FINAL

BASIN MANAGEMENT ACTION PLAN

for the Implementation of Total Maximum Daily Loads for Total Phosphorus by the Florida Department of Environmental Protection in Lake Okeechobee

developed by the
Division of Environmental Assessment and Restoration
Water Quality Restoration Program
Florida Department of Environmental Protection
Tallahassee, FL 32399

in cooperation with the
Lake Okeechobee Stakeholders

December 2014

ACKNOWLEDGMENTS

The *Lake Okeechobee Basin Management Action Plan* was prepared as part of a statewide watershed management approach to restore and protect Florida's water quality. It was developed with participation from affected local, regional, and state governmental interests, identified below; elected officials and citizens; and private interests.

LIST OF LAKE OKEECHOBEE BASIN MANAGEMENT ACTION PLAN PARTICIPANTS

TYPE OF GOVERNMENTAL OR PRIVATE ENTITY	PARTICIPANT
Counties	Glades Highlands Martin Okeechobee Orange Osceola Polk
Municipalities	City of Avon Park City of Kissimmee City of Edgewood City of Okeechobee City of Orlando City of Sebring
Special Districts	Okeechobee Utility Authority Istokpoga Marsh Watershed Improvement District Reedy Creek Improvement District Spring Lake Improvement District
Agencies	Florida Department of Agriculture and Consumer Services Florida Department of Environmental Protection South Florida Water Management District Southwest Florida Water Management District St. Johns River Water Management District Florida Department of Transportation District 1 Florida Department of Transportation District 4 Florida Department of Transportation District 5
Other Interested Parties	Agriculture Archbold Biological Station Audubon of Florida Conservancy of Southwest Florida Everglades Foundation Florida Fruit and Vegetable Association Florida Farm Bureau Lee County Board of County Commissioners Lykes Ranch Natural Resources Conservation Service One Florida Foundation Soil Water Engineering Technology, Inc. Southeast Milk, Inc. Sugar Cane Growers Cooperative of Florida

For additional information on Total Maximum Daily Loads and the watershed management approach in Lake Okeechobee, contact:

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LIST OF ACRONYMS AND ABBREVIATIONS

ACF	Autosampler Flow-Corrected
ACT	Autosampler Composite Time Proportional
ac-ft	Acre-Feet
BMAP	Basin Management Action Plan
BMP	Best Management Practice
CDS	Continuous Deflective Separation (Unit)
CERP	Comprehensive Everglades Restoration Plan
CIB	Curb Inlet Basket
C&SF	Central and South Florida
CY	Calendar Year
DEM	Digital Elevation Model
Department	Florida Department of Environmental Protection
du/ac	Dwelling Units per Acre
DWM	Dispersed Water Management
EAA	Everglades Agricultural Area
EAAEPD	Everglades Agricultural Area Environmental Protection District
ERP	Environmental Resource Permit
F.A.C.	Florida Administrative Code
FAVT	Floating Aquatic Vegetation Treatment
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FLUCCS	Florida Land Use and Cover Classification System
FRESP	Florida Ranchlands Environmental Services Project
F.S.	Florida Statutes
FWRA	Florida Watershed Restoration Act
FYN	Florida Yards and Neighborhoods
GIS	Geographic Information System
HWTT	Hybrid Wetland Treatment Technologies
IDS	Integrated Delivery Schedule
kg/yr	Kilograms per Year
lbs/yr	Pounds per Year
LOPA	Lake Okeechobee Protection Act
LOPP	Lake Okeechobee Protection Plan
LOW	Lake Okeechobee Watershed
LOWCP-P2TP	Lake Okeechobee Watershed Construction Project Phase II Technical Plan
MOS	Margin of Safety
MOU	Memorandum of Understanding
MS4	Municipal Separate Storm Sewer System
MSTU	Municipal Services Taxing Unit
MT	Metric Tons
MT/yr	Metric Tons per Year
NEEPP	Northern Everglades and Estuaries Protection Program
NE-PES	Northern Everglades Payment for Environmental Services
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
OAWP	Office of Agricultural Water Policy

PES	Payment for Environmental Services
ppb	Parts per Billion
POR	Period of Record
POTW	Publicly Owned Treatment Works
PSAs	Public Service Announcements
SFWMD	South Florida Water Management District
SRF	State Revolving Fund
SSURGO	Soil Survey Geographic Database
STORET	Storage and Retrieval (Database)
SWET	Soil and Water Engineering Technology, Inc.
SWIM	Surface Water Improvement and Management
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
UF-IFAS	University of Florida Institute of Food and Agricultural Sciences
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
WAM	Watershed Assessment Model
WBID	Waterbody Identification (Number)
WCD	Water Control District
WOD	Works of the District
WRP	Wetland Reserve Program
WY	Water Year

EXECUTIVE SUMMARY

LAKE OKEECHOBEE WATERSHED

Lake Okeechobee is the largest lake in the southeastern United States. It is a shallow, eutrophic lake with an average depth of nine feet (South Florida Water Management District [SFWMD] *et al.* 2014; Florida Department of Environmental Protection 2001). It is vital to the state of Florida and its residents. Lake Okeechobee is a large, multipurpose lake that provides drinking water for urban areas, irrigation water and frost protection for agricultural lands, recharge for aquifers, fresh water for the Everglades, habitat for fish and wildlife, flood control, navigation, and many recreational activities (Department 2001).

Lake Okeechobee and the associated Lake Okeechobee Watershed (LOW) are primarily located in subtropical south central Florida in Glades, Hendry, Highlands, Martin, Okeechobee, Orange, Osceola, Palm Beach, and Polk Counties (see **Figure ES-1**). The LOW is divided into nine sub-watersheds, as follows:

- Upper Kissimmee.*
- Lower Kissimmee.*
- Taylor Creek/Nubbin Slough.*
- Lake Istokpoga.*
- Indian Prairie.*
- Fisheating Creek.*
- East Lake Okeechobee.
- West Lake Okeechobee.
- South Lake Okeechobee.

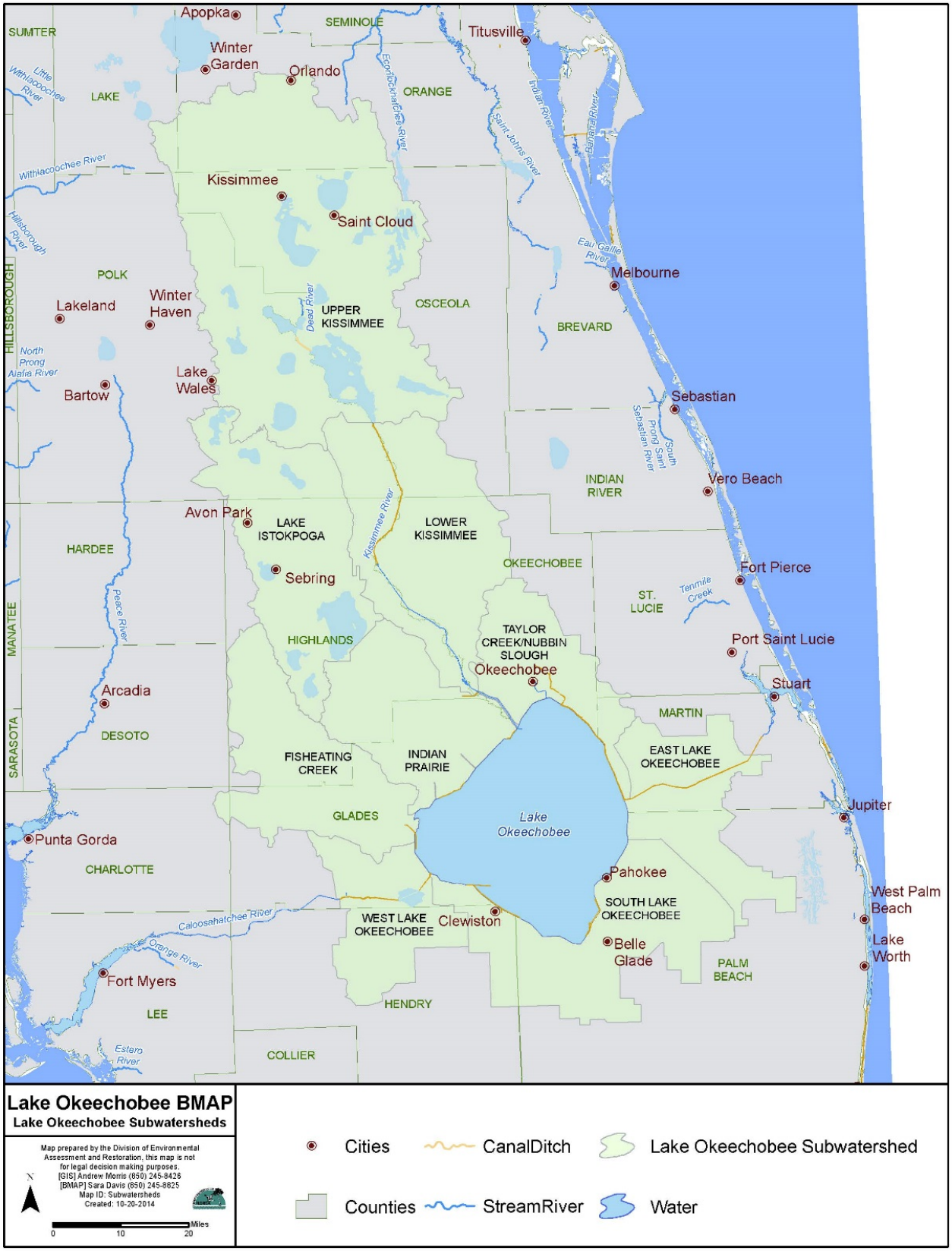

FIGURE ES-1: LAKE OKEECHOBEE WATERSHED

Lake Okeechobee and its watershed have been subjected to anthropogenic, hydrologic, and land use modifications over the past century that have led to a degradation of its water quality. To help address the nutrient impairment, the Department adopted a Total Maximum Daily Load to identify the target load for total phosphorus (TP) discharges to the lake. This Basin Management Action Plan represents the joint efforts of multiple stakeholders to identify and implement projects that ultimately achieve the TP TMDL for Lake Okeechobee.

The BMAP will be implemented, reviewed, and periodically updated to consider new science and incorporate additional load reductions. Although the BMAP encompasses the entire LOW, for this first BMAP phase, the Department is focusing on project implementation in the six sub-watersheds north of Lake Okeechobee. Each of these focus sub-watersheds is indicated in the list above by an asterisk. For calendar years (CY) 2001–12, these northern sub-watersheds contributed approximately 89.1% of the TP load and 88.3% of the discharge to Lake Okeechobee (SFWMD *et al.* 2014). Not only do the three southern sub-watersheds contribute a comparatively smaller percentage of overall loadings to the Lake Okeechobee, flow from these sub-watersheds into the lake is largely diverted in directions other than towards the lake. The three southern sub-watersheds have other existing regulatory programs, including the SFWMD's Chapter 40E-63, Florida Administrative Code (F.A.C.) and/or the Florida Department of Agriculture and Consumer Services (FDACS) Best Management Practices (BMP) Program. The three southern sub-watersheds are included in this BMAP, and the projects listed in **Section 5.11** will continue under this BMAP. However, these sub-watersheds will be further evaluated in future phases of BMAP implementation consistent with Subparagraph 403.067(7)(a)(1), Florida Statutes (F.S.).

TOTAL MAXIMUM DAILY LOADS

TMDLs are water quality targets that are based on state water quality standards for specific pollutants, such as phosphorus. The TMDL for Lake Okeechobee covers nine segments with waterbody identification (WBID) numbers within the lake: 3212A, 3212B, 3212C, 3212D, 3212E, 3212F, 3212G, 3212H, and 3212I. In August 2001, the Department adopted the TP TMDL for Lake Okeechobee. The TMDL proposed a load of 140 metric tons per year (MT/yr) of phosphorus to Lake Okeechobee. The attainment of the TMDL will be calculated using a five-year rolling average of the monthly loads calculated from measured flow and concentration values. Of the 140 MT/yr, 35 MT/yr of TP are estimated to fall directly on the lake through atmospheric deposition; therefore, 105 MT/yr of TP is the load allowed from the LOW and its associated land uses to meet the Lake Okeechobee TMDL. As authorized by Subsection 403.067(7)(a)2, F.S., the 105 MT/yr of TP is allocated to the entire LOW, which consists of

nine sub-watersheds. As the Department refines its load estimation model, sub-watershed expectations may be developed for future BMAP iterations.

LAKE OKEECHOBEE BMAP

Subparagraph 403.067(7)(a)1, F.S., authorizes the Department to adopt BMAPs that provide for phased implementation of the strategies necessary to ultimately achieve the associated TMDLs. This approach allows the Department to work with stakeholders to incrementally plan, budget, and execute projects to reduce nutrient loads while simultaneously monitoring and conducting studies to better understand the water quality dynamics (sources and response variables) in the watershed. For this first BMAP phase, the project reductions are spread over approximately a ten-year time frame in order for the Coordinating Agencies—the Department, SFWMD, and FDACS— to include long-term projects and develop additional projects to help meet the TMDL. Additional reductions will be included in future BMAP updates to help meet the TMDL. Periodic updates to the BMAP will be conducted during the ten-year time frame, as necessary and appropriate. At a minimum, the first periodic update will be initiated when the Watershed Assessment Model (WAM) is ready for use, in CY2017. The Department requested that the stakeholders provide information on activities and projects that would reduce nutrient loadings. The outputs from the WAM were used to develop a load estimation tool for the calculation of watershed, sub-watershed, and project existing loads, as well as nutrient reduction benefits associated with stakeholder projects.

The existing load for the three southern sub-watersheds will be determined after the completion of the WAM updates and incorporated into the next phase of the BMAP. This BMAP includes projects in the six northern sub-watersheds that will achieve a TP reduction of approximately 145.8 to 148.1 MT/yr. Of this, a 100.0 MT/yr reduction will be achieved through projects that will be completed, and the remaining 45.81 to 48.13 MT reduction will be completed after further development. Additional projects will be required to achieve the TMDL, and the Coordinating Agencies, in conjunction with local stakeholders, will continue to develop and identify new projects. As needed, the Department and the stakeholders will periodically evaluate progress and make adjustments using adaptive management to meet the remainder of the reductions to achieve the TMDLs.

