATES OF LAKE COUN 2901 SOUTH STREET LEESBURG FL , 32778	35.350	LAKE DENHAM	5/12/2007
4-069-0177A	BARNETT BANK OF PALM BEACH COU 625 NORTH FLAGLER DRIVE WEST PALM BEACH FL , 33401	17.300	UNNAMED LANDLOCKED L	4/ 6/1992
4-069-0181AC	GUY T RIZZO ENTERPRISES 2401 LAKE HARRIS DR UN 12 TAVARES FL , 32778	190.000		/ /
4-069-0183A	GUY T RIZZO ENTERPRISES	190.000		/ /
4-069-0187A	SOUTHPORT VILLAGE INC. 4045 S. ORANGE BLOSSOM TR ORLANDO FL , 32809	1.200	LAKE DORA (CLASS III	/ /
4-069-0191A	CARL SOMMERS RT. 1 BOX 150 OXFORD FL , 32684	1.240		/ /
4-069-0196A	MT DORA SHOPPING CENTER LTD 8500 EAST BLVD P. O. BOX 235000 MONTGOMERY AL , 36123	20.640	LAKE WOODWARD. (CLAS	12/ 8/1992
4-069-0196AM	MT DORA SHOPPING CENTER LTD	20.640	LAKE WOODWARD (CLASS	3/ 8/1993

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4-069-0197A	KEITH SHAMROCK	112.600	LAKE JOANNA (CLASS I	8/ 9/1993
4-069-0197AE	KEITH SHAMROCK 2100 LAKE EUSTIS DRIVE TAVARES FL , 32778	112.600	LAKE JOANNA (CLASS I	3/ 9/1995
4-069-0211A	GEORGE PRINGLE	52.000	HAINES CREEK	10/11/1994
4-069-0215A	TRIANGLE CONSTRUCTION CO. ATTN: GENE SMITH 359 W ALFRED ST. TAVARES FL , 32778	1.000	LAKE DORA (CLASS III	8/ 9/1993
4-069-0218AG	CITY OF EUSTIS P.O. DRAWER 68 EUSTIS FL , 32727	3.900	TROUT LAKE (CLASS II	10/11/1993
4-069-0220A	HAROLD HOLLAND DEVELOPMENT, IN ATTN: HAROLD HOLLAND 1 FOX RUN BLVD TAVARES FL , 32778	116.400	WETLANDS WHICH OUTFA	12/13/1993
4-069-0220AE	HAROLD HOLLAND DEVELOPMENT 440 FOX RUN BOULEVARD TAVARES FL , 32778	116.400	DORA CANAL TO LAKE E	12/ 8/1994
4-069-0226A	SUNDOR BRANDS, INC. EAST ROBIE STREET MT. DORA FL , 32757	3.150	NONE	/ /
4-069-0231AG	LAKE COUNTY BOARD OF COUNTY CO 315 W MAIN ST TAVARES FL , 32778	19.900	SWAMP WHICH OUTFALLS	12/12/1991
4-069-0231AGM	LAKE COUNTY BOARD OF COUNTY CO 315 W. MAIN STREET TAVARES FL , 32778	8.200	LAKE DORA	2/12/1996
4-069-0232A	MONARCH HOMES 130 UNIVERSITY PARK DRIVE WINTER PARK FL , 32792	439.000	WOLF BRANCH CREEK (C	3/12/1995
4-069-0232AM	MONARCH HOMES P.O. DRAWER 1630 WINTER PARK FL , 32790	438.500	WOLF BRANCH CREEK (C	6/11/1996
4-069-0232AM2	GEORGE WIMPEY OF FLOLRIDA, INC 201 NORTH NEW YORK AVE. WINTER PARK FL , 32790	438.500	WOLF BRANCH CREEK (C	8/13/1996
4-069-0232AM3	GEORGE WIMPEY OF FLORIDA 201 NORTH NEW YORK AVE. WINTER PARK FL , 32789	438.500	WOLF BRANCH CREEK (C	1/14/1997
4-069-0232AM4	GEORGE WIMPEY OF FL. INC. 201 N. NEWYORK AVENUE SUITE 201 WINTER PARK FL , 32789	40.000	WOLF BRANCH CREEK (C	2/ 9/1998
4-069-0232AM5	GEORGE WIMPY OF FLORIDA INC. 201 N. NEW YORK AVENUE, SUITE 201 WINTER PARK FL , 32789	186.300	WOLF BRANCH CREEK CL	7/13/1998
4-069-0236AC	DEER ISLAND PARTNERS, LTD. P.O. BOX 26443 GREENVILLE SC , 29616	283.000	LAKE DORA & LAKE BEA	4/10/1910
4-069-0245A	RICHARD BOSSERMAN	92.010		4/ 9/1996
4-069-0248AG	CITY OF LEESBURG 600 W. ORANGE P.O. BOX 630 LEESBURG FL , 32749-0630	4.000	LAKE GRIFFIN (CLASS	6/11/1996
4-069-0250A	LAKE CARE SYSTEMS, INC. 812 N. BAY STREE EUSTIS FL , 32726	12.300	LAKE GERTRUDE	2/12/1996
4-069-0253A	DEER ISLAND PARTNERS, L.P. 2100 S.E. OCEAN BLVD SUITE 303 STUART FL , 34996	378.300	LAKE DORA & LAKE BEA	2/11/1997

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APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
4-069-0261AG	FLORIDA DEPARTMENT OF TRANSPOR 719 SOUTH WOODLAND BLVD. DELAND FL , 32720	27.600	LAKE GRIFFIN (CLASS	4/ 7/1997
4-069-0265AG	FLORIDA DEPARTMENT OF TRANSPOR 719 S. WOODLAND BLVD DELAND FL , 32720	100.000	WEKIVA RIVER, ROCK S	3/10/1997
4-069-0265AGM2	FLORIDA DEPARTMENT OF TRANSPOR 719 S. WOODLAND BLVD. DELAND FL , 32720	4.500	OFF-SITE DEPRESS., U	2/ 8/1999
4-069-0268A	WAL-MART STORES, INC. 702 S.W. 8TH STREET BENTONVILLE AK , 727160095	18.700	INDIRECT OUTFALL TO	/ /
4-069-0269A	LAKE LOUIS LAND TRUST CAVAUGHN P.O. BOX 620 EUSTIS FL , 32727	33.440	LANDLOCKED BASIN (CL	5/12/1997
4-069-0269AM	WAL-MART STORES, INC. 701 SOUTH WALTON BOULEVARD BENTONVILLE AR , 72716	33.440	LANDLOCKED BASIN (CL	11/10/1997
4-069-0278AG	FLORIDA DEPARTMENT OF TRANSPOR 719 S. WOODLAND BOULEVARD DELAND FL , 32720	251.000	BLACKWATER CREEK (OF	2/ 9/1998
4-069-0283AG	FLORIDA DEPARTMENT OF TRANSPOR 719 S. WOODLAND BLVD. DELAND FL , 32720	18.220	DRAINAGE DITCH, CLAS	/ /
4-069-0294A	JA-MAR FARMS, INC. 1603 LOVES POINT DRIVE LEESBURG FL , 32748	26.400	LAKE DENHAM MARSH (C	4/12/1999
40-069-0005A	DE-ANZA MID-FLORIDA LAKES 9171 WILSHIRE BLVD SUITE 610 BEVERLY HILLS CA , 90210	50.000		8/ 1/1985
40-069-0005AE	DE ANZA MID-FLORIDA LAKES 9171 WILSHIRE BLVD. SUITE 610 BEVERLY HILLS CA , 90210	55.000	HAINES CREEK	8/ 5/1986
40-069-0005AEF	DE-ANZA MID-FLORIDA LAKES	55.000	HAINES CREEK (CLASS	9/ 5/1991
40-069-0022AG	CITY OF MOUNT DORA P.O. BOX 176 MT. DORA FL , 34737	40.000		/ /
40-069-0035A	ROBERT STETLER	8.800	CHITTY-CHATTY RUN	5/20/1991
40-069-0037A	CARL LUDECKE	59.000	NONE	6/17/1991
40-069-0038A	CENTURY GROUP INC P.O. BOX 5252 LAKELAND FL , 33803	59.000	LAKE GRIFFIN (CLASS	12/31/1991
40-069-0038AM	CENTURY GROUP, INC. P. O. BOX 7079 WINTER HAVEN FL , 338837079	60.300	LAKE GRIFFIN	12/18/1997
40-069-0045A	LAKE COUNTY ASSOCIATES, LTD.	17.300	UNNAMED LAND-LOCKED	3/17/1992
40-069-0048A	DIVERSICARE CORP 715 EAST DIXIE AVENUE LEESBURG FL , 34748	0.000		/ /
40-069-0051A	MT DORA SHOPPING CTR LTD	13.500	LAKE WOODWARD	10/ 1/1992
40-069-0067A	GEORGE PRINGLE 1 SCOTTISH HIGHLANDS BLVD LEESBURG FL , 34788	6.370	HAINES CREEK (CLASS	9/27/1993
40-069-0069A	LAKE CARE SYSTEMS, INC. ATTN: ZEB OSBORNE 812 N. BAY STREET EUSTIS FL , 32726	41.700	LAKE GERTRUDE (CLASS	12/28/1993
40-069-0070A	LAKE FRANCIS ESTATES INC. ATTN: JIM KEY P. BOX 1183 TAVARES FL , 32778	17.000	LAKE FRANCIS	6/30/1994

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40-069-0077A	PEREGRINE PROPERTIES, INC. P.O. BOX 1118 WINTER PRAK FL , 32790	11.430	UNNAMED, LAND LOCKED	7/28/1994
40-069-0077AM	PEREGRINE PROPERTIES, INC. P.O. BOX 1118 WINTER PARK FL , 32790	11.430	UNNAMED POND, LAND L	3/20/1995
40-069-0084A	SHELBY DEVELOPMENT 201 N NEW YORK AVE WINTER PARK FL , 32789	113.000	WOLFBRANCH/LAKELOCHL	2/ 1/1995
40-069-0089A	HARRELL & SUTHERLAND DEVELOPME ATTN: ROBERT S. HARRELL, PRESIDENT 4202 SOUTH ORANGE AVENUE ORLANDO FL , 32806	39.000	NONE	7/20/1995
40-069-0095A	DELMAR LIGHT RT 3 BOX 163 BUCKHANNON WV , 26201	66.610	LAKE GRIFFIN	1/18/1996
40-069-0101A	MARTY NORMAN PO BOX 2 LADY LAKE FL , 32159	112.000		8/27/1996
40-069-0106A	BAUCOM'S OF FLORIDA 300 BRITT ROAD MT. DORA FL , 32757	100.800		1/ 8/1997
40-069-0106AM	BAUCOMS OF FLORIDA 3050 BRITT RD. MT. DORA FL , 32757	100.800	LAKE AMOS (LAND-LOCK	11/ 3/1998
40-069-0106AM2	BAUCOM'S OF FLORIDA 3050 BRITT ROAD MT. DORA FL , 32757	0.000	UNNAMED SMALL LAKE I	/ /
40-069-0110AG	CITY OF MOUNT DORA 510 N BAKER ST. P. O. BOX 176 MOUNT DORA FL , 32757	4.090	LAKE DORA (CLASS III	6/ 1/1997
40-069-0115AW	GLEN M. JONES, TRUSTEE P. O. BOX 1532 TAVARES FL , 32778	5.400	BURLEIGH POND, CLASS	4/16/1998
40-069-0126AW	JOHN D. & SHERRY S. MCLEOD P. O. BOX 885007 LEESBURG FL , 327885007	16.000	LAKE DORA, CLASS III	7/23/1998
40-069-0127A	FLORIDA LEISURE LMTD. 146 HORIZON COURT LAKELAND FL , 33813	9.670	ROBINSON LAKE, CLASS	6/23/1994
40-069-0130A	THE FIRST BAPTIST CHURCH OF EU 719 E. ORANGE AVE. EUSTIS FL , 32726	23.000	BLUE LAKE	/ /
40-069-0133AG	CITY OF MT. DORA P. O. BOX 176 MT. DORA FL , 32757	0.600	LAKE WOODWARD, CLASS	11/ 1/1995
40-069-0136AW	C.C. & B PARTNERSHIP 131 W. MAIN ST. TAVARES FL , 32778	12.420	LAKE GRIFFIN, CLASS	11/24/1998
40-069-0140A	FLORIDA LEISURE LIMITED 146 HORIZON COURT LAKELAND FL , 33813	9.300	LAKE DEAATON, CLASS	5/13/1999
40-069-0144AW	EARL STOCKWELL 2722 WESTSIDE DRIVE LEESBURG FL , 34748	2.710	UNNAMED WET PRAIRIE	/ /
40-069-0146AW	SOUTHERN FISH CULTURISTS, INC. P. O. BOX 490251 LEESBURG FL , 347490251	0.750	LAKE HARRIS, CLASS I	3/11/1999
6-069-0003A	MEDARD, EDWARD 709 SOUTH BAYLSTON ST. LEESBURG FL , 34748	1.000		8/17/1978