Although the Lake Okeechobee TMDL addresses only TP, total nitrogen (TN) TMDLs and BMAPs are in place for the Caloosahatchee and St. Lucie Estuaries, which receive flows directly from Lake Okeechobee. Based on the data currently available to the Department, the TN annual geometric means do not exceed the Numeric Nutrient Criteria (NNC) values for the Lake Okeechobee WBIDs. However, the Department has calculated project reduction benefits for TN, where information was available, to track

these efforts. To date, the projects submitted by the stakeholders, for which TN reductions could be quantified, will achieve an estimated 123.1 MT/yr of reduction in TN. This estimate does not include the reductions for projects under development by the Coordinating Agencies. The TN existing load as calculated by the load estimation tool is 6,375 MT/yr.

The tables below show the TP reductions in MT/yr and kilograms per year (kg/yr) for the projects identified in each of the six northern sub-watersheds since 2009 (**Table ES-1, Table ES-2, Table ES-3**, **Table ES-4, Table ES-5,** and **Table ES-6**). The Department recognizes that stakeholders throughout the watershed have implemented stormwater management projects as well as statutorily mandated diversions away from Lake Okeechobee prior to 2009 and that these efforts have benefitted water quality. However, the BMAP focuses on efforts completed, planned, or ongoing since 2009. **Table ES-7** shows the projects that are currently under development by the Coordinating Agencies, and the reductions shown are coarse estimates developed with the best available information. These reductions will be revised as additional information is made available. **Table ES-8** lists the estimated reductions achieved to date, as well as the expected estimated reductions shown in **Table ES-7** for the northern six sub-watersheds. Note that the TMDL is allocated to the entire watershed, which includes all nine sub-watersheds. **Table ES-9** provides information on other initiatives as well as the time frames associated with these efforts. All of the details related to this information can be found in **Appendix A**. **Chapter 5** includes the projects that were submitted by the LOW stakeholders, and **Section 5.11** details the projects for the three southern sub-watersheds that have been ongoing, including diversions and BMP implementation. Nutrient reduction benefits for these projects will be calculated once the WAM enhancements are complete.

TABLE ES-1: FISHEATING CREEK SUB-WATERSHED PROJECTS

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	TYPE	STATUS	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)
FDACS-4	Fisheating Creek	FDACS	Floating aquatic vegetation treatment (FAVT)	In Progress	8.59	8,595
SFWMD-18	XL Ranch (Lightsey)	SFWMD	Dispersed water management (DWM)	Operational	0.07	71
SFWMD-20	Blue Head Ranch	SFWMD	DWM	Design/ Permitting	0.72	724
SFWMD-21	Nicodemus Slough	SFWMD	DWM	Under Construction	3.25	3,249
GC-1, HC-1	Urban and Municipal BMPs	Glades County, Highlands County	Public education/outreach	Ongoing	0.04	43
N/A	100% BMP Implementation	FDACS	Implementation of BMPs on all agricultural lands without current notices of intent (NOIs)	Started, Completed, Ongoing	5.88	5,881
N/A	Cost-Share BMP Implementation	FDACS	Implementation of cost-share BMPs	Started, Completed, Ongoing	0.27	268
TOTAL	**N/A**	**N/A**	**N/A**	**N/A**	**18.82**	**18,830**

TABLE ES-2: INDIAN PRAIRIE SUB-WATERSHED PROJECTS

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	TYPE	STATUS	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)
SFWMD-10	West Waterhole Marsh	SFWMD	DWM	Operational	4.17	4,166
SFWMD-12	Buck Island Ranch	SFWMD	DWM	Operational	1.09	1,087
IMWID-1	Istokpoga Marsh Watershed Improvement District Stormwater Treatment Area (STA)	Istokpoga Marsh Water Improvement District/Highlands County, SFWMD, Department, FDACS	STA	Planned, Funded	0.7	698
GC-2, HC-2	Urban and Municipal BMPs	Glades County, Highlands County	Public education/ outreach	Ongoing	0.07	68
N/A	100% BMP Implementation	FDACS	Implementation of BMPs on all agricultural lands without current NOIs	Started, Completed, Ongoing	5.66	5,665
N/A	Cost-Share BMP Implementation	FDACS	Implementation of cost-share BMPs	Started, Completed, Ongoing	0.28	282
TOTAL	**N/A**	**N/A**	**N/A**	**N/A**	**11.97**	**11,967**

TABLE ES-3: LAKE ISTOKPOGA SUB-WATERSHED PROJECTS

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	TYPE	STATUS	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)
SFWMD-11	Rafter T Ranch	SFWMD	DWM	Operational	0.09	90
AP-1, AP-2, AP-3, SEB-1, SEB-2, HC-3, HC-5, HC-6, PC-1	Urban and Municipal BMPs	Avon Park, Sebring, Highlands County, Polk County	Public education, retention, wet detention, swales, alum injection, street sweeping	Started, Completed, Ongoing, Envisioned, Planned	0.25	253
SLID-1	Spring Lake Improvement District Improvements	Spring Lake Improvement District	Above-ground impoundment	Planned, Funded	0	5
N/A	100% BMP Implementation	FDACS	Implementation of BMPs on all agricultural lands without current NOIs	Started, Completed, Ongoing	1.46	1,459
N/A	Cost-Share BMP Implementation	FDACS	Implementation of cost-share BMPs	Started, Completed, Ongoing	0.05	47
TOTAL	**N/A**	**N/A**	**N/A**	**N/A**	**1.85**	**1,853**

TABLE ES-4: LOWER KISSIMMEE SUB-WATERSHED PROJECTS

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	TYPE	STATUS	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)
SFWMD-4	Otter Slough Restoration	SFWMD	Restoration	Completed	0.01	6
SFWMD-5	Kissimmee River Restoration	SFWMD	Restoration	Under Construction	17.75	17,748
SFWMD-13	Dixie West	SFWMD	DWM	Operational	0.23	231
SFWMD-14	Dixie Ranch	SFWMD	DWM	Operational	0.13	134
SFWMD-17	Willaway Cattle & Sod	SFWMD	DWM	Completed	0.11	114
SFWMD-19	Triple A Ranch	SFWMD	DWM	Under Construction	0.08	79
HC-4, OSC-11, PC-2	Urban and Municipal BMPs	Highlands County, Osceola County, Polk County	Public education/outreach	Ongoing	0.16	161
N/A	100% BMP Implementation	FDACS	Implementation of BMPs on all agricultural lands without current NOIs	Started, Completed, Ongoing	5.47	5,474
N/A	Cost-Share BMP Implementation	FDACS	Implementation of cost-share BMPs	Started, Completed, Ongoing	0.32	317
TOTAL	**N/A**	**N/A**	**N/A**	**N/A**	**24.26**	**24,263**

TABLE ES-5: TAYLOR CREEK/NUBBIN SLOUGH SUB-WATERSHED PROJECTS

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	TYPE	STATUS	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)
FDACS-1	Lemkin Creek	FDACS	Hybrid wetland treatment technologies (HWTT)	Operational	0.15	152
FDACS-2	Wolff Ditch	FDACS	HWTT	Operational	0.85	846
FDACS-3	Grassy Island	FDACS	HWTT	Completed	5.55	5,547
FDACS-5	Nubbin Slough	FDACS	HWTT	Completed	0.55	555
FDACS-6	Mosquito Creek	FDACS	HWTT	Completed	0.48	476
SFWMD-1	Taylor Creek	SFWMD	STA	Completed	1.8	1,803
SFWMD-2	Nubbin Slough	SFWMD	STA	Completed, Not Operational	6.19	6,194
SFWMD-3	Lakeside Ranch Phase I	SFWMD	STA	Completed	13.98	13,979
SFWMD-15	Dixie Ranch	SFWMD	DWM	Completed	0.21	206
FDOT1-1, FDOT1-2, FDOT1-3	Urban BMPs	Florida Department of Transportation (FDOT) District 1	Wet detention pond, street sweeping	Planned and Funded, Ongoing	0.1	101
OK-1, OK-2, OK-3, OK-4, OK-5	Urban and Municipal BMPs	Okeechobee County	Dry detention, continuous deflective separation (CDS) unit, baffle box	Unknown	0	6
N/A	100% BMP Implementation	FDACS	Implementation of BMPs on all agricultural lands without current NOIs	Started, Completed, Ongoing	5.86	5,858
N/A	Cost-Share BMP Implementation	FDACS	Implementation of cost-share BMPs	Started, Completed, Ongoing	0.64	642
TOTAL	**N/A**	**N/A**	**N/A**	**N/A**	**36.36**	**36,362**

TABLE ES-6: UPPER KISSIMMEE SUB-WATERSHED PROJECTS

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

N/A = Not applicable

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	TYPE	STATUS	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)
SFWMD-6	Phase I Rolling Meadows	SFWMD	Restoration	Planned, Funded	0.07	65
SFWMD-7	Gardner-Cobb Marsh	SFWMD	Restoration	Started	0.01	5
SFWMD-8	Rough Island	SFWMD	Restoration	Started	0.06	61
SFWMD-9	Oasis Marsh Restoration	SFWMD	Restoration	Started	0.2	195
SFWMD-16	Lost Oak Ranch	SFWMD	Restoration	Started	0.03	28
SFWMD-22	Kissimmee Headwaters Restoration	SFWMD	Restoration	Started	0.57	566
EW-1, KS-1, KS-2, KS-3, KS-4, KS-5, KS-6	Urban and Municipal BMPs	Edgewood, Kissimmee	Street sweeping, public education/outreach, dry detention, wet detention, baffle box	Started, Completed, Ongoing	0.11	110
ORL-1--ORL-17	Urban and Municipal BMPs	Orlando	Baffle boxes, catch basin inserts, public education, wet detention, septic tank phase out, street sweeping	Started, Completed, Ongoing, Planned	0.35	353
FDOT5-1--FDOT5-25	Urban BMPs	FDOT District 5	Street sweeping, public education/ outreach, dry detention, wet detention, dry retention, wet retention	Started, Completed, Ongoing, Planned	0.06	62
OC-1--OC-28, OSC-1--OSC-32, PC-3	Urban BMPs	Orange County, Osceola County, Polk County	Street sweeping, public education/ outreach, dry detention, wet detention, curb inlet basket, Stormceptor, retention, baffle box, alum injection, stormwater reuse, conservation area	Started, Completed, Ongoing, Planned, Envisioned	1.78	1,782
PC-4	Sumica Preserve Water Storage/Hydrologic Restoration	Polk County, SFWMD	DWM	Operational	0.01	7.5
N/A	100% BMP Implementation	FDACS	Implementation of BMPs on all agricultural lands without current NOIs	Started, Completed, Ongoing	3.45	3,452
N/A	Cost-Share BMP Implementation	FDACS	Implementation of cost-share BMPs	Started, Completed, Ongoing	0.03	25
TOTAL	**N/A**	**N/A**	**N/A**	**N/A**	**6.71**	**6,712**

TABLE ES-7: PROJECTS UNDER DEVELOPMENT WITH COORDINATING AGENCIES

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

N/A = Not applicable

PROJECT NAME	SUB-WATERSHED	STATUS	ESTIMATED TP REDUCTION (MT/YR)	ESTIMATED TP REDUCTION (KG/YR)	SCHEDULE
Istokpoga Marsh Watershed Improvement District-Phase II	Indian Prairie	Coordinating Agencies are waiting on design and engineering information from Phase I.	2	2,000	Work will begin in 2016.
Lakeside Ranch STA Phase II	Taylor Creek/ Nubbin Slough	Permit, funding, and construction are needed. It is expected that project could be fully operational within 6.5 to 9 years if funding were available.	7.6	7,600	Project is estimated to be completed by 2023.
MacArthur Agro-Ecology Research Center "Buck Island" Ranch/Rafter T Realty, Inc.	Lake Istokpoga Indian Prairie	Program implementation. SFWMD received $10 million for PES to continue program in 2015. These two projects are currently in contract negotiations.	0.945	945	Work will commence once contracts are in place.
Brighton Valley - Lykes	Indian Prairie	Land available. Expected design, engineering, and SFWMD permitting complete by 2015 if funded to move forward. Note: Reduction values provided by proposer. Needs further development.	7.7	7,700	Start construction 2016. Construction complete 2017.
Rolling Meadows Wetland Restoration - Phase II	Upper Kissimmee	Land acquired and planning started.	0.009	9	Work will be completed 6.5 to 9 years after commencement of planning activities.
Inactive Dairies- Lagoon Remediation	Taylor Creek/ Nubbin Slough and Indian Prairie	Develop program to remediate wastewater lagoons on inactive dairies. This is identified as potentially significant legacy load, and FDACS staff are working on identifying potential participants. Prioritization expected in early summer.	TBD	TBD	1. Identify areas for remediation activities/talk to landowners. (Winter 2014/2015-Summer 2015) 2. Procure contractors/conduct work. (Winter 2015/2016-Spring 2016) 3. Analyze data. (Yearly)
PL-566 Funded/ Fisheating Creek Structure	Fisheating Creek	Natural Resources Conservation Services (NRCS) and FDACS are working on this project with Highlands County.	0.88-2.65	883-2,648	1. NRCS plans to reapply for different funding. (Fall 2014) 2. If funding obtained, work will be conducted. (2015) 3. Water quality benefit calculations will be done. (Fall 2015)
S.R. 710 Regional Project	Taylor Creek/ Nubbin Slough and Indian Prairie	Feasibility study under way and expected to be complete in October 2014. Will likely require funding cooperation between Coordinating Agencies.	0.121-0.663	121-663	1. Final feasibility study due October 22, 2014. 2. Work will be implemented. (To be determined)
Legislative Cost-Share Appropriation Program ($10 million annually for seven years)	All	FDACS will identify cost-share projects and nutrient reductions.	26.56	26,560	1. Develop plan and present to the Department by winter 2014. 2. Implement projects by end of 2015. 3. Conduct same exercise annually.
TOTAL	**N/A**	**N/A**	**45.81-48.13**	**45,818-48,125**	**N/A**

TABLE ES-8: SUMMARY OF ESTIMATED REDUCTIONS

*The existing load is the long-term average as calculated with the WAM load estimation tool. This is calculated using information only for the six northern sub-watersheds, although the TMDL applies to all nine sub-watersheds. The existing load will be updated to include all sub-watersheds once the WAM updates are complete.
**The 105 MT/yr applies to all of the sub-watersheds and is not an allocation to any collection of sub-watersheds.
Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

CATEGORY	TP REDUCTION (MT/YR)
Existing Load*	448.3
Reductions Needed to Achieve TMDL (105 MT/yr)**	343.3
Total Reductions Achieved (Table ES-1 through Table ES-6)	100.00
Projects Under Development with Coordinating Agencies (Table ES-7)	45.81-48.13
Total Reductions (Table ES-1 through Table ES-7)	145.81-148.13 (42.5%-43.1%)
Total Reductions Remaining To Meet TMDL	195.17-197.49

TABLE ES-9: OTHER INITIATIVES

INITIATIVE	EXPLANATION	SCHEDULE	START DATE	COMPLETION DATE
Comprehensive Everglades Restoration Plan (CERP) Planning	SFWMD will consider reinitiating formulation of storage components of LOW project; however, this requires concurrence from U.S. Army Corps of Engineers (USACE) (Federal Partner).	1. Approach Federal Partner on initiation of reformulation of LOW project and to assess impacts on overall CERP Integrated Delivery Schedule (IDS) and CERP cost-share crediting. (Within two years of BMAP adoption). 2. If USACE is amenable and impacts to IDS and cost-share crediting are acceptable to partners, SFWMD will initiate reformulation. (Within five years of BMAP adoption). 3. Plan reformulation complete by 2024.	Fall 2016	Fall 2024
Owner-implemented BMP verification	FDACS and Department developing plan for BMP verification.	1. Identify key BMPs for each commodity type in basin. (Spring 2015) 2. Identify locations of BMPs in basin. (Fall 2015) 3. Develop monitoring plan/strategy. (Winter 2015/2016) 4. Identify willing owners. (Spring 2016) 5. Begin data collection. (Summer 2016) 6. Form committee to review findings. (Winter 2016/2017) 7. Data evaluation. (Annually)	Spring 2015	Winter 2016/2017
Cost-share BMP effectiveness verification	FDACS and Department developing approach to evaluate effectiveness of various types of cost-share projects.	1. Identify key cost-share projects. (Fall 2015) 2. Identify locations for effectiveness evaluation. (Winter 2015/2016) 3. Develop evaluation approach (monitoring/modeling/calculation). (Winter 2015/2016) 4. Implement cost-share projects. (Spring 2016) 5. Data evaluation. (Annually)	Fall 2015	Spring 2016

INITIATIVE	EXPLANATION	SCHEDULE	START DATE	COMPLETION DATE
WAM revisions	Coordinating Agencies developing contract to revise WAM to complete model domain setup for northern region and 3 southern sub-watersheds of LOW. Estimated completion date: a year after adoption of BMAP. Department will work to develop targets based on this information.	1. Develop scope of work for contract. (Fall 2014) 2. Execute contract. (Fall 2014) 3. Complete WAM efforts. (Winter 2015/2016) 4. Conduct sensitivity/uncertainty analyses and pre-drainage characterization. (Spring 2016) 5. Use WAM results to update sub-watershed existing loads and project nutrient reduction benefits in northern sub-watersheds and to develop existing loads in southern sub-watersheds and calculate project nutrient reduction benefits. (Fall 2016) 6. Identify elevated TP areas for additional project locations and prioritization. (Winter 2016/2017)	Fall 2014	Winter 2016/2017
Water quality monitoring	As Department develops monitoring plan for BMAP, consideration is being given to areas with on-the-ground projects/BMPs to evaluate water quality improvements.	1. Identify areas with regional projects already in place. (Complete) 2. Evaluate areas with needs for additional water quality data. (Once WAM complete.) 3. Identify lead entity for monitoring efforts. (Spring 2017-Summer 2017) 4. Finalize monitoring plan. (Upon BMAP adoption)	In Progress	Fall 2018
Alternative BMP nutrient reduction projects	North of Lake Okeechobee	1. Develop team to identify new possible strategies. (Winter 2014/2015) 2. Conduct team meetings. (Quarterly)	Winter 2014/2015	TBD
In-lake strategies muck scraping and tilling-	In Lake Okeechobee	Potential for inclusion as BMAP project if drought year occurs and permitting and bidding are completed in time for work to be conducted.	Fall 2014	2015 (Development of draft plan)

ANTICIPATED OUTCOMES OF BMAP IMPLEMENTATION

Through the implementation of projects, activities, and additional source assessment in this BMAP, stakeholders expect the following outcomes:

- Improvements in water quality trends in the LOW.
- Decreased loading of TP and TN. Although the TMDL is specific to TP, many of the management activities identified in the BMAP will also reduce TN loads to the lake.
- Decreased loading of TP and TN to the St. Lucie and Caloosahatchee Estuaries.
- Increased coordination between state and local governments and within divisions of local governments in problem solving for surface water quality restoration.
- Determination of effective projects through the stakeholder decision-making and priority-setting processes.
- Enhanced public awareness of stormwater runoff, pollutant sources, pollutant impacts on water quality, and corresponding corrective actions.
- Enhanced understanding of basin hydrology, water quality, pollutant sources, and legacy loads.

BMAP COST

Costs were provided for approximately 38% of the activities identified in **Table ES-1** through **Table ES-6**, with an estimated total cost of more than $937.7 million. Costs may include capital costs as well as those associated with construction and routine operations and maintenance and monitoring. It is important to note that many BMAP projects were built to achieve multiple objectives, and not just nutrient reductions; therefore, multiple objectives should be acknowledged when estimating a cost per pound of nutrient removal from these projects. One such example is the Kissimmee River Restoration project, which restores the ecological integrity of the Kissimmee River by providing flood control, wetland enhancement, and water quality improvements. The total anticipated cost for the project is $780 million. This project is well under way and has been funded in the amount of $660 million. Funds for some projects have already been spent, others have been obligated (Funded) to ongoing projects, and the remainder are yet to be appropriated (Unfunded). These costs are broken down in **Table ES-10,** based on the status shown for each project in **Tables A-3** through **A-8**. Projects in the "Spent" category include projects with a "Completed" status. The category designated as "Funded" includes projects that list a status

of designed, permitted, planned and funded, ongoing, started, or under construction. The "Unfunded" category includes projects with a status of "Envisioned, Not Funded," as well as estimated costs for projects from **Table A-9**.

TABLE ES-10: COSTS FOR SUBMITTED PROJECTS IN THE LAKE OKEECHOBEE BMAP

* These unfunded estimates do not include the costs for the Other Initiatives (**Table ES-9**) or costs for projects where estimates have not been generated, such as those that will be identified subsequent to CERP planning, which will be substantial.

PROJECTS	SPENT	FUNDED	UNFUNDED*
Cost	$55,832,175	$763,948,700	$247,419,124
Annual O&M Cost	$649,352	$6,867,473	$0

The funding sources for the projects range from local public and private contributions to state and federal legislative appropriations. The Department will continue to work with stakeholders to explore new opportunities for funding assistance to ensure that the activities listed in this BMAP can be maintained at the necessary level of effort and that additional projects can be constructed.

BMAP FOLLOW-UP

The Department will refine the load estimation tool to further understand the LOW and its biogeochemical dynamics, as well as work with the stakeholders to organize monitoring data, track project implementation, and develop new projects. The stakeholders will meet annually after BMAP adoption to follow up on plan implementation, share monitoring results, discuss study findings, and continue to coordinate on TMDL-related issues. More frequent meetings may be held on an as-needed basis.

COMMITMENT TO BMAP IMPLEMENTATION

The responsible parties have committed to implementing the projects and activities included in this BMAP. These projects are identified in the **Executive Summary, Chapter 5,** and **Appendix A** of this BMAP. The Department will continue to work with stakeholders to identify and secure funding for projects identified in this BMAP. See **Appendix D** for potential funding sources.

Chapter 1: CONTEXT, PURPOSE, AND SCOPE OF THE PLAN

Lake Okeechobee is a large, shallow eutrophic lake located in subtropical south central Florida. The Lake Okeechobee Watershed (LOW) primarily covers Glades, Hendry, Highlands, Martin, Okeechobee, Orange, Osceola, Palm Beach, and Polk Counties. Lake Okeechobee is a major component of the United States Army Corps of Engineers (USACE) regional flood control project, and it provides water supply to the Okeechobee Utility Authority, as well as backup water supply for many south Florida residents. Lake Okeechobee releases also influence salinity in the Caloosahatchee and St. Lucie Estuaries. It supports multimillion-dollar sport and commercial fisheries and recreational opportunities. Lake Okeechobee also provides habitat for various wildlife species, such as the Everglades snail kite, migratory waterfowl, alligators, and wading birds (South Florida Water Management District [SFWMD] *et al.* 2014).

Lake Okeechobee and its watershed have been subjected to anthropogenic, hydrologic, and land use modifications over the past century that have led to a degradation of its water quality. To help address the nutrient impairment, the Florida Department of Environmental Protection adopted a Total Maximum Daily Load to identify the target load for total phosphorus (TP) discharges to the lake.

This Basin Management Action Plan represents the joint efforts of multiple stakeholders to identify and implement projects that ultimately achieve the TP TMDL for Lake Okeechobee. Pursuant to Subparagraph 403.067(7)(a)1, Florida Statutes (F.S.), this BMAP is a phased approach and integrates other existing water quality protection plans such as the Northern Everglades and Estuaries Protection Program (NEEPP). The BMAP includes projects to reduce watershed nutrient loading and a monitoring plan to measure progress in implementing long-term restoration efforts.

Stakeholder involvement is critical to the ultimate success of a BMAP. The Department invited all interested stakeholders to participate in the Lake Okeechobee BMAP development and facilitated participation to ensure that all voices were heard and opinions considered. This approach resulted in the use of a phased implementation process. Ultimately, the BMAP will be implemented in phases to achieve the TMDL.

This chapter describes the TMDL Program, stakeholder involvement in BMAP development, BMAP purpose and scope, BMAP approach, TMDLs addressed, assumptions and considerations identified during BMAP development, and future growth in the basin.

1.1 WATER QUALITY STANDARDS AND TMDLS

Florida's water quality standards are designed to ensure that surface waters can be used for their designated purposes, such as drinking water, recreation, and agriculture. Lake Okeechobee is designated as a Class I water, with uses including public water supply, recreation, and propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Most surface waters in Florida, including those in the LOW which ultimately reach Lake Okeechobee, are categorized as Class III waters. **Table 1** shows all designated use categories.

TABLE 1: DESIGNATED USE ATTAINMENT CATEGORIES FOR FLORIDA SURFACE WATERS

* Surface water classification for Lake Okeechobee.
** Surface water classification for waters in the LOW.

CATEGORY	DESCRIPTION
Class I*	**Potable water supplies**
Class II	Shellfish propagation or harvesting
Class III**	**Recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife**
Class III-Limited	Fish consumption, recreation or limited recreation, and/or propagation and maintenance of a limited population of fish and wildlife
Class IV	Agricultural water supplies
Class V	Navigation, utility, and industrial use (*no current Class V designations*)

Under Section 303(d) of the federal Clean Water Act, every two years each state identifies its "impaired" waters, including estuaries, lakes, rivers, and streams, that do not meet their designated uses and are not expected to improve within the subsequent two years. The Department is responsible for developing this "303(d) list" of Florida impaired waters.

In Florida, impairments most often are the result of nonattainment of the state's criteria for nutrients, dissolved oxygen, or fecal coliform bacteria. The Department develops and adopts TMDLs for waterbody segments verified as impaired and for which a causative pollutant has been identified. A TMDL is the maximum amount of a specific pollutant that a waterbody can assimilate while maintaining its designated uses.

TMDLs are developed, allocated, and implemented through a watershed management approach that addresses the state's 52 major hydrologic basins in five groups on a rotating schedule. **Table 2** shows the hydrologic basins within each of the five groups, and the Department's District office of jurisdiction. Lake Okeechobee is a Group I Basin.

TABLE 2: MAJOR HYDROLOGIC BASINS BY GROUP AND DEPARTMENT DISTRICT OFFICE

DEPARTMENT DISTRICT	GROUP 1 BASINS	GROUP 2 BASINS	GROUP 3 BASINS	GROUP 4 BASINS	GROUP 5 BASINS
NW	Ochlockonee–St. Marks	Apalachicola–Chipola	Choctawhatchee–St. Andrews Bay	Pensacola Bay	Perdido Bay
NE	Suwannee	Lower St. Johns	Not applicable	Nassau–St. Marys	Upper East Coast
Central	Ocklawaha	Middle St. Johns	Upper St. Johns	Kissimmee	Indian River Lagoon
SW	Tampa Bay	Tampa Bay Tributaries	Sarasota Bay–Peace–Myakka	Withlacoochee	Springs Coast
S	Everglades West Coast	Charlotte Harbor	Caloosahatchee	Fisheating Creek	Florida Keys
SE	Lake Okeechobee	St. Lucie–Loxahatchee	Lake Worth Lagoon–Palm Beach Coast	Southeast Coast–Biscayne Bay	Everglades

Each group will undergo a cycle of five phases on a rotating schedule:

Phase 1: Preliminary evaluation of water quality.

Phase 2: Strategic monitoring and assessment to verify water quality impairments.

Phase 3: Development and adoption of TMDLs for waters verified as impaired.

Phase 4: Development of BMAP to achieve the TMDL.

Phase 5: Implementation of the BMAP and monitoring of results.