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6-069-0005A	FAVORITE, KENNETH 106 ISLAND DRIVE LEESBURG FL , 34748	1.000		12/14/1978
6-069-0011A	ROSS, KENNETH RT. 2 BOX 156 TAVARES FL , 32778	1.000		5/ 1/1978
6-069-0012A	FLORIDA DEPARTMENT OF TRANSPOR P.O. BOX 1089 LAKE CITY FL , 32056	5.000		9/ 1/1980
6-069-0017A	STIFEL III, ARTHUR C. 87 LAKESHORE DRIVE TAVARES FL , 32778	0.100		1/11/1979
6-069-0018A	STOWELL, VENITA ROUTE 5 BOX 131 LEESBURG FL , 34748	0.000		7/12/1979
6-069-0020A	LOWIS, EDWARD RT. 3 BOX 1593 LEESBURG FL , 34748	0.000		1/11/1979
6-069-0024A	LEESBURG, CITY OF	107.000		9/ 5/1988
6-069-0024AGM	CITY OF LEESBURG 501 W MEADOW LEESBURG FL , 32749	1.000	LAKE HARRIS (CLASS I	10/ 9/1995
6-069-0024AGM2	CITY OF LEESBURG P.O. BOX 490630 LEESBURG FL , 33479	2.300	LAKE HARRIS (CLASS I	11/12/1996
6-069-0024AGM3	CITY OF LEESBURG POST OFFICE BOX 490630 LEESBURG FL , 33479	0.034	LAKE HARRIS CLASS II	8/11/1997
6-069-0025A	ANDERSON, L. A. RT. 1 BOX 75 TAVARES FL , 32778	1.000		10/12/1988
6-069-0027A	ATWOOD, JOE P.O. BOX 1059 EUSTIS FL , 32726	0.020		10/12/1988
6-069-0028A	SABO, ANDREW 29 MORNING VIEW DRIVE TAVARES FL , 32778	0.000		10/17/1988
6-069-0029A	HARBOR OAKS 3100 PICCIOLA ROAD LEESBURG FL , 34748	0.000		11/14/1981
6-069-0030A	FISCHER, HORST 815 BASS STREET LEESBURG FL , 34748	1.000		5/17/1979
6-069-0031A	POLK, NANCY 1207 DELEON AVENUE LEESBURG FL , 34748	0.250		5/15/1979
6-069-0032A	BERNING, JOHN R. P.O. BOX 975 FRUITLAND PARK FL , 34731	12.000		1/15/1980
6-069-0033A	LEE, KENNETH LOT #93 HARBOR SHORES LEESBURG FL , 34748	0.000		1/15/1980
6-069-0034A	BUCHS, MARIBEL 1116 DORA AVE. TAVARES FL , 32778	0.250		1/15/1980
6-069-0034AE	MARIBEL BUCHS 1116 DORA AVE. TAVARES FL , 32778	0.250		11/11/1984

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6-069-0035A	HALL, ELZIE P.O. BOX 361 GRAND ISLAND FL , 32735	1.000		8/20/1979
6-069-0040A	YATES, ROBERT P.O. BOX 537 GRAND ISLAND FL , 32735	1.000		8/ 9/1980
6-069-0043A	MCLEOD JR., JOHN D.	0.150		11/14/1982
6-069-0045A	FLA. TELEPHONE CORP. P.O. BOX 48 LEESBURG FL , 34748	0.500		1/16/1981
6-069-0046A	FLA. TELEPHONE CORP.	0.500		1/16/1981
6-069-0048A	FONTANA, JOSEPH H.	0.000		06/11/81
6-069-0049A	STANFIELD, JAMES W. RURAL ROUTE BOX 1632 LEESBURG FL , 34748	0.000		7/ 9/1981
6-069-0052AE	SHANGRI-LA-BY-THE-LAKE P.O. BOX 1921 EUSTIS FL , 32726	1.000		7/10/1984
6-069-0053A	PAUL JR., & PEGGY SELLERS ROUTE 3 BOX 682 TAVARES FL , 32778	1.500		6/ 9/1982
6-069-0054AEM	DAVID ANDREWS P.O. BOX 809 TAVARES FL , 32778	0.100	LAKE EUSTIS	10/ 7/1991
6-069-0057A	YALE, D. H. P.O. BOX 1712 LEESBURG FL , 34748	0.020		3/ 9/1983
6-069-0059A	MANN, RICHARD	0.000		00/00/00
6-069-0060A	WALKER, LYNN P.O. BOX 385 TAVARES FL , 32778	0.300		9/10/1982
6-069-0063A	GRIZZARD, TOM 1341 WEST GRIFFIN ROAD LEESBURG FL , 34748	1.700		11/10/1983
6-069-0064A	SHANGRI-LA BY THE LAKE P.O. BOX 283 LEESBURG FL , 34748	18.640		8/ 9/1985
6-069-0064AM	WILLIAM GOLDEN 100 SHANGRI-LA BLVD LEESBURG FL , 34788	13.500	LAKE EUSTIS (WOD) (C	8/ 6/1995
6-069-0064AM2	WILLIAM GOLDEN 100 SHANGRI-LA BLVD LEESBURG FL , 34788	43.600	LAKE EUSTIS CLASS II	5/12/1997
6-069-0064AM3	SHANGRI-LA BY THE LAKE, INC. 100 SHANGRI-LA BLVD. LEESBURG FL , 32788	9.300	LAKE EUSTIS (WOD) (C	6/ 8/1998
6-069-0068A	BD. CO. COMM. LAKE CO. 315 N. MAIN ST. TAVARES FL , 32778	1.000		2/ 9/1985
6-069-0069A	HOCHSTETTLER, WILLIAM 320 LAKE DORA ROAD MT. DORA FL , 32757	1.000		4/12/1985
6-069-0070A	GRIZZARD, TOM	30.000		3/ 8/1985
6-069-0070AF	TOM GRIZZARD 1341 W. GRIFFIN LEESBURG FL , 34748	6.300	LAKE GRIFFIN	/ /
6-069-0070AFM	TOM GRIZZARD	6.000	LAKE GRIFFIN (CLASS	/ /

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6-069-0075A	RONALD & CHARLOTTE M. CUNNING 526 TAMMI DRIVE LEESBURG FL , 34748	38.000		2/ 8/1986
6-069-0077A	WATERMAN MEMORIAL HOSPITAL P.O. DRAWER B EUSTIS FL , 32726	25.000		8/10/1985
6-069-0077AM	WATERMAN MEMORIAL HOSPITAL 116 E. MACDONALD P.O. BOX B EUSTIS FL , 32727	1.620	LAKE EUSTIS (CLASS I	10/ 9/1995
6-069-0078A	HERLONG, PHILIP K. P.O. BOX 52 LEESBURG FL ,	12.000		10/11/1985
6-069-0081A	DERAND EQUITY GROUP, INC.	0.000		8/13/1990
6-069-0081AEFM	ALAN CHEEK 421 N. BAKER ST. - UNIT C MOUNT DORA FL , 32757	0.000	LAKE DORA (CLASS III	4/13/1998
6-069-0081AEM	DERAND EQUITY GROUP INC. 2201 WILSON BLVD ARLINGTON VA , 32745	0.980	LAKE DORA	8/11/1989
6-069-0085AG	EUSTIS, CITY OF P.O. DRAWER 68 EUSTIS FL , 32727	9.530		1/11/1986
6-069-0087A	CHARLES W. GREGG 220 SOUTH 9TH STREET LEESBURG FL , 34748	10.000		8/ 8/1986
6-069-0089A	CITY OF MT. DORA	0.000		/ /
6-069-0094AG	LAKE COUNTY BOARD OF CO. COMM. 315 WEST MAIN STREET TAVARES FL , 32778	20.000	Work of the District	12/11/1985
6-069-0096A	JAMES A. GRAY 1089 PALM HARBOR DRIVE LEESBURG FL , 34748	4.000	COVE THAT CONNECTS T	2/12/1990
6-069-0110A	MALCOLM MCCALL 1633 UMATILLA ROAD EUSTIS FL , 32726	1.000	TROUT LAKE	/ /
6-069-0112A	HAROLD F. HOLLAND C/O FOX RUN INC. 1 FOX RUN BLVD TAVARES FL , 32778	0.700	LAKE HARRIS (CLASS I	12/ 9/1991
6-069-0120A	DAVID WEIS P.O. BOX 1227 TAVARES FL , 32778	11.100	LAKE EUSTIS (CLASS I	10/11/1993
6-069-0120AM	DAVIS WEIS P.O. BOX 1227 TAVARES FL , 32778	12.730	LAKE EUSTIS	/ /
6-069-0121AG	CITY OF EUSTIS P.O. DRAWER 68 EUSTIS FL , 32727	0.250	LAKE EUSTIS (CLASS I	7/ 9/1995
6-2729	WALL, ROBERT	0.000		00/00/00
6-2917	PASILL, RICHARD	0.000		00/00/00
6-3435	PASAK, JOSEPH E.	0.000		00/00/00
6-3768	VINCENT, JEAN J.	0.000		00/00/00
6-3838	HALL, DONALD	0.000		00/00/00
6-3983	SHANGRI-LA BY THE LAKE	0.000		00/00/00
6-4181	HOLUB, ALOIS	0.000		00/00/00
6-4600	GREGG, CHARLES	0.000		00/00/00
6-4922	ADAMS, FRANK	0.000		00/00/00
6-5304	LAKE SAUNDERS INC.	0.000		00/00/00
6-5576	JONES JR., ALLAN C.	0.000		/ /

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6-7026	GRIZZARD, THOMAS	0.000		00/00/00
6051878014	KUHN, GEORGE	0.000		00/00/00
6051878015	WILLIAMS, GORDON	0.000		00/00/00
6062778175	GRANT, HOWARD	0.000		00/00/00
6071978245	CROFTON, CARL	0.000		00/00/00
6091378411	GRAMLING, OLIVER	0.000		00/00/00
6110978628	SENERCHIA, ROBERT R.	0.000		00/00/00
4-069-0027A	GOLUB, MURRAY P.O. BOX 17755 ORLANDO FL , 32865	0.000		00/00/00
4-069-0031A	BAIR, RICHARD E. 1114 N. OAK DRIVE LEESBURG FL , 34748	4.000		5/10/1986
4-069-0035A	BAIRD MOBILE HOMES, INC. RT. 3 BOX 1133 LAKE UNIT 4 ROAD LEESBURG FL , 34748	68.300		9/ 6/1985
4-069-0035AM	BAIRD MOBIL HOMES INC.	29.200	WETLANDS WITH LAKE G	1/10/1994
4-069-0035AM2	BAIRD MOBILE HOMES	4.100	LAKE GRIFFIN (CLASS	12/13/1993
4-069-0035AM3	BAIRD MOBILE HOMES OF LEESBURG 1745 E HWY 441 LEESBURG FL , 34748	40.000	LAKE IDLEWILD (CLASS	6/11/1995
4-069-0045A	LOWRIE BROWN 705 DELANEY AVENUE ORLANDO FL , 32801	500.000	HAINES CREEK	6/11/1988
4-069-0064AM	LASEUR, HARVEY S. RT. 13 BOX 240 LEESBURG FL , 34748	5.000		12/14/1985
4-069-0064AME	DEL THOMAS RT 13 BOX 240 LEESBURG FL , 34748	1.100		/ /
4-069-0066A	ASPEN-EUSTIS LIMITED PARTNERSH ATTN: RONALD PIASECKI 2757 44TH SW, SUITE 306 GRAND RAPIDS MI , 49509	22.000		10/12/1985
4-069-0071A	ROY EVERETT SMITH RT. 2 BOX 1032 UMATILLA FL , 32784	60.000		1/11/1986
4-069-0076A	ORANGE BLOSSOM HILLS INC. RT. 8 BOX 452 LADY LAKE FL , 32159	163.000		1/11/1986
4-069-0084A	WATER OAK UTILITY CO. INC. 3 WATER OAK BLVD. LADY LAKE FL , 32159	330.000		/ /
4-069-0084AM	WATER OAK, LTD. ATTN: TEDD A. DAWSON 3 WATER OAK BLVD LADY LAKE FL , 32659	162.500	TWO ON-SITE WATER RE	4/ 7/1991
4-069-0098A	ED BUTTERS RT. 2 BOX 740E (SEE BELOW) UMATILLA FL , 32784	26.000		8/12/1984
4-069-0115A	HOMEWARD CORPORATION P. O. BOX 1357 GOLDENROD FL , 32733	59.000	Lake Yale	12/11/1989
4-069-0129AG	LAKE CO. BOARD OF COMM. 315 WEST MAIN ST. TAVARES FL , 32778	30,000.000	LAKE GRIFFIN	5/ 7/1990
4-069-0138A	MILNER DEVELOPMENT CORP. P.O. BOX 356 GRAND ISLAND FL , 32735	248.000	GROUNDWATER LAKE EUS	6/11/1990