The water quality evaluation and decision-making processes for listing impaired waters and establishing TMDLs are authorized by Section 403.067, F.S., known as the Florida Watershed Restoration Act (FWRA), and contained in Florida's Identification of Impaired Surface Waters Rule (Chapter 62-303, Florida Administrative Code [F.A.C.]).

1.2 TMDL IMPLEMENTATION

Rule-adopted TMDLs may be implemented through BMAPs, which contain strategies to reduce and prevent pollutant discharges into impaired waterbodies through various cost-effective means. The Department develops BMAPs (a basin may have more than one BMAP) or other implementation approaches to address TMDLs based on practical considerations. The Department will work with the stakeholders within multiple basins to coordinate the provisions of the FWRA that guide the development of BMAPs and other TMDL implementation approaches.

Stakeholder involvement is critical to the success of the TMDL Program. The BMAP development process is structured to build cooperation and consensus among a broad range of interested parties. The Department invites stakeholders to participate in the BMAP development process and encourages public

participation to the greatest practicable extent. Stakeholder involvement is essential to develop, gain support for, and secure commitments to implement the BMAP.

1.3 LAKE OKEECHOBEE BMAP

For more than four decades, restoration efforts have been under way to improve the LOW through implementation of a suite of best management practices (BMPs), projects, and programs. Early water quality restoration efforts, such as the Rural Clean Waters Program, the Taylor Creek Headwaters Program, the dairy buyout, and the Department's dairy technology-based rule have resulted in phosphorus load reductions but not to the desired levels.

In 1989, the Lake Okeechobee Surface Water Improvement and Management (SWIM) Plan (SFWMD 1989) was developed in accordance with the 1987 SWIM Act, which focused on water quality improvement. The SWIM Act (Sections 373.451–.459, F.S.), adopted by the Florida Legislature in 1987, required the water management districts, in conjunction with other state agencies and local governments, to prepare SWIM Plans for priority waterbodies, including Lake Okeechobee. The Lake Okeechobee SWIM Plan described strategies and potential programs for restoring or protecting the waterbody for recreation, propagation and maintenance of a healthy, well-balanced population of fish and wildlife. Even with the implementation of these programs and projects, nutrient loads to Lake Okeechobee did not decrease enough to achieve the TMDL.

In response and in order to provide further protections, the 2000 Florida Legislature passed the Lake Okeechobee Protection Act (LOPA), which requires the Coordinating Agencies—SFWMD, Florida Department of Agriculture and Consumer Services (FDACS), and Department—to work together to address TP loading and exotic species control. The LOPA was amended in 2007 to expand restoration efforts to include the St. Lucie and Caloosahatchee River Watersheds and to also focus on hydrology, and is now called the Northern Everglades and Estuaries Protection Program (NEEPP) (Section 373.4595, F.S.). The Lake Okeechobee Watershed Protection Plan (LOWPP), required under NEEPP, is a cooperative effort between the Coordinating Agencies that promotes a comprehensive, interconnected watershed approach to protecting the lake and its downstream estuaries, Caloosahatchee and St. Lucie.

The Coordinating Agencies developed the LOWPP, which is reevaluated every three years pursuant to NEEPP. As required by NEEPP, the Lake Okeechobee Protection Plan (LOPP) was originally submitted to the Florida Legislature on January 1, 2004 (SFWMD *et al.* 2004), the Lake Okeechobee Watershed Construction Project Phase II Technical Plan (LOWCP-P2TP) in February 2008 (SFWMD *et al.* 2008),

and three-year LOWPP Updates in 2007, 2011, and 2014 (SFWMD *et al.* 2007; SFWMD *et al.* 2011; SFWMD *et al.* 2014). NEEPP states that the LOWCP-P2TP should provide the basis for the Lake Okeechobee BMAP. As a result, the SFWMD and the Department collaborated on the LOWCP-P2TP efforts, and the Department ensured consistency between the two plans. The Coordinating Agencies will continue to work closely to align the BMAP and LOWCP-P2TP information in future iterations of the BMAP and the LOWCP-P2TP Updates.

1.3.1 STAKEHOLDER INVOLVEMENT

The BMAP process engages local stakeholders and promotes coordination and collaboration to address the reductions for TP. In February 2013, the Department initiated the BMAP development process and held a series of technical meetings involving stakeholders and the general public. These technical meetings were held to gather information; identify potential sources; conduct field reconnaissance; define programs, projects, and actions currently under way; and develop the BMAP projects that will reduce TP loads to Lake Okeechobee with the ultimate goal of achieving the TMDL target. Technical meetings were held throughout the BMAP development process on the following dates:

- February 20, 2013.
- April 16, 2013
- June 11, 2013.
- August 6, 2013.
- November 15, 2013.
- January 22, 2014.
- February 19, 2014.
- March 19, 2014.
- April 16, 2014.
- September 17, 2014.

All technical meetings were open to the public and noticed in the *Florida Administrative Register*. Public comment was invited during each public meeting, and technical meetings were open to anyone interested in participating in the technical discussions. In addition, a public meeting about the BMAP was held on November 18, 2014.

Except as specifically noted in subsequent sections, this BMAP document reflects stakeholder input along with public input from workshops and meetings held to discuss key aspects of the TMDL and BMAP development.

1.3.2 PLAN PURPOSE AND SCOPE

Ultimately, the purpose of this BMAP is to implement TP load reductions to achieve the TMDL for Lake Okeechobee. This plan requires specific projects that have provided or will provide load reductions and a schedule for implementation during the first iteration of the BMAP. The BMAP also details a monitoring network that will be used by the Department to measure progress towards achieving predicted load reductions. The stakeholders will meet at least annually to review progress made towards achieving the TMDL.

In 2001, the Department adopted a TP TMDL for Lake Okeechobee. Lake Okeechobee includes nine segments with waterbody identification (WBID) numbers: 3212A, 3212B, 3212C, 3212D, 3212E, 3212F, 3212G, 3212H, and 3212I. The BMAP encompasses these WBIDs as well as the nine sub-watersheds that contribute to Lake Okeechobee.

Lake Okeechobee and its associated watershed are located in subtropical south central Florida in Glades, Hendry, Highlands, Martin, Okeechobee, Orange, Osceola, Palm Beach, and Polk Counties(see **Figure 1**). The LOW is divided into nine sub-watersheds, as follows:

- Upper Kissimmee.*
- Lower Kissimmee.*
- Taylor Creek/Nubbin Slough.*
- Lake Istokpoga.*
- Indian Prairie.*
- Fisheating Creek.*
- East Lake Okeechobee.
- West Lake Okeechobee.
- South Lake Okeechobee.

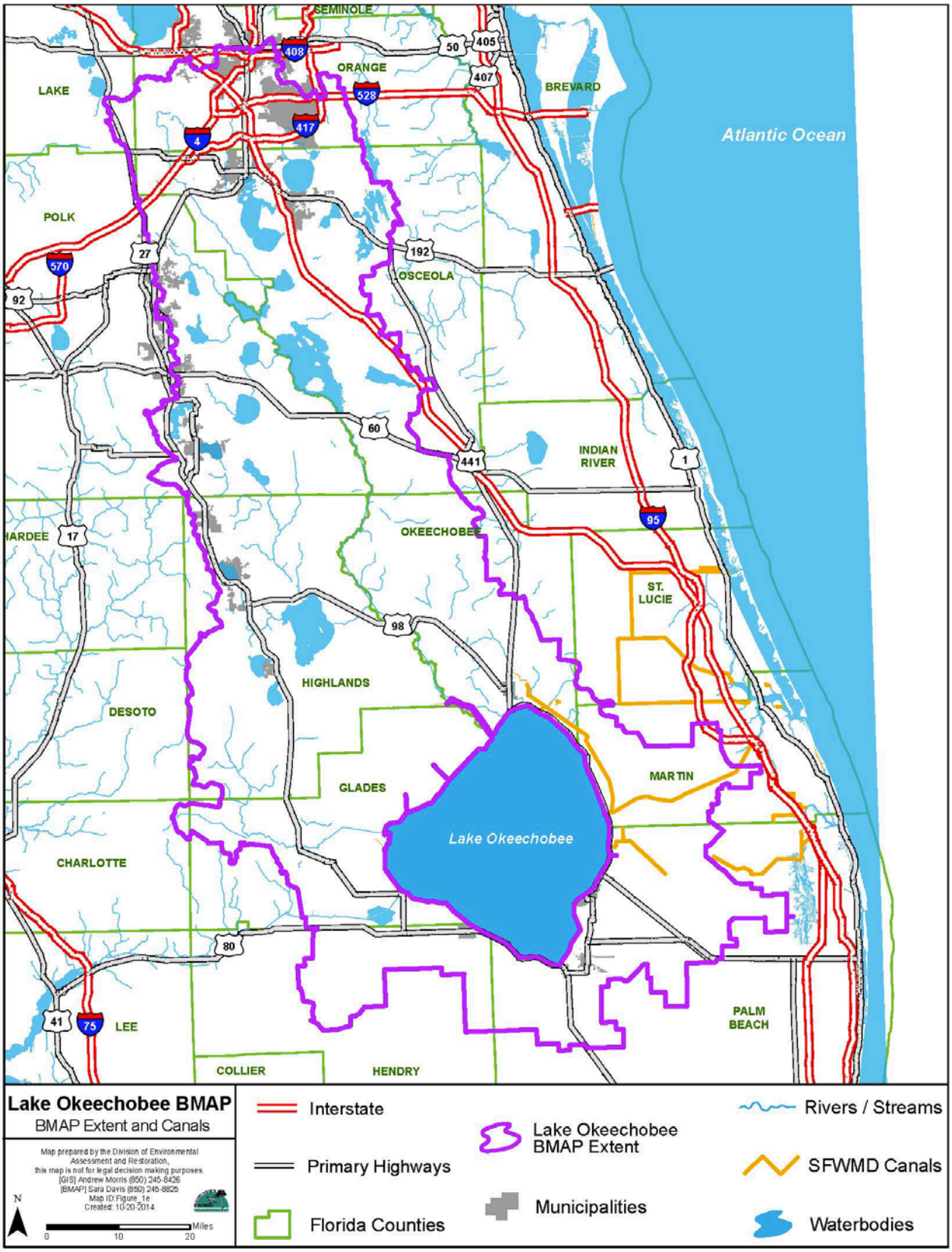

FIGURE 1: LAKE OKEECHOBEE WATERSHED

Figure 2 shows the nine sub-watersheds that are part of the LOW. This BMAP will be implemented through a phased approach. Although the BMAP encompasses the entire LOW, for this first BMAP phase, the Department is focusing on project implementation in the six sub-watersheds north of Lake Okeechobee. For calendar years (CY) 2001–12, these northern sub-watersheds contributed approximately 89.1% of the TP load and 88.3% of the discharge to Lake Okeechobee (SFWMD *et al.* 2014). Each of these focus sub-watersheds is indicated by an asterisk in the list above.

The three southern sub-watersheds contribute a comparatively smaller percentage of overall loadings to Lake Okeechobee, and flow from these sub-watersheds into the lake is largely diverted in directions other than towards the lake. The three southern sub-watersheds have other existing regulatory programs, including SFWMD's Chapter 40E-63, Florida Administrative Code (F.A.C.) and/or FDACS Best Management Practices (BMP) Program. The three southern sub-watersheds are included in this BMAP, and the projects listed in **Section 5.11** will continue under this BMAP. However, these sub-watersheds will be further evaluated in future phases of BMAP implementation consistent with Subparagraph 403.067(7)(a)1, F.S.

These nine sub-watersheds can be further subdivided into basins (SFWMD *et al.* 2014): Upper Kissimmee—above structure S-65; Lower Kissimmee—between structures S-65E and S-65; Taylor Creek/Nubbin Slough-S-191, S-13, S-135, S-154, and S-154C basins; Lake Istokpoga—above structure S-68; Indian Prairie-C-40, C-41 AN, C-41 AS, C-41N, C-41S, L-48, L-49, L-59E, L-59W, L-60E, L-60W, L-61E, and S-131 basins; Fisheating Creek—Fisheating Creek, L-61W, and Nicodemus Slough North basins; East Lake Okeechobee—Basin 8, C-44, S-153, and L-8 basins; West Lake Okeechobee—East Caloosahatchee, Hicpochee North, and Nicodemus Slough South; and South Lake Okeechobee—S-4 basin and most basins in the Everglades Agricultural Area (EAA) and Chapter 298 districts. Detailed maps for the sub-watersheds are provided in **Appendix C**.