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4-069-0142A	RENAISSANCE GROUP OF TAMPA 2059 N DALE MABRY TAMPA FL , 33607	388.000	EMERALDA MARSH	10/ 8/1986
4-069-0142AF	WALKER RANCH, INC. 3001 EXECUTIVE DR. SUITE 200 CLEARWATER FL , 34622	388.000	EMERALDA RANCH	11/17/1988
4-069-0179A	G.D. MANLEY 801 S. CENTRAL AVE. UMATILLA FL , 32784	0.707		/ /
4-069-0193A	ARNOLD T. JACKSON 40515 EMERALDA RD. LEESBURG FL , 34748	17.000		/ /
4-069-0195AC	THE 347 CORPORATION OF FLORIDA 16114 N FLORIDA AVE LUTZ FL , 33549	855.000	LAKE GRIFFIN (CLASS	4/12/1908
4-069-0204AC	HERBERT C. STENGER 17503 LAKE TERRACE DR. EUSTIS FL , 32726	137.000	LAKE EUSTIS (CLASS I	5/ 9/1908
4-069-0205A	THE 347 CORPORATION OF FLORIDA 16114 N FLORIDA AVE LUTZ FL , 33549	160.000	LAKE GRIFFIN (CLASS	4/12/1993
4-069-0205AM	THE 347 CORPORATION OF FLORIDA 16114 N FLORIDA AVE LUTZ FL , 33549	175.000	LAKE GRIFFIN (CLASS	2/ 7/1994
4-069-0205AM2	THE 347 CORPORATION OF FLORIDA 16114 N FLORIDA AVE LUTZ FL , 33549	37.400	LAKE GRIFFIN (CLASS	7/ 9/1995
4-069-0205AM3	347 CORP. OF FLORIDA INC. 16114 NORTH FL. AVE. LUTZ FL , 33549	1.960	LAKE GRIFFIN	3/11/1996
4-069-0205AM4	DEV-CON ASSOCIATES 350 BAY STREET, STE 1200 TORONTO CN , M5H 2S6	0.000	N/A	/ /
4-069-0208A	RICHARD BAUGH	7.500	ADJACENT WELANDS, EV	6/ 7/1993
4-069-0217A	HERBERT C. STENGER	38.000	LAKE EUSTIS (CLASS I	9/13/1993
4-069-0217AM	HERBERT C STENGER 17503 LAKE TERRACE DR. EUSTIS FL , 32726	38.000	LAKE EUSTIS (CLASS I	3/ 6/1994
4-069-0217AM2	HERBERT C. STENGER 17503 LAKE TERRACE DR. EUSTIS FL , 32726	12.000	LAKE EUSTIS (CLASS I	5/ 9/1994
4-069-0217AM3	HERBERT C. STENGER 17503 LAKE TERRACR DR. EUSTIS FL , 32726	12.000	LAKE EUSTIS (CLASS I	11/13/1994
4-069-0217AM4	HERBERT C. STENGER 17503 LAKE TERRACE DR EUSTIS FL , 32726	22.800	LAKE EUSTIS (CLASS I	2/13/1995
4-069-0217AM5	HERBERT STENGER 17503 LAKE TERRACE DRIVE EUSTIS FL , 34726	69.600	LAKE EUSTIS (CLASS I	11/13/1995
4-069-0217AM6	HERBERT STENGER 102 VILLAGE LANE MT. DORA FL , 32757	42.200	LAKE EUSTIS	2/12/1996
4-069-0217AM7	HERBERT STENGER 17503 LAKE TERRACE DRIVE EUSTIS FL , 34726	16.720	LAKE EUSTIS (CLASS I	9/ 8/1997
4-069-0218AG	CITY OF EUSTIS P.O. DRAWER 68 EUSTIS FL , 32727	3.900	TROUT LAKE (CLASS II	10.11/1993

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4-069-0227A	DAPHNE MCLACHLAN P.O BOX 525 MT. DORA FL , 32757	211.000	LAKE DALHOUSIE & RUS	/ /
4-069-0280A	JACK AUSTIN & JOHN R. NEWBOLD, P.O. BOX 480 UMATILLA FL , 32784	0.000	EAST BRANCH CANAL T	2/ 9/1998
4-069-0281A	GUNARD BRAUTCHECK 34734 TWIN OAKS LANE EUSTIS FL , 32726	0.000	EAST BRANCH CANAL TO	2/ 9/1998
4-083-0150AM	SPRUCE CREEK DEVELOPMENT CO. O 17585 SE 102ND AVE SUMMERFIELD FL , 32691	585.240	GROUND WATER (CLASS	7/ 9/1995
4-5140	GETFORD, ALLEN J.	0.000		00/00/00
40-069-0046AG	LAKE COUNTY BOARD OF CNTY COMM	0.750	EUSTIS MEADOWS MARSH	10/ 8/1992
40-069-0053A	ELEANOR DOUGHERTY P. O. BOX 127 GRAND ISLAND FL , 32735	42.720	LAKE EUSTIS (CLASS I	10/19/1992
40-069-0054A	DON MONN 2101 SOUTH BAY STREET EUSTIS FL , 32726	45.000	STATE ROAD 452 RIGHT	1/ 4/1993
40-069-0062A	RICHARD BAUGH	18.000		/ /
40-069-0080A	IDEAL DEVELOPMENT INC. P.O. BOX 916126 LONGWOOD FL , 32791	47.000	LAKE YALE (CLASS III	1/ 2/1995
40-069-0083A	MORRITT HOMES, INC. 607-A PINELLAS ST CLEARWATER FL , 34616	68.900	LAKE EUSTIS (CLASS I	3/20/1995
40-069-0085A	GJC, INC. ATTN: JAMES H. COTTOM 2113-B N CITRUS BLVD LEESBURG FL , 34748	42.380	UNNAMED POND	5/ 2/1995
40-069-0098A	GRAND ISLAND DEVELOPMENT COMPA 1700 BUENA VISTA DRIVE EUSTIS FL , 32726	100.000	LAKE EUSTIS (CLASS I	4/30/1996
40-069-0137AW	OPUS SOUTH CORPORATION 4200 W. CYPRESS ST. TAMPA FL , 33607	8.436	HICKS DITCH/TROUT LA	12/20/1998
6-069-0014A	KUTCH JR., FRANK J.	0.150		5/17/1979
6-069-0044AF	LAST RESORT FISH CAMP, INC	0.000		7/12/1985
6-069-0051A	RATEAU, ANGUS	0.500		10/14/1981
6-069-0056A	FLOYD, J. D. RT. 2 BOX 222 LEESBURG FL , 34748	0.260		4/13/1983
6-069-0056AM	FLOYD, J. D.	0.260		8/13/1985
6-069-0079A	LAMB, MAURICE	0.000		00/00/00
6-069-0082A	JOHN P. WESTERVELT PO BOX 630 UMATILLA FL , 32784	5.000		4/10/1986
6-069-0082AE	JOHN P. WESTERVELT	5.000	LAKE YALE	4/ 7/1991
6-069-0090A	BAIRD MOBILE HOMES INC. 1745 E. HWY 441 LEESBURG FL , 34748	0.000		8/ 7/1986
6-069-0092A	CATHERINE GILES	37.000	LAKE GRIFFIN	4/ 8/1986
6-069-0095A	JAMES & SHARON GARRIS P. O. BOX 94 GRAND ISLAND FL , 32735	0.000	LAKE YALE	/ /
6-069-0098AG	BASSVILLE PARK FIRE DISTRICT ROUTE 4 BOX 574A BASSVILLE PARK FL ,	0.000		/ /

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6-069-0108A	WILLARD HARRIS 302 SACKAMAXON ROAD SORRENTO FL , 32776	0.500	LAKE YALE	/ /
6-069-0113A	DON MONN REALTY 2101 SOUTH BAY STREET EUSTIS FL , 32726	2.900	LAKE YALE	/ /
6-4402	MURPHY, HOWARD H.	0.000		00/00/00
6-5139	GETFORD, ALLEN J.	0.000		00/00/00
6-5941	IRWIN, GLENN	0.000		00/00/00
4-069-0065A	PETER GERMEROTH & ASSOC.	0.000		00/00/00
4-083-0003AM	FLORIDA ROCK INDUSTRIES INC	131.000	NONE, LANDLOCKED DEP	1/13/1992
4-083-0012A	IAROSSI, NICK 6240 SE 119 PLACE BELLEVIEW FL , 32620	0.000		12/14/1985
4-083-0016A	SMALLRIDGE, W. H. RT. 2 BOX 273 OKLAWAHA FL , 32179	17.000		10/11/1985
4-083-0022A	MARLLO, INC.	0.000		00/00/00
4-083-0032A	MADISON DEVELOPMENT CORP.	162.000		/ /
4-083-0040A	TALLEY BEEFMASTERS, INC. P.O. BOX 817 LEESBURG FL , 34748	10.200		/ /
4-083-0042AE2M	SILVER SPRINGS SHORES SUBD.	473.000		/ /
4-083-0042AE2M5	SILVER SPRINGS SHORES SUBD.	504.000		/ /
4-083-0059A	DREXEL INVESTMENTS, INC. 2477 EAST COMMERCIAL BLVD FORT LAUDERDALE FL , 33308	123.000	LAKE WEIR	12/10/1990
4-083-0061A	WILLIAM TALLEY SR. P. O. BOX 817 LEESBURG FL , 34748	0.000		/ /
4-083-0065A	LLOYD E. SMITH (MARLLO INC.) 3015 FRANKLIN ROAD BLOOMFIELD HILL MI , 48013	887.100	OKLAWAHA RIVER	5/ 7/1990
4-083-0065AM	WILL RADCLIF 1950 RADCLIFF DRIVE CINCINNATI OH , 45204	887.100	OCKLAWAHA RIVER	10/ 8/1990
4-083-0068A	PAUL GIBSON 3101 SW COLLEGE ROAD SUITE 203 OCALA FL , 32674	39.000	Florida Aquifer	12/11/1989
4-083-0083A	WALTER HOFFMAN 127 LAUREL OAK DRIVE LONGWOOD FL , 32779	0.000		/ /
4-083-0128AG	MARION CO BRD OF COMMISSIONERS	0.000		/ /
4-083-0146A	LAKE WEIR SHORES UNIT 3 INC. P.O. BOX 1686 BELLEVIEW FL , 32620	68.000	GROUNDWATER (CLASS I	2/13/1995
4-083-0150A	SPRUCE CREEK DEVELOPMENT CO. O 7753 SW SR 200 OCALA FL , 32676	64.970	GROUND WATER (CLASS	4/10/1995
4-083-0150AM	SPRUCE CREEK DEVELOPMENT CO. O 17585 SE 102ND AVE SUMMERFIELD FL , 32691	585.240	GROUND WATER (CLASS	7/ 9/1995
4-083-0150AM2	SPRUCE CREEK DEVELOPMENT CORP. 17585 SE 102ND AVE SUMMERFIELD FL , 34491	84.000	COMPLETE RETENTION/G	4/12/1999
4-083-0154A	GEORGE ALBRIGHT P.O. BOX 275 OKLAWAHA FL , 32719	43.990	LAKE WEIR	1/14/1997