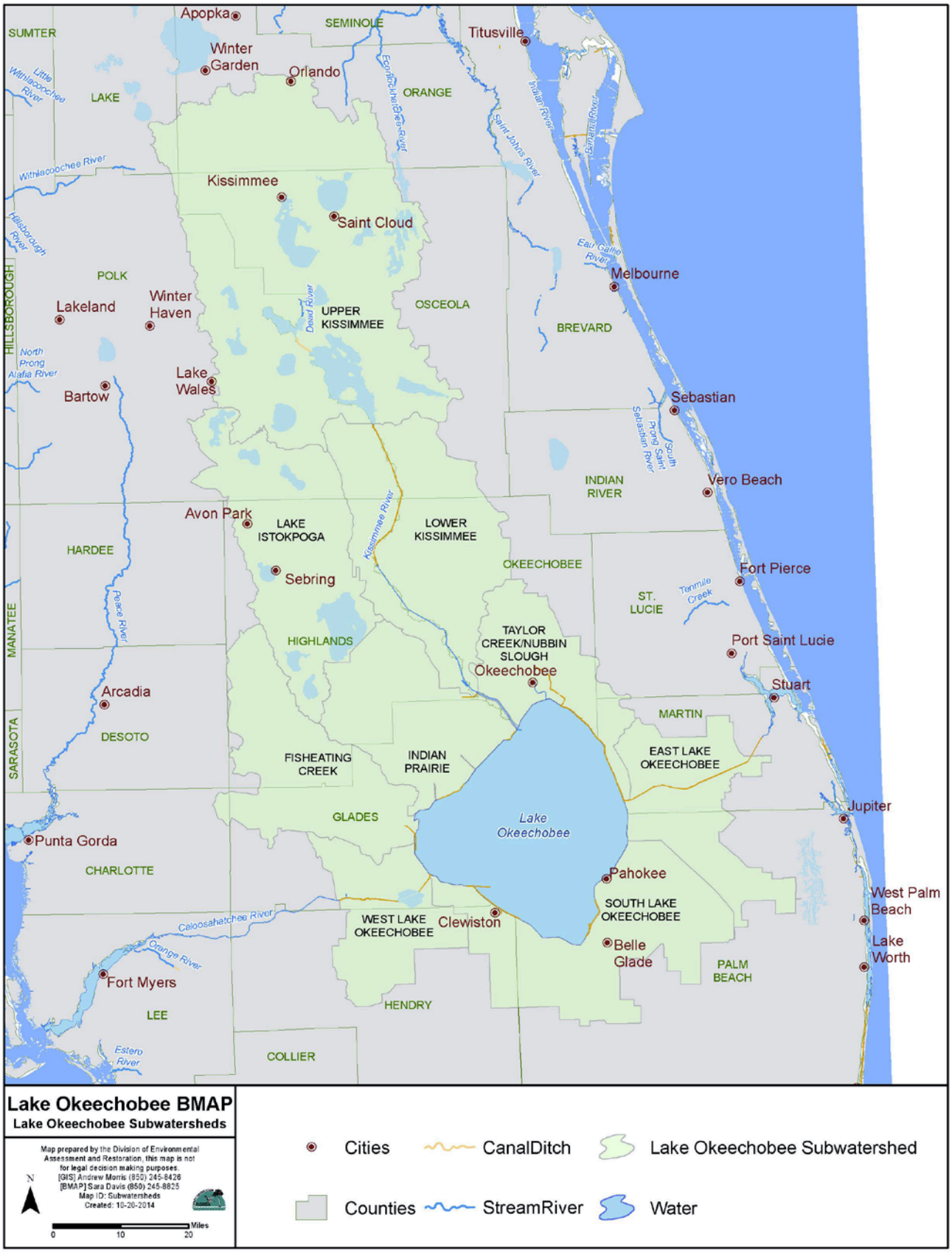

FIGURE 2: LAKE OKEECHOBEE SUB-WATERSHEDS

1.3.3 BMAP APPROACH

The BMAP provides for phased implementation under Subparagraph 403.067(7)(a)1, F.S. The management actions and adaptive management approach described in the BMAP will address TP reductions, and the process will continue until the TMDL is attained. The phased BMAP approach allows for the implementation of projects designed to achieve incremental reductions, while simultaneously monitoring and conducting studies to better understand the water quality dynamics (sources and response variables) in the watershed.

The Department requested that the stakeholders provide information on activities and projects that would reduce nutrient loading. The outputs from the Watershed Assessment Model (WAM) were used to develop a load estimation tool for the calculation of existing loads and nutrient reduction benefits associated with stakeholder projects. For this first BMAP phase, the management strategy reductions are spread over approximately a ten-year time frame in order for the Coordinating Agencies to develop additional projects to meet the TMDL. This BMAP includes projects in the six northern sub-watersheds that will achieve a reduction of approximately 145.8 to 148.1 MT of reduction in TP. Of this, 100.0 MT will be achieved through projects associated with **Tables ES-1** through **ES-6**, and the remaining reductions of 45.81 to 48.13 MT are associated with projects still under development that will be completed in accordance with the design schedule. Dates for completion will be updated as projects are developed by the Coordinating Agencies.

Additional reductions will be included in future BMAP updates to help meet the TMDL, and the Department will work with the stakeholders to identify new projects. The Coordinating Agencies are currently working on additional projects that will also achieve nutrient reductions. Projects that have been completed since 2009 or are expected to be completed within ten years are acknowledged in the load reduction calculations and were assigned nutrient reduction benefits. The Department will periodically assess progress toward attainment of the milestones in this BMAP, and adjustments will be made as needed to meet the milestones. Updates to the BMAP will be conducted during the ten-year time frame as necessary and appropriate. Specifically, the BMAP will be updated no later than three years following the WAM model updates to include any necessary additional projects or reductions. Projects that will be implemented under this first phase of the BMAP are listed in **Appendix A**.

1.3.4 POLLUTANT REDUCTION AND DISCHARGE ALLOCATIONS

Reasonable and equitable allocations must be established that will alone, or in conjunction with other management and restoration activities, attain the TMDL. Allocations of the pollutant may be to individual

sources, source categories, basins that discharge to the impaired waterbody, or the watershed as a whole in accordance with Subsection 403.067(a)2, F.S. For this BMAP, the TMDL was allocated to the watershed as a whole.

TMDLs are defined as follows:

TMDL = Wasteload Allocation + Load Allocation + Margin of Safety

These categories are described as follows:

- Wasteload Allocation is the allocation to point sources permitted under the National Pollutant Discharge Elimination System (NPDES) Program. It includes the following:
  - NPDES Wastewater Allocation is the discharge allocation to NPDES-permitted industrial and domestic wastewater facilities. The Lake Okeechobee TMDL did not include any such wasteload allocations.
  - NPDES Stormwater Allocation is the allocation to NPDES stormwater permittees that operate municipal separate storm sewer systems (MS4s). These permittees are treated as point sources under the TMDL Program.
  - The Lake Okeechobee TMDL did not include a wasteload allocation as no point sources that discharged directly to the lake existed in the watershed at the time of TMDL development.
- Load Allocation is the allocation to nonpoint sources, including agricultural runoff and stormwater from areas that are not included in an MS4 permit. This includes the TP load from atmospheric deposition, which was estimated to be 35 MT/yr.
- A Margin of Safety (MOS) is required as part of a TMDL in recognition that there are many uncertainties in scientific and technical understanding of the chemical and biological processes that occur in Lake Okeechobee. The MOS is intended to account for uncertainties in a conservative manner that protects the environment. In the Lake Okeechobee TMDL, the MOS is accounted for by using conservative estimates in the derivation of the TMDL.

1.3.5 LAKE OKEECHOBEE TMDL

The Department adopted the TP TMDL for Lake Okeechobee in May 2001. The TMDL is a total annual phosphorus load to Lake Okeechobee of 140 MT, computed as a five-year rolling average. The TMDL includes the nine sub-watersheds that contribute to the lake.

1.4 ASSUMPTIONS AND CONSIDERATIONS REGARDING TMDL IMPLEMENTATION

The water quality impacts of BMAP implementation are based on several fundamental assumptions about the pollutants targeted by the TMDLs, modeling approaches, waterbody response, and natural processes. In addition, there are important considerations about the nature of the BMAP and its long-term implementation. These assumptions and considerations are discussed below.

1.4.1 ASSUMPTIONS

The following assumptions were used during the BMAP process:

- For CY2001–12, the six northern sub-watersheds contributed approximately 89.1% of the TP load and 88.3% of the discharge to Lake Okeechobee (SFWMD 2014); therefore, the Department has chosen to focus on these sub-watersheds during this initial BMAP iteration.
- Certain BMPs were assigned provisional nutrient reduction benefits for load reductions in this BMAP iteration while additional research is conducted to quantify their effectiveness. These estimated reductions may change in future BMAP iterations, as additional research results become available.
- Nutrient reduction benefits (shown in **Appendix A**) of the stakeholders' projects were calculated using the best available methodologies. Project-specific monitoring, where available, will be used to verify the Department's calculations, and reduction benefits may be adjusted as necessary.

1.4.2 CONSIDERATIONS

This BMAP requires stakeholders to implement their projects to achieve reductions within the specified period. However, the full implementation of this BMAP will be a long-term, adaptively managed process. While some of the projects and activities contained in the BMAP were recently completed or are currently ongoing, several projects require more time to design, secure funding, and construct.

Since BMAP implementation is a long-term process, the TMDL established for this basin is not likely to be achieved in the first ten-year iteration. It is understood that waterbodies may respond differently to the

implementation of BMPs, and so regular follow-up and continued coordination and communication by the stakeholders will be essential to ensure the implementation of management strategies and assessment of incremental effects.

During the BMAP process, several items were identified that should be addressed in future watershed management cycles to ensure that future BMAPs use the most accurate information:

- **Land Uses** – The loading estimates in the BMAP are based on land uses at a particular point in time, allowing the model to be validated and calibrated. The loading estimates for this BMAP iteration were based on 2009 land use data that were updated by the SFWMD during 2013. This dataset is referred to in this document as the 2009 land use. In future BMAP updates, the most current land use coverage should be used. The WAM updates in this BMAP will allow for the differentiation of phosphorus loading from various land use types, including natural lands in the watershed.
- **Watershed Boundaries** – The Department used the watershed boundaries that were developed by the SFWMD during the 2014 LOPP Update process. However, during BMAP development, the city of Orlando and the city of Lake Wales informed the Department that certain portions of their cities are included in the watershed erroneously. In addition, Osceola County has informed the Department of the need for further evaluation of the contribution to the loading from certain lakes in the county. For the next BMAP update, the Department and SFWMD will evaluate whether these particular areas should be included in future Lake Okeechobee BMAP boundaries.
- **WAM/Load Estimation Tool** – The Department used the output from the WAM to develop its load estimation tool. This tool was then used to calculate existing loads and nutrient reduction benefits associated with the projects. WAM uses land use and soil data to calculate average nutrient loads for land uses. The Department recognizes that additional work will need to be done to verify these estimates.
- **Complexity of Problem** – The Department acknowledges the complexity of the dynamics that affect the water quality of Lake Okeechobee and its watershed (*e.g.*, in-lake processes as well as hurricanes and other extreme weather events); therefore, this BMAP to restore the lake is designed to encompass a wide variety of projects that

will have a cumulative impact. However, the Department realizes that new project ideas and technologies are necessary to achieve the TMDL. Further investigation, in cooperation with the stakeholders, will be done to identify and assess these needs as well as potential solutions.

— **Legacy Phosphorus** – The Department recognizes that legacy phosphorus is present in the LOW as a result of past anthropogenic activities, and this load has the potential to be transported to Lake Okeechobee. Approximately 65% of TP in the LOW's soils is reactive and available for release. If 10% to 25% of this reactive phosphorus is available at any given time, the current amount of legacy phosphorus, in combination with the reactive phosphorus, in the system could be as high as 500 MT/yr to Lake Okeechobee for the next 20 to 50 years (SFWMD 2014; Reddy *et al.* 2011). Through the BMAP process, the Department will work to identify projects and management strategies that will address this legacy load (Soil and Water Engineering Technology [SWET] 2008).

— **Downstream Attenuation Factors** – The Lower Kissimmee, Indian Prairie, Fisheating Creek, and Taylor Creek/Nubbin Slough Sub-watersheds discharge directly to Lake Okeechobee without going through any major downstream rivers or stream segments. The Upper Kissimmee and Lake Istokpoga Sub-watersheds go through the Lower Kissimmee and Indian Prairie Sub-watersheds, respectively, before discharging to Lake Okeechobee. Therefore, the load from these sub-watersheds goes through attenuation within the sub-watershed and downstream sub-watersheds before reaching Lake Okeechobee. Downstream attenuation is not calculated in the load estimation tool at this time; however, as part of the WAM refinements, the Department will work with the stakeholders to determine the most appropriate downstream attenuation factors to include in the model for these two sub-watersheds.

— **Attenuation Factors** – Attenuation factors in the Upper Kissimmee and Lake Istokpoga Sub-watersheds are relatively high due to the number of lakes in these sub-watersheds. The TP attenuation factor for the Upper Kissimmee Sub-watershed is 78.3% and 75.1% for Lake Istokpoga Sub-watershed. Attenuation factors for each of the 11 WAM domains that cover the six northern sub-watersheds are further discussed in Chapter 4. These factors were applied to the projects in the calculation

process to determine the nutrient reduction benefits to Lake Okeechobee. Several stakeholders suggested that attenuation factors should be project specific, where possible. Refinements to these factors, where possible, will be made and incorporated into future BMAP updates based on model refinements and project-specific data.

— **Elevated TP Identification** – The load estimation tool was used to identify areas with high TP loading in each of the six northern sub-watersheds. As the WAM is refined, the Department will mesh current land use, existing literature and figures, and on-the-ground knowledge of current activities with modeled TP loads to determine ideal project placement for future efforts.

— **Upstream TMDLs and Kissimmee Chain of Lakes TMDLs** – The nutrient TMDLs for Lake Kissimmee (WBID 3183B), Lake Cypress (WBID 3180A), Lake Holden (WBID 3168H), Lake Jackson (WBID 3183G), and Lake Marian (WBID 3184) became effective on December 17, 2013. The Department will develop an implementation plan for these areas and will work to ensure that this plan is consistent with the BMAP.

— **Total Nitrogen (TN)** – Although the Lake Okeechobee TMDL only addresses TP, TN is of particular importance to the Caloosahatchee and St. Lucie Estuaries, which receive flows directly from Lake Okeechobee. Each of these estuaries has a TMDL and a BMAP in place to address TN; therefore, the Department has calculated project reduction benefits for TN to track TN management efforts in the LOW that will directly or indirectly benefit downstream waters. To date, the projects submitted by the stakeholders, in which TN reductions could be quantified, will achieve an estimated 123.1 MT reduction in TN. The existing TN load as calculated by the load estimation tool is 6,375 MT. Based on the data currently available to the Department, the TN annual geometric means do not exceed the Numeric Nutrient Criteria (NNC) values for the Lake Okeechobee WBIDs. However, if the lake is found to be impaired in the future, the Department will develop a TMDL for TN in accordance with Section 403.067, F.S., and TN reductions will be addressed in future iterations of this BMAP.

— **Previous Restoration Efforts** – The Department recognizes that stakeholders throughout the watershed have implemented stormwater management projects as well

as statutorily mandated diversions away from Lake Okeechobee prior to 2009 and that these efforts have benefitted water quality. However, the BMAP focuses on efforts completed, planned, or ongoing since 2009.

1.5 FUTURE GROWTH IN THE WATERSHED

The FWRA (Subparagraph 403.067[7][a]2, F.S.) requires that BMAPs "identify the mechanisms by which potential future increases in pollutant loading will be addressed." Subsection 373.414(1), F.S., requires that Environmental Resource Permit (ERP) applicants provide reasonable assurance that state water quality standards will not be violated by their proposed activity. For those water quality parameters not meeting standards prior to the proposed activity, the permit applicant must include measures that result in a net improvement of the water quality in the receiving body of water. Lake Okeechobee and its watershed include impaired waters that do not currently meet state water quality standards; therefore, new development in the basin cannot increase nutrient loads to these waters.

Chapter 2: LAKE OKEECHOBEE WATERSHED SETTING

2.1 LAND USE COVERAGE

Land use categories for the nine sub-watersheds that comprise the LOW were aggregated using the simplified Level 1 codes, which are shown in **Table 3** and **Figure 3**.

TABLE 3: 2009 LAND USES IN THE LAKE OKEECHOBEE WATERSHED

- = Empty cell/no data

LEVEL 1 LAND USE CODE	LAND USE	ACRES	% TOTAL
1000	Urban and Built-Up	353,825.14	9.08%
2000	Agriculture	1,732,488.31	44.45%
3000	Upland Nonforested	206,351.87	5.29%
4000	Upland Forests	251,385.08	6.45%
5000	Water	574,717.97	14.74%
6000	Wetlands	702,776.55	18.03%
7000	Barren Land	24,118.56	0.62%
8000	Transportation, Communication, and Utilities	39,114.52	1.00%
9000	Inactive Dairy	13,076.81	0.34%
-	**Total**	**3,897,854.81**	**100%**

The largest land use in the watershed is agriculture, which makes up 44.45% of the area. The remaining anthropogenic land uses include urban and built-up (9.08% of the basin); barren land (0.62%); and transportation, communication, and utilities (1.00%). The remaining 44.85% of the basin is made up of largely natural land uses. Level 2 land use categories for the LOW were aggregated, and these results are shown in **Appendix B**.

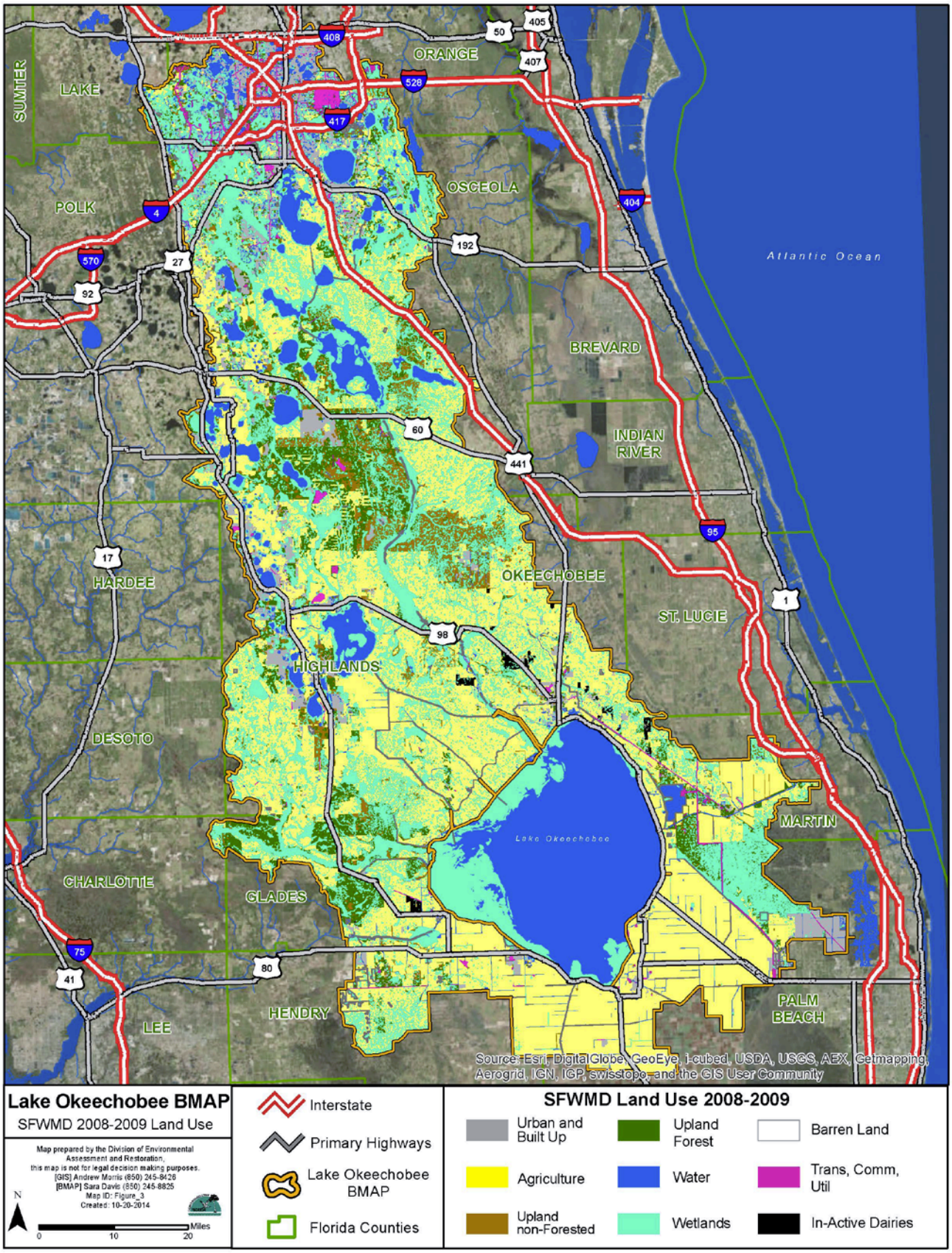

FIGURE 3: 2009 LAND USES IN THE LAKE OKEECHOBEE WATERSHED

2.2 HYDROLOGY AND TOPOGRAPHY

Lake Okeechobee's drainage basin covers more than 4,600 square miles (Department 2001). The LOW boundary was originally defined under the SWIM Program as those basins that are direct tributaries to the lake, including upstream tributaries and/or basins from which water is regularly released or pumped into the lake (Department 2001). The boundary was further refined by the LOPA and the NEEPP. Based on discharge data from 2001–12, the Upper Kissimmee Sub-watershed contributes the highest discharge of 826,015 acre-feet (ac-ft) per year, or 35.0% of the total discharges to Lake Okeechobee from its watershed (2,363,336 ac-ft). The West Lake Okeechobee Sub-watershed contributes the lowest discharges to Lake Okeechobee, with a discharge rate of 57,611 ac-ft, or 2.4% of the total flows to the lake. **Table 4** shows the measured discharges as calculated by the SFWMD from each of the sub-watersheds to Lake Okeechobee for CY2001–12 and for water year (WY) 2013. The two different periods illustrate the variance in discharges from the sub-watersheds. During WY2013, the largest surface water inflows came from the Upper Kissimmee Sub-watershed, followed by the Lower Kissimmee and Indian Prairie Sub-watersheds (SFWMD *et al.* 2014). Together, these three sub-watersheds contributed 54% of the total flow to Lake Okeechobee.

TABLE 4: DISCHARGES TO LAKE OKEECHOBEE FOR CALENDAR YEARS 2001–12 AND WY 2013

SUB-WATERSHED	2001–12 DISCHARGE (AC-FT)	PERCENT (%)	2013 DISCHARGE (AC-FT)	PERCENT (%)
East Lake Okeechobee	124,121	5.3%	197,686	9.2%
Fisheating Creek	243,180	10.3%	204,560	9.5%
Indian Prairie	263,475	11.1%	299,311	13.9%
Lake Istokpoga	273,600	11.6%	280,540	13.0%
Lower Kissimmee	335,527	14.2%	423,814	19.7%
South Lake Okeechobee	96,297	4.1%	93,047	4.3%
Taylor Creek/ Nubbin Slough	143,780	6.1%	208,380	9.7%
Upper Kissimmee	826,015	35.0%	439,646	20.4%
West Lake Okeechobee	57,611	2.4%	5,070	0.2%
Total	**2,363,336**	**100.0%**	**2,152,054**	**100.0%**

Wind patterns in direction and velocity affect both water movement and currents in Lake Okeechobee. These patterns create gyres or distinct circulation patterns. The residence time (not including evapotranspiration) of water in Lake Okeechobee is approximately three years (SFWMD 1997; Department 2001). However, the residence time varies with rainfall, storage in the lake, and outflows. The LOW receives an average of 53 inches of rainfall each year. Approximately 75% of rainfall in the LOW comes during the summer convective storms (Purdam *et al.* 1998; Department 2001).

The hydrology of the LOW drainage system has been modified by extensive ditching and diking to create farmland, control flooding, provide navigation, and facilitate greater water storage capacity in Lake Okeechobee (SFWMD 1997; Department 2001). Prior to human modification, the littoral zone of Lake Okeechobee was connected to the Everglades marsh and would deliver sheet flow runoff to the Everglades. Following hurricanes in 1926 and 1928, which led to massive flooding from Lake Okeechobee, the Okeechobee Flood Control District was formed to manage better the lake levels. In 1937, the flood control levee (Herbert Hoover Dike) and a rim canal around the southern rim of the lake and northern rim near the town of Okeechobee were completed. Both were designed to control flooding and manage lake levels. By the late 1950s, the Central and South Florida (C&SF) Project was mostly completed, finishing the Hoover Dike around the entire lake, for a total of approximately 140 miles of canals, control structures (*e.g.*, gates, locks, and pumps), and levees in place to control Lake Okeechobee and its watershed flows. Today, the SFWMD and USACE regulate these structures (SFWMD 1997; Department 2001).

2.3 WATER QUALITY TRENDS

Lake Okeechobee TP loading rates can vary in response to multiple factors, including climate conditions, land use changes, and water management changes (SFWMD *et al.* 2014). **Table 5** shows the measured TP loads to Lake Okeechobee for CY2001–12 and WY2013. These two different periods are shown to illustrate the large variations in TP loads from year to year, which can be attributed to various factors, such as rainfall patterns. Two major hurricane years, 2004 and 2005, occurred during this period of record (POR) and contributed to high discharges to the lake.

TABLE 5: TP LOADS TO LAKE OKEECHOBEE FOR CALENDAR YEARS 2001–12 AND WY2013

SUB-WATERSHED	AVERAGE 2001–12 TP LOAD (MT/YR)	AVERAGE 2001–12 TP LOAD (KG/YR)	PERCENT (%)	2013 TP LOAD (MT/YR)	2013 TP LOAD (KG/YR)	PERCENT (%)
East Lake Okeechobee	26.5	26,500	5.2%	36.7	36,700	6.9%
Fisheating Creek	70.3	70,300	13.7%	47.6	47,600	8.9%
Indian Prairie	103	103,000	20.1%	105.8	105,800	19.8%
Lake Istokpoga	34.8	34,800	6.8%	31.8	31,800	6.0%
Lower Kissimmee	62	62,000	12.1%	96.5	96,500	18.1%
South Lake Okeechobee	19.7	19,700	3.8%	29	29,000	5.4%
Taylor Creek/Nubbin Slough	98.9	98,900	19.3%	137	137,000	25.7%
Upper Kissimmee	87.5	87,500	17.1%	48.7	48,700	9.1%
West Lake Okeechobee	9.8	9,800	1.9%	0.4	400	0.1%
Total	**512**	**512,000**	**100.0%**	**534**	**534,000**	**100.0%**

Attainment of the Lake Okeechobee TMDL is calculated based on a five-year rolling average using the monthly loads calculated from measured flow and concentration values (Department 2001). The highest five-year average load was 714 MT during the WY2002–06 POR. The most recent five-year POR (WY2009–13) was 451 MT. This load exceeded the TMDL of 105 MT by 311 MT and was a 17% increase from the previous five-year POR (WY2008–12) load of 387 MT. During WY2013, the load to Lake Okeechobee from all of the sub-watersheds and their individual basins was 569 MT, including 35 MT for atmospheric deposition (SFWMD 2014). The largest load (137 MT) was from the Taylor Creek/Nubbin Slough Sub-watershed, and the smallest load (0.4 MT) was from the West Lake Okeechobee Sub-watershed.

Table 6 shows the average TP concentrations to Lake Okeechobee for CY2001–12 and WY2013. The concentrations do not include concentrations from atmospheric deposition. These two different periods are shown to illustrate the large variations in TP concentrations from year to year. The Taylor Creek/Nubbin Slough Sub-watershed has the highest TP concentration of 558 parts per billion (ppb) from 2001–12 and 533 ppb in WY2013. The lowest concentration observed was in the Upper Kissimmee Sub-watershed, which had an average TP concentration of 86 ppb from 2001–12 and a measured concentration of 90 ppb for WY2013.

TABLE 6: TP CONCENTRATIONS TO LAKE OKEECHOBEE FOR CY 2001–12 AND WY 2013

SUB-WATERSHED	AREA (ACRES)	2001–12 TP CONCENTRATION (PPB)	2013 TP CONCENTRATION (PPB)
East Lake Okeechobee	239,012.5	173	151
Fisheating Creek	318,042.2	234	189
Indian Prairie	276,577.2	317	286
Lake Istokpoga	394,203.3	103	92
Lower Kissimmee	429,187.6	150	185
South Lake Okeechobee	363,141.2	166	253
Taylor Creek/Nubbin Slough	197,795.0	558	533
Upper Kissimmee	1,028,421.3	86	90
West Lake Okeechobee	204,094.1	138	72

Numerous SFWMD monitoring programs collected the data utilized for both the load calculations and average concentrations. The monitoring efforts and subsequent data provide this real-world picture of the current loadings and average concentrations in the LOW.