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4-083-0158AG	MARION COUNTY 2631 D S.E. 3RD STREET OCALA FL , 32671-2690	47.300	LAKE WEIR AND LITTLE	9/ 8/1997
4-083-0172A	EUGENE A. WIECHENS, TRUSTEE 2603 SE 17TH STREET OCALA FL , 34471	116.210	GROUNDWATER	/ /
4-4240	FLA. ROCK INDUSTRIES	60.000		3/18/1981
4-5449	SUNNYHILL SOUTH, INC. RT 1 BOX 592-A UMATILLA FL , 32684	4,000.000		/ /
4-5695	HATFIELD, MICHAEL H. P.O. BOX 268 UMATILLA FL , 32784	1.000		/ /
40-069-0122AG	FLORIDA DEPARTMENT OF TRANSPOR 719 S. WOODLAND BLVD. DELAND FL , 32721-0047	10.460	LAKE DORR, CLASS III	3/30/1998
40-069-0139A	LAKE COUNTY BOYS RANCH P. O. BOX 129 ALTOONA FL , 32702	2.600	UNNAMED DEPRESSIONAL	1/24/1999
40-069-0151A	MILLER ENTERPRISES, INC. 331 CENTRAL AVE. CRESCENT CITY FL , 32112	1.990	LAKE KING, CLASS III	5/13/1999
40-083-0001A	SUMNER KENNETH	0.000		/ /
40-083-0003A	GEORGE ALBRIGHT P. O. BOX 725 OKLAWAHA FL , 32179	104.000		5/14/1989
40-083-0003AM	GEORGE ALBRIGHT	104.000		12/13/1989
40-083-0039A	MARKET OF MARION INC. 1275 BEVILLE RD. DAYTONA BCH FL , 32119	72.690	NONE	10/ 2/1992
40-083-0062A	W. RAY III, TRUSTEE P.O. BOX 1082 OCALA FL , 32671	34.590		10/ 2/1994
40-083-0064AG	MARION COUNTY SCHOOL BOARD P.O. BOX 670 OCALA FL , 326780670	19.000		/ /
40-083-0083AW	DOUG JOHNSON AND SANDY GIASSON 11356 SE 53RD CT. BELLEVIEW FL , 34420	0.540	N/A	11/ 5/1997
40-083-0094A	SPRUCE CREEK DEVELOPMENT CORP. 17585 S.E. 102ND AVENUE SUMMERFIELD FL , 34491	84.000	COMPLETE RETENTION/G	6/ 4/1994
6-083-0006AG	FLORIDA DEPARTMENT OF TRANSPOR P.O. BOX 1089 LAKE CITY FL , 32056	12.300		11/ 9/1988
6-083-0007A	ROSE & ASSOCIATES INC. CARL A ROSE/JUSTIN FINSER CARL A ROSE RT 1 BOX 447 UMATILLA FL , 32784	0.000		/ /
6-083-0009AG	FLORIDA GAME & FISH COMMISSION 620 S. MERIDIAN STREET TALLAHASSEE FL , 32301	0.900		/ /
6-083-0011A	WOODROW FULFORD P. O. BOX 1794 OCALA FL , 32678	0.300	OKLAWAHA RIVER	5/ 7/1990
6-5448	SUNNYHILL SOUTH, INC.	4,000.000		/ /
6071278GV1	MARION CO. BD. OF CO. COMM	0.050		10/12/1988
4-069-0006A	MCDONALD-MATTEO ENTERPRISE 38 EAST OSCEOLA ST. STUART FL , 33494	0.000		11/ 9/1984

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4-069-0006AE	MCDONALD-MATTEO ENT. INC. 7190 S. FEDERAL HWY STUART F , 33494	48.000	PALATLAKAHA RIVER;HE	3/12/1986
4-069-0006AEM	LAKE HARRIS LANDINGS 3471 S.W. 7TH STREET P.O. BOX 3862 OCALA FL , 32678	15.400	LAKE HARRIS PALATAKA	1/15/1996
4-069-0016A	WATERWOOD, INC. P.O. BOX 337 YALAHA FL , 34797	9.200		11/ 9/1984
4-069-0016AE	WATERWOOD INC. P. O. BOX 337 YALAHA FL , 34797	9.200	LAKE HARRIS	/ /
4-069-0016AEM	WATERWOOD INC P.O. BOX 337 YALAHA FL , 34797	9.200	LAKE HARRIS	8/13/1986
4-069-0016AEM2	WATERWOOD; INC. PO BOX 337 YALAHA FL , 34797	3.900	LAKE HARRIS	1/14/1991
4-069-0016AEM3	WATERWOOD INC. 303 WATERWOOD DRIVE YALAHA FL , 34797	8.000	LAKE HARRIS CLASS II	8/ 6/1995
4-069-0025A	HANNA JR., PAUL M., PRES. #1 OLD MILL ROAD TAVARES FL , 32778	108.000		11/ 9/1985
4-069-0025AE	OLD MILL RUN; INC. #1 OLD MILL ROAD TAVARES FL , 32778	155.000	LAKE DORA	11/ 9/1987
4-069-0026AG	LAKE CO. BD. OF CO. COMM. 315 W. MAIN ST. TAVARES FL , 32778	71.100		6/12/1999
4-069-0038AEM	MURRAY M. GOLUB P. O. BOX 17755 ORLANDO FL , 32860	61.000		/ /
4-069-0038AM	GOLUB, MURRAY M (GEN PART) P.O. BOX 17755 ORLANDO FL , 32860	61.000		10/12/1984
4-069-0059A	LYKES PASCO PACKING CO. P.O. BOX 97 DADE CITY FL , 33525	520.000		11/ 9/1985
4-069-0061A	MATSCHE, JOHN J. P.O. BOX 525 MT. DORA FL , 32757	31.000		11/ 8/1985
4-069-0063A	VAUGHAN, CHUCK	0.000		00/00/00
4-069-0067A	HURLEY, BOBBY DON	0.000		00/00/00
4-069-0075A	VANZANT, DAVID M. 222 ROSSITER STREET MOUNT DORA FL , 32757	18.850		12/14/1985
4-069-0080A	OKLAWAHA BASIN RECREATION	2,900.000	TURKEY LAKE	4/ 8/1990
4-069-0092A	FL ROCK IND., INC. P. O. BOX 4667 JACKSONVILLE FL , 32201	71.000	UNNAMED LAND-LOCKED	4/12/1903
4-069-0099AC	BAUGH INC. 506 S. CENTER ST. EUSTIS FL , 32726	0.000	Lake Harris	/ /
4-069-0103AO	CHAUDOIN MUSSELWHITE FARMS 1129 SEMORAN BLVD. APOPKA FL , 32703	0.000		/ /
4-069-0110A	LAKE DORA RV RESORTS; LTD. ATTN: JOE HILL PO DRAWER 1356 LEESBURG FL , 34748	103.000		9/11/1989

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4-069-0110AE	JOE HILL P.O DRAWER 1356 LEESBURG FL , 32748	103.000	LAKE DORA (CLASS III	10/ 9/1994
4-069-0131A	LAKE COUNTY BOARD OF COMM. 315 WEST MAIN STREET TAVARES FL , 32778	85.000	LAKE HARRIS	3/12/1990
4-069-0133A	JULIA W. DAUGHERTY P.O. BOX 646 TAVARES FL , 32778	0.250	LAKE HARRIS	8/13/1990
4-069-0147A	CATHERINE GILES P. O. BOX 375 LEESBURG FL , 34748	155.000		/ /
4-069-0149A	CARLISLE ROGERS P.O. BOX 1656 LEESBURG FL , 34749	0.000		/ /
4-069-0153A	LAKEWOOD DEV. PARTNERSHIP 25200 U.S. HWY 17 SOUTH LEESBURG FL , 34748	266.000	SAWGRASS LAKE	2/11/1991
4-069-0153AM	LAKEWOOD DEV. PARTNERSHIP	120.000	PALATLAKAHA RIVER	8/12/1991
4-069-0153AM10	PLANTATION AT LEESBURG LTD, PA 25201 HIGHWAY 27 SOUTH LEESBURG FL , 34748-9099	136.700	PALATLAKAHA RIVER (C	3/ 8/1999
4-069-0153AM11	THE PLANTATION AT LEESBURG LIM 25201 HIGHWAY 27 SOUTH LEESBURG FL , 34748	41.000	PALATLAKAHA RIVER (C	2/ 8/1999
4-069-0153AM12	LAKEWOOD DEVELOPMENT PARTNERSH 25201 SOUTH HIGHWAY 27 LEESBURG FL , 32748	136.700	SAWGRASS LAKE AND PA	/ /
4-069-0153AM2	LAKEWOOD DEVELOP. PARTNERSHIP P. O. BOX 2913 LEESBURG FL , 34748	34.850	PALATLAKAHA RIVER (C	6/ 7/1993
4-069-0153AM3	LAKEWOOD DEVELOPMENT 25200 HIGHWAY 27 SOUTH LEESBURG FL , 34748	100.000	PALATLAKAHA RIVER (C	9/13/1993
4-069-0153AM4	LAKEWOOD DEVELOPMENT PARTNERSH 25200 U.S. HIGHWAY 27 SOUTH LEESBURG FL , 32748	5.580	ISOLATED WETLAND & G	11/13/1994
4-069-0153AM5	H. SMITH RICHARDSON FAMILY TRU 25200 SOUTH HIGHWAY 27 LEESBURG FL , 32748	1,551.000	PALATLAKAHA RIVER (C	6/11/1996
4-069-0153AM6	H. RICHARDSON FAMILY TRUST 25200 U.S. HWY 27 LEESBURG FL , 34748	1,550.000	THE PALATLAKAHA RIVE	5/12/1997
4-069-0153AM7	H. SMITH RICHARDSON FAMILY TRU 25201 HIGHWAY 27 SOUTH LEESBURG FL , 34748-9099	1,551.000	PALATLAKAHA RIVER (C	10/ 3/1992
4-069-0153AM8	LAKEWOOD DEVELOPMENT PARTNERSH 25201 HIGHWAY 27 SOUTH LEESBURG FL , 34738-9099	36.440	PALATLAKAHA RIVER (C	12/ 8/1997
4-069-0153AM9	LAKEWOOD DEVELOPMENT PARTNERSH 25201 HWY 27 SOUTH LEESBURG FL , 34748	71.000	PALATLAKAHA RIVER (C	2/ 9/1998
4-069-0190A	HARRY K. KIM 175-80 HILLSIDE AVE. JAMICA NY , 11432	159.300	LAKE HARRIS (CLASS I	2/ 9/1993
4-069-0223A	OMER SCHROCK 12 LAKE WOODWARD DR. EUSTIS FL , 32726	78.300	LAKE MELTON (CLASS I	/ /
4-069-0229A	SCOTTISH HIGHLANDS INC 1 SCOTTISH HIGHLANDS BLVD LEESBURG FL , 32748	539.000	GROUNDWATER (CLASS I	11/13/1994