Chapter 3: POLLUTANT SOURCES AND ANTICIPATED OUTCOMES

3.1 SUMMARY OF SOURCES IN THE WATERSHED

There are various sources of pollution in the LOW (SFWMD 1997; Department 2001). Nonpoint sources in the LOW contribute the majority of the TP load to Lake Okeechobee and include agriculture and stormwater runoff. Several reports (SFWMD; Department; FDACS; periodic LOPP updates; SWET 2008; SWET 2010) document more detailed information regarding phosphorus imports for the LOW. At the moment, the SWET efforts provide both measured and modeled information about nutrient conditions and loading in the watershed. However, conditions and practices have changed since that analysis was completed, and the Department intends to rely on the updated WAM modeling to refine loading estimates and sources of phosphorus. Additional details about the sources included in this BMAP are provided in the subsections below.

3.1.1 MS4s

Many of the municipalities in the basin are regulated by the Florida NPDES MS4 Program. An MS4 is a conveyance or system of conveyances such as roads with stormwater systems, municipal streets, catch basins, curbs, gutters, ditches, constructed channels, or storm drains that has the following characteristics:

- Is owned or operated by a state, city, town, county, special district, association, or other public body (created by or under state law) having jurisdiction over the management and discharge of stormwater and that discharges to surface waters of the state.
- Is designed or used for collecting or conveying urban stormwater.
- Is not a combined sewer.
- Is not part of a Publicly Owned Treatment Works (POTW), which refers to any device or system used in the treatment of municipal sewage or industrial wastes of a liquid nature, which is owned by a state or municipality. This definition includes sewers, pipes, or other conveyances only if they convey wastewater to a POTW providing treatment.

An MS4 can be operated by municipalities, counties, drainage districts, colleges, military bases, or prisons, to name a few examples. By definition, the components of an MS4 system do not include waters of the state of Florida or of the United States. Instead, the MS4 ultimately discharges into such waters.

The basic requirements of the program serve as a foundation for the stormwater management efforts of these communities. The U.S. Environmental Protection Agency (EPA) developed the federal NPDES stormwater permitting program in two phases. Phase I, which began in 1990, addresses large and medium MS4s located in incorporated areas and counties with populations of 100,000 or more, as well as specific industrial activities. Phase II, which started in 1999, addresses small MS4s that are designated according to population and other criteria established in federal and state rules. Small MS4s include MS4s located in an urbanized area that have a population of at least 50,000 people and/or serve a population of 1,000 or more people per square mile.

In October 2000, the EPA authorized the Department to implement the NPDES stormwater permitting program in the state. This permitting has remained separate from state Stormwater/Environmental Resource Permit (ERP) Programs and local stormwater/water quality programs, which have their own regulations and permitting requirements. Florida's rules for MS4s can be found in Chapters 62-4, 62-620, 62-621, and 62-624, F.A.C.

In addition to compliance with existing NPDES permit conditions, MS4s must also undertake projects specified in a BMAP. The BMAP projects required by MS4s are detailed in **Appendix A**. Entities responsible for implementation have submitted these projects and activities to the Department with the understanding that the projects and activities would be included in the BMAP, thus setting the expectation of each entity to implement the proposed projects and activities to achieve the assigned load reduction estimates in the specified time frames. Any change in listed projects and activities, or the deadline to complete these actions, must first be approved by the Department. Substituted projects must result in equivalent or greater nutrient reductions than expected from the original projects.

In addition, both Phase I and Phase II MS4 permits include provisions for revising the effluent limitations, monitoring requirements, and stormwater management programs to meet applicable TMDL allocations that are consistent with the assumptions and requirements of the adopted BMAP.

3.1.1.1 Phase I MS4 Stormwater Permit Requirements

Table 7 lists the local governments in the six northern sub-watersheds that are designated as Phase I MS4s. Phase I MS4 permittees were subject to a two-part application process requiring the development of a proposed stormwater management program that would meet the standard of reducing discharged pollutants to the maximum extent practicable and incorporation of the stormwater management program into an individual permit issued to the MS4 operator. The stormwater management programs for Phase I MS4s include, but are not limited to, the following measures:

- Identify major outfalls and pollutant loadings.
- Detect and eliminate nonstormwater discharges (illicit discharges) to the system.
- Reduce pollutants in runoff from industrial, commercial, and residential areas.
- Control stormwater discharges from new development and redevelopment areas.
- Implement a monitoring program.

To avoid the need for reopening MS4 permits each time a TMDL or BMAP is adopted, the following language is included in the Phase I MS4 permits that automatically requires the implementation of any stormwater requirements in an adopted BMAP. This "TMDL clause" states: "*In accordance with Section 403.067, F.S., NPDES permits must be consistent with the requirements of adopted TMDLs. Therefore, when a Basin Management Action Plan (BMAP) and/or an implementation plan for a TMDL for a water body into which the permitted MS4 discharges the pollutant of concern is adopted pursuant to Section 403.067(7), F.S., the MS4 operator must comply with the adopted provisions of the BMAP and/or implementation plan that specify activities to be undertaken by the permittee during the permit cycle."*

TABLE 7: LOCAL GOVERNMENTS IN THE SIX NORTHERN SUB-WATERSHEDS DESIGNATED AS PHASE I MS4S

PERMITTEE	PERMIT NUMBER
Reedy Creek Improvement District	FLS000010
City of Belle Isle	FLS000011
City of Edgewood	FLS000011
Orange County	FLS000011
Valencia Water Control District	FLS000011
FDOT District 1	FLS000015
FDOT District 5	FLS000011
City of Orlando	FLS000014
City of Davenport	FLS000015
Town of Dundee	FLS000015
City of Frostproof	FLS000015
City of Haines City	FLS000015
City of Lake Wales	FLS000015
Village of Highland Park	FLS000015
Town of Hillcrest Heights	FLS000015
Polk County	FLS000015

3.1.1.2 Phase II MS4 Stormwater Permit Requirements

All of the Phase II MS4s in the six northern sub-watersheds are listed in **Table 8**. Under a generic permit, operators of regulated Phase II MS4s must develop a stormwater management program that includes BMPs with measurable goals to effectively implement the following six minimum control measures:

- **Public Education and Outreach** – Perform educational outreach regarding the harmful impacts of polluted stormwater runoff.
- **Public Participation/Involvement** – Comply with state and local public notice requirements and encourage other avenues for citizen involvement.
- **Illicit Discharge Detection and Elimination** – Implement a plan to detect and eliminate any nonstormwater discharges to the MS4 and create a system map showing outfall locations. Subsection 62-624.200(2), F.A.C., defines an illicit discharge as "…any discharge to an MS4 that is not composed entirely of stormwater…," except discharges under an NPDES permit, or those listed in rule that do not cause a violation of water quality standards. Illicit discharges can include septic/sanitary sewer discharge, car wash wastewater, laundry wastewater, improper disposal of auto and household toxics, and spills from roadway accidents.
- **Construction Site Runoff Control** – Implement and enforce an erosion and sediment control program for construction activities.
- **Post-Construction Runoff Control** – Implement and enforce a program to address discharges of postconstruction stormwater runoff from new development and redevelopment areas. (**Note**: This minimum control is generally met through state stormwater permitting requirements under Part IV, Chapter 373, F.S., as a qualifying alternative program.)
- **Pollution Prevention/Good Housekeeping** – Implement a program to reduce pollutant runoff from municipal operations and property and train staff in pollution prevention.

The Phase II generic permit (Paragraph 62-621.300[7][a], F.A.C.) also has a self-implementing clause, as follows, that compels a permittee to implement its stormwater pollutant load responsibilities within an adopted BMAP: *"If a TMDL is approved for any waterbody into which the Phase II MS4 discharges, and the TMDL includes requirements for control of stormwater discharges, the operator must review its*

stormwater management program for consistency with the TMDL allocation. If the Phase II MS4 is not meeting its TMDL allocation, the operator must modify its stormwater management program to comply with the provisions of the TMDL Implementation Plan applicable to the operator in accordance with the schedule in the Implementation Plan."

TABLE 8: LOCAL GOVERNMENTS IN THE SIX NORTHERN SUB-WATERSHEDS DESIGNATED AS PHASE II MS4S

PERMITTEE	PERMIT NUMBER
City of Kissimmee	FLR04E064
City of St. Cloud	FLR04E112
FDOT District 1	FLR04E147
FDOT District 4	FLR04E083
FDOT District 5	FLR04E024
FDOT Florida's Turnpike Enterprise	FLR04E049
Osceola County	FLR04E012
Town of Windermere	FL04E063
Highlands County	FLR04E148
Okeechobee County	FLR04E140
City of Avon Park	In Progress
City of Sebring	In Progress

The Department can designate an entity as a regulated Phase II MS4 if its discharges meet the requirements of the rule and are determined to be a significant contributor of pollutants to surface waters of the state in accordance with Rule 62-624.800, F.A.C. The designation of an entity as a Phase II MS4 can occur when a TMDL has been adopted for a waterbody or segment into which the entity discharges the pollutant(s) of concern. If an entity is designated as a regulated Phase II MS4, it is subject to the conditions of the Phase II MS4 Generic Permit. If an entity is listed but is not located entirely within an urbanized area, only the portion within the urbanized area will be regulated under the MS4 program per Subsection 62-624.800(l)(a), F.A.C., unless the urbanized area is included in a regulated Phase I or Phase II MS4, when duplicative regulation will not be required. **Section 3.1.3** of this BMAP describes the obligations of agricultural nonpoint sources.

3.1.2 URBAN NONPOINT SOURCES

Reductions in loads carried by stormwater that are separate from discharges by a permitted MS4 were established in the "load allocation" component of the TMDL. Sub-subparagraph 403.067(7)(b)2.f, F.S., prescribes the pollutant reduction actions required for nonagricultural pollutant sources that are not subject to NPDES permitting. "Non-MS4 sources" must also implement the pollutant reduction requirements

detailed in a BMAP and are subject to enforcement action by the Department or a water management district if they fail to implement their responsibilities under the BMAP. The nonpoint sources in the six northern sub-watersheds are listed in **Table 9.**

TABLE 9: URBAN NONPOINT SOURCES IN THE SIX NORTHERN SUB-WATERSHEDS

TYPE OF ENTITY	PARTICIPANT
Municipalities	City of Moore Haven City of Ocoee Town of Lake Hamilton Town of Lake Placid Village of Highland Park
Special Districts	Coquina Water Management District Istokpoga Marsh Improvement District Spring Lake Improvement District

3.1.3 AGRICULTURAL NONPOINT SOURCES

The primary agricultural land uses in the LOW are improved pastures, unimproved pastures, citrus groves, and woodland pastures. Other agricultural land uses include field crops (*e.g.*, sugar cane), dairies, croplands and pasture, row crops, tree nurseries, specialty farms, and ornamentals. Per Section 403.067, F.S., all agricultural nonpoint sources in the BMAP area are statutorily required either to implement appropriate BMPs or to conduct water quality monitoring that demonstrates compliance with state water quality standards. This is discussed in more detail in **Section 5.6**.

3.1.4 AQUACULTURE

Under the Clean Water Act, aquaculture activities are defined as a point source. Starting in 1992, the Department and/or the water management districts regulated all aquaculture facilities through a general fish farm permit authorized by Section 403.814, F.S. In 1999, the Florida Legislature amended Chapter 597, F.S., Florida Aquaculture Policy Act, to create a program within FDACS that requires Floridians who sell aquatic species to annually acquire an Aquaculture Certificate of Registration and implement Chapter 5L-3, F.A.C., Aquaculture BMPs. This requirement is not an option for aquaculturists, and they may not sell their production unless they are certified. In the LOW, 765.72 acres of aquaculture are under certification with the Division of Aquaculture.

3.2 ANTICIPATED OUTCOMES OF BMAP IMPLEMENTATION

With the implementation of the projects outlined in this BMAP, the nutrient loads to Lake Okeechobee and within the LOW are expected to be reduced. The following outcomes are expected from BMAP implementation:

- Improvement in water quality trends in the LOW.
- Decreased loading of TP and TN. Although the TMDL is specific to TP, many of the management activities identified in the BMAP will also reduce TN loads to the lake.
- Decreased loading of TP and TN to the St. Lucie and Caloosahatchee Estuaries.
- Increased coordination among state and local governments and within divisions of local governments in problem solving for surface water quality restoration.
- Determination of effective projects through the stakeholder decision-making and priority-setting processes.
- Enhanced public awareness of stormwater runoff, pollutant sources, pollutant impacts on water quality, and corresponding corrective actions.
- Enhanced understanding of basin hydrology, water quality, pollutant sources, and legacy loads.

Chapter 4: WATERSHED LOAD ESTIMATES

4.1 DEVELOPMENT OF LOAD ESTIMATION TOOL

The load estimation tool is a Geographic Information System (GIS) dataset that covers the six sub-watersheds north of Lake Okeechobee:

- Upper Kissimmee.
- Lower Kissimmee.
- Lake Istokpoga.
- Indian Prairie.
- Fisheating Creek.
- Taylor Creek/Nubbin Slough.

These sub-watersheds were defined in the September 2013 hydrologic boundary geodataset. This identifies the boundaries and names of the sub-watersheds and basins in the LOW as determined by the SFWMD as part of its 2014 LOPP Update. The load estimation tool also identifies the land use classification used in the WAM, polygon area in hectares, specific unit loading rates by land use type in each sub-watershed, and attenuation rates.

4.1.1 WAM

WAM is a water-quality model that performs daily nutrient and sediment load calculations. It organizes and displays data through GIS, and the model has the capability to simulate TP and TN nutrient loads from a watershed through surface runoff, ground water pathways, and in-stream nutrient transport. Nutrient loads created in a given watershed are determined based on environmental conditions, including rainfall, land use type, soil type, surface topography, and potential ground water relationships. WAM can also include the simulation of point source loads, regional ground water nutrient loads, upstream boundary nutrient loads, and atmospheric deposition of nutrient loads directly onto the surface of receiving waters.

Phosphorus loading results simulated by a set of 11 WAM domains were used to create the tool. The data covered a POR of 1978–2010, and the NRCS Soil Survey Geographic Database (SSURGO) data and Digital Elevation Model (DEM) were used in each of the 11 domains.