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4-069-0229AM	PRINGLE DEVELOPMENT INC. 1 SCOTTISH HIGHLANDS BLVD. LEESBURG FL , 34788	539.000		6/11/1996
4-069-0229AM2	PRINGLE DEVELOPMENT 26600 ACE AVENUE LEESBURG FL , 34748	539.000	LAKE HARRIS (CLASS I	5/12/1997
4-069-0229AM3	PRINGLE DEVELOPMENT 26600 ACE AVENUE LEESBURG FL , 34748	539.000	LAKE HARRIS (CLASS I	7/13/1998
4-069-0234AC	LAKEWOOD DEVELOPMENT 25200 HIGHWAY 27 SOUTH LEESBURG FL , 32748	1,551.000	PALATLAKAHA RIVER (C	4/10/1910
4-069-0236AC	DEER ISLAND PARTNERS, LTD. P.O. BOX 26443 GREENVILLE SC , 29616	283.000	LAKE DORA & LAKE BEA	4/10/1910
4-069-0243AG	OKLAWAHA BASIN RECREATION & CO 107 N. LAKE AVE. TAVARES FL , 32778	71.500	LITTLE LAKE HARRIS (	2/12/1996
4-069-0249A	THOMAS P. LINE 102 ORCHID WAY HOWEY-IN-THE-HILLS FL , 34737	7.160	LITTLE LAKE HARRIS (	6/11/1996
4-069-0249AM	THOMAS P. LINE 102 ORCHID WAY HOWEY IN THE HILLS FL , 34737	7.160	N/A	8/11/1997
4-069-0252A	MISSION INN GOLF AND TENNIS RE 10400 C.R. 48 HOWEY-IN-THE-HILLS FL , 34737	575.000		6/11/1996
4-069-0252AM	PACKING HOUSE BY-PRODUCTS CO., 10400 C.R. 48 HOWEY-IN-THE-HILLS FL , 34737	575.000	LITTLE LAKE HARRIS (	5/10/1999
4-069-0253A	DEER ISLAND PARTNERS, L.P. 2100 S.E. OCEAN BLVD SUITE 303 STUART FL , 34996	378.300	LAKE DORA & LAKE BEA	2/11/1997
4-069-0271AG	LAKE COUNTY SCHOOL BOARD 518 WEST ALFRED STREET TAVARES FL , 32778	22.400	LITTLE LAKE HARRIS	4/ 7/1997
4-069-0271AGM	LAKE COUNTY SCHOOL BOARD 518 WEST ALFRED STREET TAVARES FL , 32778	22.400	N/A	8/11/1997
4-095-0002A	LILLARD JOSEPH N. 1605 S. CLAYTON ST. MT. DORA FL ,	93.000		/ /
4-095-0059A	DON GREER P. O. BOX 2249 ORLANDO FL , 32802	103.300		10/ 9/1989
4-095-0147AG	ORANGE CO. PUBLIC WORKS DIV.	1,895.000	LAKE CARLETON	/ /
4-095-0309A	A. DUDA AND SONS, INC. P.O. BOX 257 OVIEDO FL , 32765	2,873.000	LAKE APOPKA	8/ 8/1994
4-095-0309AM	A. DUDA AND SONS, INC. P.O. BOX 257 WEST STATE ROAD 426 OVIEDO FL , 32765	2,873.000	LAKE APOPKA (CLASS I	10/12/1998
4-095-0416A	HOMES IN PARTNERSHIP, INC. 235 E 5TH ST. APOPKA FL , 32703	57.164	LAKE APOPKA (CLASS I	7/ 7/1997
4-3825	LAKE HARRIS ESTATES	0.000		/ /
4-4696	NEWMAN, RICHARD O.	0.000		00/00/00
40-069-0029A	LAKEWOOD DEV. PARTNERSHIP	79.000	SAWGRASS LAKE	1/23/1991
40-069-0072A	LASALLE GROUP AS TRUSTEE 2010 59TH STREET WEST BRANDENTON FL 33506	67.600	LITTLE LAKE HARRIS	6/12/1994

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
40-069-0078A	MISSION INN ATTN: BOB BEUCHER P.O. BOX 441 HOWEY IN THE HILLS FL , 32737	4.350		9/13/1994
40-069-0078AM	ROBERT N BEUCHER P.O. BOX 441 HOWEY IN THE HILLS FL , 32737	1.680	GOLF COURSE LAKES	7/18/1995
40-069-0078AM2	MISSION INN ATTN: BOB FARNSWORTH P.O. BOX 332 HOWEY-IN-THE-HILL FL , 34737	0.150	NONE	7/18/1995
40-069-0078AM3	PACKING HOUSE BY-PROD. CO. DBA TENNIS RESORT 10400 C. R. 48 HOWEY-IN-THE-HILLS FL , 34737	575.000	LAKE HARRIS	4/19/1993
40-069-0116AG	LAKE COUNTY BOARD OF COMMISSIO 315 W. MAIN ST. TAVARES FL , 32778	5.200	LAKE APOPKA, CLASS I	3/ 3/1998
6-069-0001A	GORDON, SYDNEY G. YORK PA , 17405	2.200		8/17/1978
6-069-0007A	BINGHAM, HAROLD D. 901 S. BAY ST. EUSTIS FL , 32726	0.400		1/18/1979
6-069-0010A	FLORIDA DEPARTMENT OF TRANSPOR P.O. BOX 1089 LAKE CITY FL , 32056	1.000		10/31/1981
6-069-0019A	TRE-O-RIPE GROVES, INC.	0.250		7/11/1979
6-069-0021A	MCLEOD JR., JOHN D. P.O. BOX 1095 LEESBURG FL , 34748	3.000		8/15/1988
6-069-0026A	GONATOS, MICHAEL 2013 HOLLYWOOD DRIVE LEESBURG FL , 34748	1.000		10/12/1988
6-069-0071A	SAVAGE, BENNETT RT. 1 BOX 1206A TAVARES FL , 32778	13.800		4/ 9/1985
6-069-0088A	CONNELL C. C. ROUTE 1 BOX 11-J OKAHUMPKA FL , 34762	0.000		/ /
6-069-0093A	JOYCE WEBER & MARTHA DUTCHER 6804 RUSKIN STREET SPRINGFIELD VA , 22150	1.500	LAKE BEAUCLAIR	/ /
6-069-0102A	WILLIAM F. HOUSE 17 DEER ISLAND ROAD TAVARES FL , 32778	0.200	LAKE BEAUCLAIR	7/ 9/1990
6-069-0105A	CHARLES VAUGHAN RT 1 BOX 1205-C TAVARES FL , 32778	37.000	LAKE HARRIS	9/10/1990
6-069-0106AG	OKLAWAHA BASIN RECREATION	3.000	wo years from the da	11/12/1987
6-069-0111A	DALE DOWNING 620 57TH AVE W #3A BRADENTON FL , 33507	1.600	HELENA RUN	10/ 7/1991
6-069-0115A	THOMAS TECHMAN P.O. BOX 101 YALAHA FL , 34797	0.000	LAKE HARRIS (CLASS I	/ /
6-069-0119A	FLORIDA FRUIT MANAGERS, INC. 5000 SOUTH HIGHWAY 27 LEESBURG FL , 34748	0.900	LAKE HARRIS (CLASS I	1/12/1993
6-095-0014AG	ORANGE CO. PARKS DEPARTMENT 118 WEST KALEY AVENUE ORLANDO FL , 32806	0.200	LAKE BEAUCLAIRE	8/13/1990

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
6-2885	LAKE HARRIS ESTATES, INC.	0.000		00/00/00
6-7538	SAVAGE, BENNETT E.	0.000		00/00/00
6052278028	MACY, STANLEY	0.000		00/00/00
4-069-0001A	WOODLAND HERITAGE 101 WYMORE ROAD SUITE 406 ALTAMONTE SPGS FL , 32701	174.000		2/19/1982
4-069-0005AM2	JAMES P. GILLS 118 HIGH STREET NEW PORT RICHEY FL , 33552	288.000		9/10/1989
4-069-0005AM4	JAMES P. GILLS	6.600	Little Lake Harris a	12/11/1989
4-069-0012A	WOODLAND HERITAGE, INC. 1843 S.R. 434 SUITE 205 LONGWOOD FL , 32750	174.000		4/12/1983
4-069-0012AE	WOODLAND HERITAGE, INC.	174.000		/ /
4-069-0012AEM	WOODLAND HERITAGE ENTERPRISES P. O. BOX 1410 LEESBURG FL , 34749	64.400	GROUNDWATER AND CHUC	4/ 8/1990
4-069-0013A	DUDA, A. & SONS, INC. P.O. BOX 257 OVIEDO FL , 32765	470.000		4/ 1/1984
4-069-0014A	LANGLEY, RICHARD H. P.O. BOX 188 CLERMONT FL , 34711	400.000		3/ 9/1983
4-069-0014AM2E2	OLYMPIA SPORTS WORLD, INC. 138 E. CENTRAL AVE. HOWEY-HILLS FL , 34737	920.000	LITTLE LAKE HARRIS	10/12/1987
4-069-0019A	HAYNIE, WILLIAM G.	0.000		00/00/00
4-069-0022A	BLANKENSHIP, H. L. RT. 2 BOX 105 B CLERMONT FL , 34711	43.000		/ /
4-069-0022AF	VENTURE OUT RESORTS INC. 1818 WEST LAKE AVE. NO. SUITE 316 SEATTLE WA , 98109	50.000	LAKE HARRIS	2/12/1990
4-069-0022AM	BLANKENSHIP, H. L.	43.000		10/11/1984
4-069-0028A	SWEET BLOSSOM CITRUS CORP. P.O. BOX 129 FERNDALE FL , 34729	50.000		3/ 8/1988
4-069-0030A	WILLIS, WILLIAM J. P.O. BOX 636 CLERMONT FL , 34711	1.500		8/ 9/1985
4-069-0030AE	WILLIAM J. WILLIS P. O. BOX 636 CLERMONT FL , 34711	1.500	LITTLE LAKE HARRIS	10/ 8/1986
4-069-0077A	KENNETH M. BOYKIN 209 N. LAKE SHORE DRIVE MINNEOLA FL , 34755	10.000		/ /
4-069-0102A	C & C PEAT CO. P.O. BOX 443 MINNEOLA FL , 34755	17.000		7/10/1988
4-069-0102AM	RICHARD LANGLEY P. O. BOX 188 CLERMONT FL , 34711	66.000	LAKE HARRIS	/ /
4-069-0102AM2	RICHARD LANGLEY	66.000	LAKE HARRIS (CLASS I	7/10/1988
4-069-0102AM3	RICHARD LANGLEY	66.000		7/10/1988
4-069-0128A	POWERS DAIRY INC. P.O. BOX 157 DONA VISTA FL , 32784	332.000	PALATLAKAHA RIVER SY	10/ 8/1990

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
4-069-0136A	WILLIAM HAYNIE	0.250		8/13/1986
4-069-0137A	KENNETH & SARA BOYKIN P.O. BOX 38 MINNEOLA FL , 34755	29.000	NONE	4/ 8/1990
4-069-0171A	SUNSHINE PEAT INC P.O. BOX 7008 ORLANDO FL , 32854	26.000	ISOLATED WETLAND IMP	12/ 9/1991
4-069-0199A	THOMAS W. MERRITT RT 2 BOX 424 GROVELAND FL , 34736	75.000	WILSON MARSH (CLASS	2/ 9/1993
4-069-0260AG	FDOT-FLORIDA'S TURNPIKE ATTN: RAYMOND AHSE 605 SUWANNEE STREET TALLAHASSEE FL , 32399-0450	12.000	DILLY LAKE	10/ 8/1996
4-069-0264AG	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL , 32778	347.300	CHURCH LAKE; WHIT LA	4/ 7/1997
4-069-0264AGM	LAKE COUNTY BOARD OF COUNTY CO 315 WEST MAIN STREET TAVARES FL , 32778	46.600	LANDLOCKED BASIN, OK	3/10/1997
4-069-0301A	PRINGLE COMMUNITIES, INC. SOUTH HIGHWAY 27 26600 ACE AVENUE LEESBURG FL , 34748	0.000	PALATLAKAHA RIVER AN	/ /
4-8088	WHITE, LARRY	0.000		00/00/00
4-8089	WHITE, LARRY	0.000		00/00/00
40-069-0052A	BARCLAY LEALAND & PEDRO 3479 W WASHINGTON ORLANDO FL , 32801	73.000	HORSESHOE LAKE (CLAS	10/19/1992
40-069-0079A	JIM DURRANCE 18018 EAST APSHAWA ROAD CLERMONT FL , 32711	45.000	GROUNDWATER (CLASS I	12/ 5/1994
40-069-0082A	TRANSTECH INDUSTRIES INC. P.O. BOX 740670 NEW ORLEANS LA , 701740670	44.370	DILLY LAKE (CLASS II	12/12/1994
40-069-0093A	ARNOLD STROSHEIN SR. 10559 SPICEWOOD TRAIL BOYNTON BEACH FL , 33436	94.000	LAKE APOPKA, DOUBLE	1/ 8/1996
40-069-0120AG	LAKE COUNTY BOARD OF COUNTY CO 123 N. SINCLAIR AVE. TAVARES FL , 32778	2.900	CHURCH LAKE	2/22/1998
40-069-0138AG	STATE OF FLORIDA, DEPT. OF COR 2601 BLAIR STONE RD. TALLAHASSEE FL , 32399-2500	6.470	LAND-LOCKED DEPRESSI	6/10/1999
40-069-0154A	CARROLL FULMER & CO., INC. P. O. BOX 616300 ORLANDO FL , 328616300	16.540	UNNAMED LAKE, CLASS	/ /
6-069-0101A	L. NEAL SMITH MONTVERDE FL , 34756	21.000	LAKE APOPKA	/ /
6052478043	SCHLOSSER, W. A.	0.000		00/00/00
4-083-0006A	OCALA BUSINESS CENTER 7801 S.E. 58TH AVENUE OCALA FL , 32672	160.000		/ /
4-083-0006AE	OCALA BUSINESS CENTER	160.000	None - stormwater dr	1/ 8/1987
4-083-0006AE2	OCALA BUSINESS CENTER	160.000	COUNTY DITCHES	11/17/1990
4-083-0008A	T.F. RESEARCH FARM; INC. R.R. 1 BOX 485 OKLAWAHA FL , 32179	2,600.000	OKLAWAHA RIVER	/ /
4-083-0013A	SILVER SPRINGS ESTATES INC C/O 21 N. MAGNOLIA AVE OCALA FL , 32670	250.000		00/00/00

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
4-083-0031A	CHARLES WALTERS 1105 S.E. 3RD AVENUE OCALA FL , 32671	53.400		1/11/1986
4-083-0031AE	SMITH LAKE SHORES DEV.; INC. 1921 SW 7TH AVENUE OCALA FL , 32674	53.400	SMITH LAKE	4/ 7/1991
4-083-0042A	GENERAL DEVELOPMENT CORP.	497.000		2/ 7/1986
4-083-0042AE	GENERAL DEVELOPMENT CORP.	497.000	MARSHALL SWAMP	2/ 7/1991
4-083-0042AE2M	GENERAL DEVELOPMENT CORP.	142.000	NONE	3/11/1991
4-083-0042AE2M2	SILVER SPRINGS SHORES SUBD. AMREP SOUTHEAST INC. 930 SE FT KING ST POB1330 OCALA FL , 32678	0.800	J.D. YOUNG DIVERSION	2/13/1995
4-083-0042AE2M4	SILVER SPRINGS SHORES SUBD.	512.000		/ /
4-083-0042AE2M6	GENERAL DEV CORPORATION ATTN: R.S. MURALI 1111 SOUTH BAYSHORE DRIVE MIAMI FL , 33131	5.500	NONE	12/ 9/1991
4-083-0042AE2M7	GENERAL DEV CORPORATION	473.200	MARSHALL SWAMP (CLAS	12/13/1993
4-083-0042AE2M8	GENERAL DEVELOPMENT CORPORATIO ATTN: RODRIGUE-WALLING 111 SOUTH BAYSHORE DRIVE MIAMI FL , 33131	348.610	MARSHALL SWAMP (CLAS	8/ 8/1994
4-083-0042AE2M9	MARION COUNTY BOARD OF COUNTY 601 S.E. 25TH AVENUE OCALA FL , 32671	4.020	GROUNDWATER	6/ 9/1992
4-083-0042AEM	GENERAL DEVELOPMENT CORP.	267.000		2/ 8/1986
4-083-0064A	MARION CO BRD OF COMMISSIONERS 601 SE 25TH AVE OCALA FL , 32671	8,634.000		/ /
4-083-0071A	ROGER WOOD 1012 E. SILVER SPRINGS BLVD. OCALA FL , 32670	0.000		/ /
4-083-0079AG	COUNTY OF MARION 19 NW PINE AVE. OCALA FL , 32670	190.000		11/13/1989
4-083-0084A	ERNEST C. JURGENS JR. 7263 S.E. 110TH ST. BELLEVIEW FL , 32620	69.400	Isolated Surface dep	1/ 8/1990
4-083-0108AC	GENERAL DEVELOPMENT CORP.	852.000	MARSHALL SWAMP	9/ 9/1906
4-083-0123AG	FLORIDA DEPARTMENT OF TRANSPOR P.O. BOX 1089 LAKE CITY FL , 32056	9.820	OKLAWAHA RIVER (CLAS	9/ 8/1992
40-083-0038A	LEEWARD AIR RANCH PROPERTY OWN 7801 SE 58TH AVE. OCALA FL , 34480	84.920	2 ON-SITE PONDS, 1 O	9/11/1992
40-083-0041AG	CITY OF BELLEVIEW P. O. BOX 129 BELLEVIEW FL , 32620	4.200	N/A - ONSITE RETENTI	2/23/1993
40-083-0047A	GENERAL DEV CORPORATION	10.700	NO DISCHARGE/GROUNDW	7/ 5/1993
40-083-0053A	V. HAWLEY SMITH, JR. ONE SAN JOSE PLACE, #7 JACKSONVILLE FL , 32217	10.450	NO DISCHARGE TO SURF	10/28/1993
40-083-0076A	BAHIA OAKS INC SQUADRON 567 CO 7801 SOUTHEAST 58TH AVE. OCALA FL , 32671	89.000	STREETS AND DRAINAGE	8/22/1996
6-083-0005AG	DEPT. OF ARMY/COE P.O. BOX 429 PALATKA FL , 32177	0.010		4/13/1984
6-083-0010A	FLORIDA POWER CORPORATION	0.500	OKLAWAHA RIVER CANAL	11/13/1989

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
6-3033	MARTIN, KAYLE	0.000		00/00/00
4-083-0033A	BALLARD, LARRY E. 3650 NE 25TH ST. OCALA FL , 32670	48.100		11/ 8/1985
4-083-0035A	BALLARD, LARRY E.	29.600		/ /
4-083-0043A	DE MENZES, CHARLES 2116 E SILVER SPRG BLVD OCALA FL , 32670	60.000		/ /
4-083-0045A	ELLISON, DENVER L.	0.000		00/00/00
4-083-0088A	LARRY BALLARD 3650 N E 25TH STREET OCALA FL , 32670	39.000	OKLAWAHA RIVER	6/11/1990
4-083-0088AM	COUNTRYSIDE PARTNERS, INC. 4260 NE 35TH STREET OCALA FL , 32670	39.000	OKLAWAHA RIVER (CLAS	8/ 6/1995
4-083-0129A	CHARLES FORMAN 320 N.W. 3RD AVENUE OCALA FL , 32670	50.690	NO DISCHARGE/GROUNDW	4/12/1993
4-083-0130A	STEVEN H. GRAY, TRUSTEE 125 N.E. 1ST AVE. OCALA FL , 32670	141.700	SILVER RIVER (CLASS	5/ 9/1993
4-083-0130AM	GRAY, STEVEN H. 101 N.E. 1ST AVENUE OCALA FL , 32670	142.180	N/A	2/12/1996
4-083-0130AM2	JOHN M. CURTIS, TRUSTEE 101 N.E. 1ST AVENUE OCALA FL , 32670	142.180	N/A	2/11/1997
4-083-0132A	AVATAR PROPERTIES INC. 201 ALHAMBRA CIRCLE CORAL GABLES FL , 33134	653.000	NO DISCHARGE-GROUNDW	8/ 9/1993
4-083-0136A	CANDLER DEVELOPMENT CO 2500 WINDY BRIDGE PKWY #1560 MARIETTA GA , 30067	19.400	UNNAMED WETLAND (CLA	3/ 6/1994
4-083-0137A	STEVEN H. GRAY, TRUSTEE	205.350	SILVER CREEK (CLASS	11/15/1993
4-083-0137AM	STEVEN GRAY TRUSTEE 125 NE 1ST AVE SUITE 1 OCALA FL , 32678	295.350	SILVER RIVER (CLASS	9/12/1994
4-083-0141AG	MARION CNTY. 601 SE 25TH AVENUE OCALA FL , 32670	162.500	NO OFFSITE DISCHARGE	12/13/1993
4-083-0168A	R. WILLIAM FUTCH, TRUSTEE A/K/ 756 S.W. MARTIN LUTHER KING JR BLVD OCALA FL , 34474	39.970	WETLANDS	/ /
40-083-0093AG	MARION COUNTY BOARD OF COUNTY 601 S.E. 25TH AVENUE OCALA FL , 34471	68.630	ISOLATED DEPRESSIONS	3/31/1999
4-083-0081A	ROLLING GREENS PARTNERSHIP LTD 1815 GLENEAGLES ROAD OCALA FL , 32672	63.330	Existing stormwater	12/11/1989
4-083-0081AE	ROLLING GREENS COMMUNITIES, LT 1815 W. GLENEAGLES RD OCALA FL , 32672	63.330	N/A	2/13/1992
4-083-0092AG	CITY OF OCALA PO BOX 1270 OCALA FL , 32678	635.000	MARSHALL SWAMP	/ /
4-083-0100A	ERIC WAGNER 2065 NW 125 TERRACE ROAD SILVER SPRINGS FL , 32688	68.000	LAKE WALDENA	6/10/1991
4-083-0103AG	CITY OF OCALA FLORIDA 151 SE OSCEOLA AVENUE OCALA FL , 32678	1,700.000	DEAD RIVER THEN THE	8/11/1992

Permits for Management and Storage of Surface Waters (MSSW)

APPLICATION NUMBER	OWNER AND ADDRESS	PROJECT ACREAGE	RECEIVING WATER BODY	EXPIRATION DATE
4-083-0105AG	MARION COUNTY 111 S.E. 25TH AVENUE OCALA FL , 32672	20.000	NORTH LAKE	7/15/1991
4-083-0156AG	MARION COUNTY BOARD OF COUNTY 601 S.E. 25 AVENUE OCALA FL , 32671	1.621	N/A	/ /
40-083-0010A	FRANCIS GAY RT 2 BOX 400 SILVER SPRINGS FL , 32680	70.500		6/18/1990
40-083-0044A	CHARLES E. WALTERS 793 LITCHFIELD ROAD TALLAHASSEE FL , 32312	63.180	GROUNDWATER	9/ 2/1993
40-083-0047A	GENERAL DEV CORPORATION	10.700	NO DISCHARGE/GROUNDW	7/ 5/1993

Appendix F

Executive summaries or abstracts of reports developed as part of the UORB SWIM Program

Explanatory Note

This appendix contains, when available, executive summaries or abstracts of reports and publications that have been produced as a result of the projects listed in this SWIM Plan. Where no executive summary or abstract was included in a report, report conclusions have been substituted. For easy cross-reference, the project from which a report was generated is listed following the citation.

Brown, M.T., and R.E. Tighe. 1992. Vegetation composition and cover at Sunnyhill Farm. St. Johns River Water Management District Special Publication SJ93-SP8, Palatka, FL.

Project: OK-4-321-D Investigation of Marsh Restoration Techniques

SUMMARY

During the two growing seasons (1989-1990) that were subject to these field samplings since the change in water regimes, some general trends in successional patterns might be deduced:

- The soil seed bank seems to be depauperate of species characteristic of communities originally occupying the site. It is possible that this is simply a result of a lack of conditions conducive to the germination of such species. However, when one considers the amount of time that has elapsed since conversion to agricultural uses and the effects of such uses on the soil, this result is not surprising.
- A significant component of wetland herbaceous species have colonized the site in areas where water depths favor their establishment.
- In the two growing seasons observed, there was little change in species composition as measured at the transects. All of the marsh areas were dominated by floating and rooted aquatic species, with the same five or six species of greatest importance values throughout the site. There was a slight trend in increasing species richness over all sampling trips.
- Based on observations of successional patterns of the site, it is unlikely that the original (hypothesized) vegetation characteristic of the site will recolonize. If the original vegetation was saw grass (*Cladium jamaicense*), the changes in water quality, quantity and flow regimes, and the disturbance to soils may not be conducive to its re-

establishment. In addition, saw grass is known to be very difficult to germinate or transplant.

- Species richness tended to be greatest in those areas of lowest overall water depths. Transect 2 had highest overall richness because it had both submerged and "exposed" areas.
- Sites with mean water depths greater than 40 cm were dominated in large part by floating aquatics and rooted floating aquatics, and sites with mean water depths from 10 cm to 39 cm appeared to be favored by emergent vegetation.
- The mean depth for *Typha* spp. was 28.6 cm. It was not found in areas with inundation depths greater than 70 cm, but was found in "dry" areas where water depths were as much as 15 cm below the soil surface.

Crisman, T.L., J.R. Beaver, J.K. Jones, A.E. Keller, A.G Neugaard, and V. Nilakantan. 1992. Historical assessment of cultural eutrophication in Lake Weir, Florida. St. Johns River Water Management District Special Publication SJ 92-SP12, Palatka, FL.

Project: OK-4-125-D Lake Weir Eutrophication Study

CONCLUSIONS AND RECOMMENDATIONS

The watershed of Lake Weir has undergone substantial changes since land clearance by European settlers in the late 1800's. Although no direct evidence is available, the lake may have been oligotrophic or oligotrophic-mesotrophic prior to settlement of the watershed. Since the beginning of water quality monitoring in the 1970's, the lake has been in a mesotrophic state. Although conventional chemical indicators of trophic state do not indicate an acceleration of cultural eutrophication since the mid 1970's, biological parameters, especially those of the microbial loop, suggest that while the trophic state changes may be subtle, they are nevertheless occurring.

A paleolimnological assessment of lake sediments suggests that three watershed events have had the greatest impact on the trophic state of Lake Weir: land clearance in the late 1800's, installation of the weir in 1938, and a progressive expansion in human population following WW II. The initial land clearance by Europeans increased trophic state of the lake, but the impact was short lived and the lake returned to its baseline condition within 20-30 years. Unfortunately, the impact of the other two events have not shown such a trend.

The ecosystem response to the installation of the weir in 1938 was immediate. Within a short time, accumulation rates of organic and inorganic matter as well as total phosphorus in Lake Weir increased markedly, and biological parameters indicated a clear increase in cultural eutrophication. This single event resulted in the greatest proportional increase in trophic state at Lake Weir for at least the past 100 years.

Since the Second World War, human population has increased progressively at Lake Weir. Both our paleolimnological and Secchi disk investigations indicated that nutrient loading to the lake and associated cultural eutrophication are directly related to human population levels. Such a relationship reflects the fact that the entire watershed residential population is on septic systems.

Citrus agriculture appears to be only a minor nutrient loader to Lake Weir since the citrus killing freezes of the early 1980's, but our Secchi disk study suggested that runoff from new residential developments should be monitored closely and may soon be a major nutrient contributor to the lake. Agriculture in general, however, including vacant land, is still a major nutrient source for the lake. Future management plans should examine best management practices including vegetated swales, retention ponds for intercepting agricultural runoff before it enters the lake.

The cultural eutrophication of Lake Weir can not be stabilized and/or reversed without sound watershed management practices. Of prime concern is the nutrient contribution from an ever expanding human population. It is recommended that measures be taken to maximize minimum lot size requirements for near shore areas. Our Secchi disk survey indicated that water clarity is inversely proportional to the density of residences immediately onshore. Multiple family residences should be discouraged.

The most heavily populated segments of the Lake Weir watershed are in immediate need of centralized sewer facilities. In particular, the town of Oklawaha and shoreline residences of Little Lake Weir and Sunset Harbor.

While it can be argued that the entire lake system should eventually be ringed with a sewer system, such action should be approached cautiously. As commonly seen elsewhere, laxation of rules on population/housing densities often follow installation of sewer facilities. Given the fragile nature of the vegetated littoral zone in Lake Weir, increased boating activities associated with expanded population could have a marked negative impact on the lake.

It appears that residential development also contributes to nutrient loading to the lake via stormwater runoff. It is recommended that stormwater treatment systems be implemented both for existing and future development areas within the watershed. Even if such systems are constructed, ways must be found for insuring that they be properly maintained for effective water and nutrient interception.

In-lake management practices should concentrate on ways to protect the vegetated nearshore fringe. Such areas are essential for fish reproduction and serve as "kidneys" to trap nutrients leaching into the lake from septic systems. Destruction of macrophytes will likely lead to further increases in trophic state.

Residences should be encouraged to observe no wake zones and should be required to leave shorelines vegetated as a buffer from the erosive action of waves. Equally threatening to the littoral zone is construction of boat docks and boat houses. It is important that both the size and number of such structures be minimized to have the least negative impact on aquatic plants.

Finally, our field observations as well as those of several residents suggest that sea gulls may be an important nutrient loader to Lake Weir, especially during winter. Gulls commonly migrate inland during winter and congregate in large numbers on lakes. Such is the case at Lake Weir. Unfortunately, Lake Weir gulls appear to feed during the day at a nearby landfill and return to the lake during the evening. In the process, nutrient loading to the lake is increased via feces. It is recommended that the gull problem be examined as part of any comprehensive lake management plan.

Danek, L.J., T.A. Barnard, and M.S. Tomlinson. 1991. Bathymetric and sediment thickness analysis of seven lakes in the Upper Oklawaha River Basin. St. Johns River Water Management District Special Publication SJ 91-SP14, Palatka, FL.

Project: OK-4-124-D Bathymetric and sediment depth mapping of major lakes

EXECUTIVE SUMMARY

A bathymetric and sediment thickness survey was conducted on seven lakes in the Upper Oklawaha River Basin (UORB) in November and December 1990. The lakes that were surveyed included Lake Beauclair, Lake Dora, Lake Eustis, Lake Griffin, Lake Harris, Lake Weir, and Lake Yale. The bathymetric portion of the study was conducted using an Innerspace model 448 fathometer, a Del Norte model 540 precision microwave navigation system, and an onboard computer for data logging and navigation. For sediment thickness surveys, a second vessel was equipped with LORAN-C navigation and a sediment piston corer for measuring sediment thickness. For deeper sediments [greater than 6 to 10 feet (ft) thick] a sediment-penetrating rod was used to measure sediment thickness.

The surveys were conducted along a 1,000-ft grid on each lake. Additional depth readings between grid points were added to the database in areas where rapid changes in the depth occurred. A total of 3,093 depth readings and 2,190 sediment thickness measurements were processed. The data were calibrated, corrected for water level variations during the survey, and plotted and contoured to produce bathymetric and sediment thickness maps. The data were further processed using ARC/INFO to produce hypsographic curves relating lake water level to lake volume and surface area. The sediment data were used to produce curves relating sediment volume and surface area to sediment thickness in each lake.

The calculated lake water volumes varied from a low value in Lake Beauclair of 0.319 x 10^9 cubic feet (ft^3) to a high in Lake Harris of 9.781 x 10^9 ft^3. The average depth in the lakes varied from 18.9 ft for Lake Weir to 6.7 ft for Lake Beauclair. The deepest points observed were 31.7 ft in Lake Harris and 31.9 ft in Lake Weir. The surface areas in the lakes varied from 47.3 x 10^6 square ft (ft^2) for Lake Beauclair to 814.1 x 10^6 ft^2 for Lake Harris and Little Lake Harris. The depth values and lake volumes reported assume that the top of the flocculent layer is the lake bottom and do not account for interstitial water in the flocculent sediments.

The soft sediments were generally thickest near the central basins with a perimeter of exposed sand bottom between the soft sediments and the shoreline. The average thickness of the soft sediments varied between 4.68 ft for Lake Dora and 8.59 ft for Lake Harris. Lake Harris contained the largest volume of soft sediments with 6.797 x 10^9 ft^3 which covered 96.8 percent of the bottom. The thickest soft sediments were also recorded in Lake Harris with a sediment thickness of 29 ft. All of the lakes had areas where the sediments exceeded 15 ft thick except Lake Weir, where the maximum thickness was 12.5

ft. The total volume of soft sediment calculated for the seven lakes (excluding connecting waterways, adjacent bays, marshes, etc.) is 13.9 x 10^9 ft^3 as compared to the total water volume in the lakes of 25.77 x 10^9 ft^3.

The following table summarizes the bathymetric and sediment data collected for each of the seven lakes.

Lake	Surface Area (ft^2 x 10^6)	Water Volume (ft^3 x 10^6)	Mean Water Depth	Sediment Area (ft^2 x 10^6)	Sediment Volume (ft^3 x 10^6)	Mean Sediment Depth	% Sediment Cover
Beauclair	0.0473	0.3187	6.73	0.0353	0.1836	5.20	75.09
Dora	0.1910	1.8814	9.85	0.1623	0.7598	4.68	85.00
Eustis	0.3379	3.8337	11.34	0.3143	2.0967	6.67	93.01
Griffin	0.4100	3.1752	7.74	0.3920	2.2521	5.75	95.60
Harris	0.8141	9.7810	12.01	0.7881	6.7972	8.59	96.81
Weir	0.2449	4.6384	18.94	0.1796	0.8491	4.72	73.32
Yale	0.1751	2.1441	12.25	0.1557	0.9632	6.19	88.91

Godwin, W.F., S.G Coyne, and E.A. Gisondi. 1993. An evaluation of methods for removal of rough fish as a restoration technique for Lake Apopka. Department of Surface Water Programs, Tech. Mem. No. 3, St. Johns River Water Management District, Palatka, FL.

Project: OK-2-361-M Lake Denham Biomanipulation

EXECUTIVE SUMMARY

The declining environmental quality of surface water in the Ocklawaha River basin, and particularly in Lake Apopka, has been a subject of concern for various agencies and private citizens for over 40 years.

In recognition of the persistent poor water quality and associated environmental problems in this basin, the 1985 Florida legislature directed the St. Johns River Water Management District, in conjunction with the Florida Department of Environmental Regulation, other state and local agencies, and the Lake Apopka Restoration Council, to initiate a pilot restoration program for Lake Apopka. This mandate was reiterated through the Surface Water Improvement and Management Act of 1987.

One potential method considered for the restoration of Lake Apopka was manipulating lake trophic structure (food chain composition) and exporting in-lake nutrients by depleting planktivorous fish stocks, primarily gizzard shad. Establishing an efficient and cost-effective method for removing target fish species was essential in implementing this restoration technique, and an accurate assessment of existing rough fish stocks was necessary in determining the efficacy of various fish removal methods tested.

This project had three major goals. First, to determine the biomass of harvestable gizzard shad stocks in Lakes Denham and Apopka. Second, to test the effectiveness of fishing techniques in Lake Apopka which are most often used for harvesting open-water fish stocks such as gizzard shad. Third, to estimate the cost and extent of nutrient export from fish removal and compare the results with other potential methods.

The District in cooperation with the Florida Game and Fresh Water Fish Commission initiated an effort to test methods for determining gizzard shad biomass, and to evaluate techniques for shad removal. Three fish removal techniques were selected for testing: haul seine, gill net, and pound net. Two basic principles were established to guide this effort: (1) an acceptable rough fish removal method must be practical and specifically applicable to Lake Apopka and (2) use of fish toxicant is not a viable option for rough fish depletion because of the negative impact of leaving large masses of dead fish to decompose in the lake with attendant nutrient release.

Use of a small lake for the pilot fish removal effort resulted in much lower cost for the work and allowed better control of the fish removal process. The selected lake, Lake

Denham (256 acres), is near Lake Apopka and was similar in trophic state and food-web structure.

Standard fish sampling techniques using blocknets with rotenone and experimental gill nets of mixed mesh sizes were found to be inadequate to provide accurate information on the abundance of gizzard shad in either Lake Denham or Lake Apopka; therefore, information on the composition of the total fish stock was not available for either lake and only limited information was available on gizzard shad biomass. In Lake Denham, blocknets showed a total gizzard shad biomass of 7 to 21 lb/acre during the same time period when 417 lb/acre of adult gizzard shad were removed from the lake by haul seine. Blocknet data from Lake Apopka were also highly variable and showed similar low biomass levels. Experimental gill net catches showed high variability with the season of the year. Gill net catch results from both Lake Denham and Lake Apopka did not appear to be density dependent. For example, the experimental gill net catch in Lake Denham showed an 84 to 89 percent decline between the months of January and June each year before and after the fish removal. Results from Lake Apopka samples also showed high seasonal variability.

Because direct census of gizzard shad populations was not feasible using blocknets or gill nets, we used Lake Denham haul seine catch and effort data to estimate the abundance of harvestable gizzard shad in that lake at the beginning and end of the haul seine work by using a standard mathematical equation (Leslie Regression). This could not be done in Lake Apopka because the haul seine was ineffective there. In lieu of numeric data we used anecdotal information and an assumed relationship between experimental gill net and haul seine catches to project a harvestable gizzard shad stock for Lake Apopka of about 10 million pounds.

In Lake Denham, 35 seine hauls completed between January and April 1990 produced a total fish catch of 112,437 lb. Of this total, 87,057 lb (77 percent) were gizzard shad. Game fish species comprised 19 percent of the catch and other rough fish made up the remainder. A Leslie Regression analysis of 1990 haul seine catch and effort data showed an initial harvestable gizzard shad stock of 100,794 lb or 394 lb/acre of lake surface. The harvestable stock remaining after completion of the haul seine effort was estimated at 13,737 lb or 54 lb/acre. In 1991, 13 seine hauls completed in May produced a total fish catch of 20,895 lb. Gizzard shad made up 96 percent (20,040 lb) of the total. The remainder of the catch was game fish species and other rough fish species. A Leslie Regression analysis of 1991 haul seine catch and effort data showed an initial harvestable gizzard shad stock of 22,679 lb or 88 lb/acre of lake surface. The harvestable stock remaining after completion of the 1991 haul seine effort was estimated at 2,639 or 10 lb/acre.

An analysis of 1990 Lake Denham haul seine catch data indicated that the initial adult gizzard shad stock was depleted by 86 percent. In 1991, the existing adult shad stock was depleted by 88 percent. The average cost of contracted fish removal by haul seine in Lake Denham was $0.26 per pound in 1990. A total of 609 lb of phosphorus and 1,915 lb

of nitrogen were exported from Lake Denham by this fish removal. The contract cost of nutrient removal was $36.32 per lb for phosphorus and $13.62 per lb for nitrogen. Contract cost for the 1991 fish removal was inflated ($0.36 per pound) because only one contractor submitted a bid for the work; therefore, nutrient removal cost was not calculated for the 1991 haul seine work.

In Lake Apopka, 12 seine hauls were completed during a 3-week period in April and May 1990. The harvest of gizzard shad from this effort was only 3,475 pounds, even though some hauls covered an area of 160 acres. Because of the small haul seine catches in Lake Apopka, the data were not suitable for any meaningful analysis. Reasons for the low catch efficiency included high fish escapement due to the slow rate of seine closure in the flocculent sediments, and the haul seine contractor's lack of detailed knowledge of fish and sediment distribution in Lake Apopka. The contractor was unable to compensate for these problems within the time and budget constraints of this contract.

Two commercial gill nets totaling 400 yards in length were used for fish removal trials in Lake Apopka during a 9-day period in January and February 1991 and a 13-day period in May 1991. In 184 hours of fishing effort, 40,521 pounds of fish were harvested. The catch by weight was composed of about 96 percent gizzard shad, 3 percent other rough fish, and almost 1 percent game fish. All game fish taken in the gill nets were of harvestable size. Initial mortality of game fish released from the gill nets averaged less than 10 percent and occurred only during the warm weather period (May). No estimate of longer term mortality of released fish was made. The cost of contracted rough fish removal by this method was $0.25 per pound. This figure is inflated due to the lack of competitive bidding for this fish removal contract. Many gizzard shad fishing operations routinely harvest fish by gill net at a market price of $0.08 to $0.15 per pound.

We used comparative data from experimental gill nets in Lakes Denham and Apopka, the 1990 Lake Denham haul seine catch data, and reported catch efficiencies for gill net fisheries on migratory species to predict a potential annual shad removal of about 3-million pounds for Lake Apopka. Use of gill nets appears to offer the best potential to achieve the target fish removal. However, this activity must be approved and permitted by the Florida Game and Fresh Water Fish Commission. Their evaluation of the impact of the game fish by-catch from gill nets will likely determine the future use of this fish removal method in Lake Apopka.

Cost for removal of nutrients by gizzard shad harvesting appear to be lower than most other methods and fish removal appears to be less problematic than other lake restoration alternatives associated with nutrient reduction such as sediment removal, pumped drawdown, alum treatment, or biochemical and chemical oxidation technology. We project that rough fish harvesting could remove about 11 tons of phosphorus and 33 tons of nitrogen annually from Lake Apopka. Although this level of nutrient depletion alone will have only small effects on overall nutrient dynamics for

the lake, it could augment significantly the projected annual phosphorus removal of 33 tons resulting from operation of a large water filtration wetland located adjacent to the lake. The large-scale removal of gizzard shad could also produce beneficial food web effects in the lake.

Heaney, J.P., S. Kenner, C. Cosio, and M. Fowler. 1991. General methodology for evaluating the socio-economic impacts associated with water resources projects. Report to St. Johns River Water Management District.

Project: OK-4-353-F Socioeconomic Basin Engineering Study

SYNTHESIS OF FINDINGS

Using the Florida Department of Revenue's land use classification system, a total of 23 land uses were evaluated, i.e., four residential, one commercial, 13 agricultural, one public, and four natural. For each of these land uses, the assessed values are estimated.

Median market values per acre for residential uses range from $30,000 to $150,000 depending on the type of land use. Market values for agriculture range from $500 per acre for unimproved timberland to $4,500 per acre for ornamentals. Public lands are valued assuming that they are in urban areas. The results of our analysis indicate that rivers and lakes have capitalized values of $8,000 per acre reflecting their enhancement of nearby property values and their recreational values. Land disposal of sewage yields a net value for these lands of $9,000 per acre based on the cost of the next best alternative. Lastly, unmodified wetlands have a very low market value of about $250 per acre.

If these wetlands are provided with water control, then their market value would be the value of the intended use, e.g., draining a wetland and converting it to residential use would enhance its value to $30,000 per acre. The annual rent or economic income is the market value of the land times a capitalization factor. A value of .10 was used.

While provision of water supply, drainage, and water quality control is an important factor in enhancing land values, other factors must also be considered. For example, in an urban area, the value of the land reflects the entire infrastructure including transportation, schools, parks, etc. The only way to derive the separate value of water is to do a complicated multiple product accounting with appropriate rules for allocating costs.

For urban and commercial areas, a lower bound on their benefits is the amount that they are currently paying for these services. The cost of an urban water supply at a rate of $1.00 per 1000 gallons, is about $300 per acre for a typical population density. A like amount can be assumed for wastewater treatment. Lastly, stormwater utilities charge about $3.00 per month per family. Assuming two families per acre yields an annual charge of $72/acre. Thus, for these direct water services alone, the estimated annual benefits are at least $672 per acre.

The market values for residential, commercial, and industrial land uses reflect the cost of providing wastewater and some stormwater quality control. However, since agriculture has been exempt from nonpoint pollution control regulations, this factor has not been reflected in their market prices. This cost may reduce their market value by 10 to 50 percent depending upon the severity of the regulations.

Annual quantities of drainage water range from 5 inches for unimproved timberland to 83.98 inches for ornamentals.

The unit rents for urban and commercial rents are the highest with values exceeding ten dollars per 1000 gallons. Corresponding values for agricultural uses range from $0.16 per 1000 gallons for vegetables grown in muck soils to $0.52 per 1000 gallons for unirrigated citrus.

RECOMMENDATIONS

With increased public awareness and concern regarding the quantity and quality of water, and with wise expenditures of very limited public funds, it is essential to develop reliable measures of the value of services produced by the St. Johns River Water Management District.

Using the state and county tax assessor's databases along with information from a variety of groups within the District, it is possible to develop a reliable procedure for doing socioeconomic evaluations.

The methodology in this report should be viewed as a logical starting point for the implementation of such procedures. To be most effective, they need to be integrated with sound continuous simulation models that include the hydrologic and engineering aspects of the studies.

United States Army Corps of Engineers. 1995 Section 1135 Project modification report and environmental assessment. Ocklawaha River, Florida. Department of the Army, Corps of Engineers, Jacksonville District, Jacksonville, FL.

Project: OK-2-322-M Sunnyhill Wetland Restoration

SYLLABUS

This report summarizes the engineering and environmental efforts required for implementing the Section 1135 wetland restoration plan of the Ocklawaha River, Marion County, Florida. The purpose of the project is to restore wetlands which were drained after the construction of canal C-231 and to improve the quality and quantity of fish and wildlife habitat. The wetlands will be created by diverting flow from the existing canal C-231 into the historic Ocklawaha River. Three water control structures are included in the project features to assist in creating an environment conducive to wetlands creation. Approximately 2,800 acres of wetlands will exist on the area east of the Ocklawaha River between Moss Bluff and Starkes Ferry, and approximately 4,100 wading birds are expected to frequent the basin following implementation of the recommended alternative. Additionally, an analysis of phosphorus retention by wetland systems indicates that creating a flow through system will provide an improvement in water quality for the historic river. Implementation of the project modification has a total estimated cost of $4,932,340.

CONCLUSIONS

The four alternatives selected for study were evaluated on the basis of environmental benefits and project goals met. Under these analyses, Plans 1, 2, and 4 were eliminated on the grounds that they produced less environmental benefits. Plan 3 was determined to be the plan producing the greatest environmental benefits, as required under Federal guidelines for water resources development.

Plan 3 includes restoring 48,900 linear feet of the historic Ocklawaha River extending from Moss Bluff Lock and Dam to Starkes Ferry. The re-establishment of approximately 2,806 acres of floodplain wetlands on the east side of the C-231 Canal will be accomplished by allowing water to flow unimpeded through the area.

Plan 3 includes three water control structures to re-create a natural flow regime. Located at the intersection of the historic channel and the C-231 Canal, an inlet structure, B-1, consists of four seventy-two inch corrugated metal pipes with slide gate control. Riprap will be provided 30 feet upstream and 60 feet downstream of this structure. An outlet structure, E-1, located downstream of Moss Bluff Lock and Dam, consists of a sheet pile weir 50 feet in length. A stilling basin is also located downstream of the weir to dissipate energy, and riprap is provided 20 feet upstream and downstream of the structure. Located upstream of E-1 at the intersection of the rim ditch and the historic channel, a grade structure, E-2, consists of a sheet pile weir 150

feet in length with stop log risers. Riprap will be provided 20 feet upstream and downstream of the structure.

From structure B-1 to the B-C levee, dredging will be required to re-establish the channel. In Area D, ditches which cut off oxbows will be plugged to emulate the sinuosity of the historic channel, and approximately 50,000 cubic yards of muck will be removed and placed behind the east levee. In order to achieve current velocities closer to historic conditions, 13 sections of the river channel between structure E-2 and the C-D levee will be steepened with side slopes of 3 (horizontal): 1 (vertical). Levees A-B, B-C, C-D, and interior levees will be pushed into adjacent ditches to establish an uninterrupted floodplain in Areas A-D.

This plan appears to be in the best overall public interest and is the most beneficial environmental plan for implementation. This plan meets the designated criteria for participation by the Federal Government in project modifications for wetland restoration. It also conforms to the guidelines for Federal water resource project development as provided under the Principles and Guidelines. There are no plans more cost efficient identified that address the primary study objectives and achieve significant wetland restoration for the area. The impacts of the proposed plan are deemed beneficial overall and the plan is considered to be in full compliance with all pertinent environmental statutes as well as other Federal laws and directives regarding water resource project development.

Pertinent economic data for the recommended plan are as follows:

Estimated Federal Cost	$3,170,000
Estimated Non-Federal Cost	$1,760,000
Total Estimated Cost	$4,930,000

Based on an analysis of overall economic, environmental, and social impacts, the above plan was found to be in the Federal interest and justified for implementation. Therefore, this project modification plan for the wetland restoration of the Ocklawaha River is recommended for approval for Federal construction.