4.1.1.1 Linkage of WAM Land Use Classification with SFWMD's Land Use Geodataset

The 2008–09 land use geodataset for the LOW obtained from the SFWMD was used as the basis of the load estimation tool. The land use geodataset consists of 2009 land uses that were updated by the SFMWD in 2013. This dataset includes the portions of the SFWMD, St. Johns River Water Management District, and Southwest Florida Water Management District territories that contribute to Lake Okeechobee. Some Florida Land Use and Cover Classification System (FLUCCS) codes included in this geodataset were updated by the SFWMD. These updates were based on the most recent land use survey information, and additional land use classifications were added, such as the inactive dairy classification. The land use update primarily focused on converting portions of areas of residential development, nonspecific agricultural, forest, water, wetlands, and transportation and utility areas into improved pastures, dairies, and inactive dairies, which are the areas with the most influence on potential loading factors.

The load estimation tool summarizes the nutrient loads generated from different locations based on common land use type identification. To achieve this function, the unit hectare TP and TN loads were assigned to respective land use sources. Since the loading results were obtained from WAM domains, a link between each WAM domain's land use classification and the updated FLUCCS codes, by the geographic extent of each model domain, was established. Using this link, the WAM land use classification system was integrated into the 2009 land use geodataset provided by the SFWMD (refer to **Appendix B**).

4.1.1.2 BMPs in the WAM

For the WAM simulation, agricultural practices commonly adopted by farmers that result in reduced nutrient loads were included as part of the WAM loading simulation. The general urban BMPs required by the urban stormwater rule were also included in the WAM modeling.

In addition to the common agricultural practices, higher phosphorus removal rates were assigned to the citrus groves and dairies in the S-191 basin. This resulted in an 18% and 27% decrease of unit areal TP loads for the citrus grove and dairy areas, respectively (**Table 10**).

TABLE 10: TP LOAD ADJUSTMENT FACTORS FOR DAIRIES AND CITRUS GROVES IN THE S-191 WAM DOMAIN

WAM LAND USE CLASSIFICATION SYSTEM	WAM LAND USE DESCRIPTION	TP LOAD ADJUSTMENT FACTOR
39	Dairies	1.18
84	Citrus Groves	1.27

4.1.1.3 WAM Revision Schedule

The Coordinating Agencies are currently working on a contract with SWET to revise the WAM so that the model covers all nine sub-watersheds in the LOW. The WAM revisions, including the addition of more data and information, will allow for more refined model runs and estimates, which will ultimately assist in addressing implementation priorities. Below is the schedule in **Table 11**.

TABLE 11: SCHEDULE FOR WAM REVISIONS

ACTION	COMPLETION DATE
Develop scope of work for contract.	Fall 2014
Execute contract.	Fall 2014
Complete WAM refinements.	Winter 2015/2016
Conduct pre-drainage characterization and sensitivity/uncertainty analyses.	Spring 2016
Use WAM results to update sub-watershed existing loads and project nutrient reduction benefits in the northern sub-watersheds and to develop existing loads in the southern sub-watersheds and calculate project nutrient reduction benefits.	Fall 2016
Identify elevated TP areas for additional project locations and prioritization.	Winter 2016/2017

4.2 CALCULATION OF EXISTING LOADS

4.2.1 UNIT TP LOADS FOR DIFFERENT LAND USE TYPES

The unit hectare TP loads for different land use types were obtained from the 11 WAM domains. The unit load is a long-term average annual per hectare TP load for each land use type, which was obtained by combining WAM's nutrient loading information with its land use information. These unit area loading results are referred to as unattenuated loads, which represent the unit loads at the source and include no watershed and receiving water attenuation. The unit TP loads are incorporated into the load estimation tool for each WAM land use type using the link between the updated (2009 Land Use) FLUCCS code and WAM land classification system.

4.2.2 ATTENUATION RATES

The load estimation tool uses the unattenuated land use–specific TP areal loads and total TP attenuation rate averaged across each model domain, including both the TP attenuation during the watershed transport and the in-stream attenuation after the watershed loads reach receiving waterbodies. The unattenuated TP areal loads represent the TP loads at the source, which includes both the runoff and ground water loads. Because a TMDL represents the total loads that a given waterbody can take from all the possible sources, ground water TP loads should not be excluded from the TMDL allocation equation.

The total attenuation rate in each model domain was calculated using the following equation:

Total Attenuation Rate = (Total Inlet Load – Total Outlet Load)/ Total Inlet Load

The total inlet load is the sum of the TP loads entering a given WAM domain from all sources, including the load from the immediate area (including atmospheric deposition load directly onto the receiving waterbodies), possible boundary TP loads from upstream WAM domains (only applicable to the Lower Kissimmee C-38 Canal model domain), and possible backflow from the downstream model domain because of the hydrodynamic condition.

The total outlet load includes TP loads leaving a given WAM domain through all outfall reaches that, either directly or through downstream WAM domains, eventually reach Lake Okeechobee.

Table 12 shows the attenuation rates or factors, which ranged from 0.117 or 11.7% in the Indian Prairie Sub-watershed to 78.3% in Upper Kissimmee Sub-watershed. These two sub-watersheds have high attenuation rates because of the many lakes distributed along the reach networks. The Lake Istokpoga Sub-watershed also has a high attenuation rate of 75.0%. It should be noted that project reductions calculated for the purpose of determining local impacts may be greater than those calculated specifically to estimate the reductions realized at the inflow to Lake Okeechobee.

TABLE 12: ATTENUATION FACTORS

SUB-WATERSHED WAM DOMAIN	ATTENUATION FACTOR
Fisheating Creek – FEC domain	0.470
Fisheating Creek – L61W domain	0.253
Fisheating Creek – Lower C38 domain	0.302
Fisheating Creek – S131 domain	0.318
Indian Prairie – L48 domain	0.117
Indian Prairie – L49 domain	0.189
Indian Prairie – L61W domain	0.253
Indian Prairie – Lower C38 domain	0.302
Indian Prairie – S131 domain	0.318
Lake Istokpoga	0.750
Lower Kissimmee	0.302
Taylor Creek/Nubbin Slough – Lower C-38 domain	0.302
Taylor Creek/Nubbin Slough – S133 domain	0.158
Taylor Creek/Nubbin Slough – S135 domain	0.244
Taylor Creek/Nubbin Slough – S191 domain	0.240
Upper Kissimmee	0.783

4.2.3 TP LOAD CALCULATIONS

The final model watershed TP loads (TP_Load) eventually reaching Lake Okeechobee were calculated using the equation below, and these existing loads are located in **Table 13**.

TP_Load = Sum of [Areal_TP *Area_Hecta*(1-Attenu_TP)]

Where,

- TP_Load is the TP load that eventually reaches Lake Okeechobee in kilograms per year (kg/yr). This number can be converted into MT/yr.
- Areal_TP is the unit hectare loads for TP in kilograms per hectare. This number can be converted into MT/yr.
- Area_Hecta is the area for a given land use type in hectares.
- Attenu_TP is the attenuation factor as shown above in **Table 12**.

The Lower Kissimmee Sub-watershed contributes the largest load, with 103.0 MT/yr, or 23% of the total loads entering Lake Okeechobee. The Lake Istokpoga Sub-watershed contributes the smallest load (26.2 MT/yr, or 6%) to Lake Okeechobee. Using the existing loads (**Table 13**) and the water quality concentrations and flows reported in **Table 4, Table 5,** and **Table 6**, the Department determined that the sub-watersheds with the highest discharges are Upper and Lower Kissimmee; therefore, additional water storage projects should be placed in these areas. The Taylor Creek/Nubbin Slough Sub-watershed has high TP loading, and so the Coordinating Agencies will target this sub-watershed for dairy remediation projects. To date, this sub-watershed has the most regional projects out of the six northern sub-watersheds as the Coordinating Agencies recognize the need for water quality improvement. The Indian Prairie Sub-watershed has high loading, and so the Coordinating Agencies are working with Lykes Brothers, Inc. to implement the Brighton Valley Project.

TABLE 13: TP EXISTING LOADS

SUB-WATERSHED	AREA (ACRES)	WATERSHED TP LOADS (MT/YR)	WATERSHED TP LOADS (KG/YR)	PERCENT LOADS (%)
Fisheating Creek	318,042.20	79	79,000	18%
Indian Prairie	276,577.20	72.7	72,700	16%
Lake Istokpoga	394,203.30	26.2	26,200	6%
Lower Kissimmee	429,187.60	103	103,000	23%
Taylor Creek/Nubbin Slough	196,733.10	100.8	100,800	22%
Upper Kissimmee	1,028,421.30	66.6	66,600	15%
Total TP Loads from Northern LOW	2,643,164.70	448.3	448,300	100%

Chapter 5: MANAGEMENT STRATEGIES

The coordinating agencies (Department, SFWMD, and FDACS) are evaluating options to improve overall implementation of the nonpoint nutrient source control programs within the NEEPP. Part of this evaluation includes clearly delineating the roles and responsibilities of each agency and identifying ways to minimize duplication of effort. The Coordinating Agencies anticipate completing this evaluation by the end of March 2015, and will revise their existing Memorandum of Understanding (MOU) to incorporate their conclusions.

Appendix A includes "projects" that were completed, planned, or ongoing since January 1, 2009, and planned during the first BMAP iteration, as well as projects that are currently under development by the Coordinating Agencies and other initiatives. Public-private partnerships and regional projects represent a number of management strategies in the LOW. Municipal, regional, state, and federal agencies, as well as agricultural producers, have responsibilities under the BMAP to implement structural and nonstructural activities to reduce TP to Lake Okeechobee. This BMAP is adopted by Secretarial Order, and pursuant to Paragraph 403.067(7)(a)1, F.S., represents a phased implementation to achieve the TMDL.

Responsible entities submitted these projects and activities to the Department with the understanding that the projects and activities would be included in the BMAP, thus setting the expectation of each entity to implement the proposed projects and activities to achieve the assigned load reduction estimates in the specified time frames. This list of projects is meant to be flexible enough to allow for changes that may occur over time, provided that the reduction is still met within the specified period. Any change in listed projects and activities, or the deadline to complete these actions, must first be approved by the Department. Substituted projects must result in equivalent or greater nutrient reductions than expected from the original projects.

Projects had to meet several criteria to be considered eligible for nutrient reduction benefits under the BMAP. All projects, programs, and activities were required to address TP loads. Only projects completed, planned, or ongoing since January 1, 2009, were eligible for BMAP nutrient reduction benefits. While the Department recognizes that significant stakeholder actions have been implemented in the LOW prior to 2009, the intent of this BMAP is to focus on current, planned, and future projects to reduce TP loads to the six northern sub-watersheds to Lake Okeechobee. Projects were only given nutrient reduction benefits for the portion of the load reduction that was over and above any permit requirements. The sections below summarize the types of projects submitted to achieve the reductions for this first BMAP iteration.

Appendix A contains the BMP efficiencies that were used to calculate the project reductions. Where project-specific data were available, these data were used to assign efficiencies and corresponding reductions.

5.1 URBAN STORMWATER

The counties and municipalities in the watershed submitted a variety of projects to address nutrients in urban stormwater, including structural projects, stormwater reuse, street sweeping, and public education and outreach efforts.

The structural projects include the typical stormwater BMPs, such as wet detention ponds, dry retention, swales, baffle boxes, catch basin inserts, alum injection, continuous deflective separation (CDS) units, and Stormceptor systems. The efficiencies assigned to these projects are included in **Table A-1** in **Appendix A**.

Several of the urban stakeholders are implementing stormwater reuse projects, in which stormwater from treatment ponds is used for irrigation. The nutrient reduction benefits of these projects are determined by calculating the percentage of annual stormwater runoff that is utilized for irrigation (see **Appendix A**).

Many of the urban stakeholders within the LOW are sweeping their curbed roads. Street sweeping removes material from the road before it can be washed off into the stormwater system, where it would add nutrients to the waterbodies in the watershed. The street sweeping reductions are calculated using the Florida Stormwater Association spreadsheet tool, which utilizes information on the nutrient content of material swept from roads that was collected by MS4s across the state (see **Appendix A**).

In addition, the majority of the urban stakeholders are performing some level of public education and outreach. Eligible activities for the BMAP include implementation of the Florida Yards and Neighborhoods (FYN) Program, which includes implementing the principles of Florida Friendly Landscaping; adopting and implementating codes or ordinances for fertilizer, landscaping, irrigation, and pet waste management; and using public service announcements (PSAs), distributing informational pamphlets, giving presentations, maintaining a stormwater website, and having an illicit discharge inspection program and call-in number. Up to a 6% reduction in the modeled TP load from an entity's urban jurisdictional area was assigned based on the education and outreach efforts conducted by each entity. The load reductions for these education and outreach efforts are provisional for this first BMAP iteration. As studies continue and new information becomes available, these reductions may be adjusted in future iterations of this BMAP. If new information indicates lower efficiencies than what was estimated

for this BMAP, the entities that listed education may be required to provide additional strategies to make up for the difference in reductions. If new information indicates higher efficiencies, the entities will receive additional reductions for their education and outreach efforts. **Appendix A** summarizes the public education activities conducted by each entity and the associated load reductions.

5.2 DISPERSED WATER MANAGEMENT (DWM), PAYMENT FOR ENVIRONMENTAL SERVICES, WATER FARMING, AND OTHER ONSITE STORAGE

The legislative intent of the NEEPP includes encouraging and supporting the development of creative partnerships to facilitate or further the restoration of surface water resources in the LOW and the St. Lucie and Caloosahatchee River Watersheds. One way this is being accomplished is through the DWM Program. The goals and objectives of the DWM Program are to provide shallow water storage, retention, and detention to enhance Lake Okeechobee and estuary health by changing discharge timing and discharge volumes, reducing nutrient loading to downstream receiving waters, and expanding ground water recharge opportunities.

Starting in late FY2014, the District kicked off an effort to reevaluate hydrologic storage needs north of the lake with varying storage south of the lake to minimize damaging discharges to the estuaries, maintain the lake within an ecologically desirable range, and send water south for restoration. The focus of this effort is on the north storage needs, and the effort will identify the storage goals for the sub-watersheds north of the lake and determine the best tools to accomplish these goals (suitability analysis and cost-effectiveness analysis). It is anticipated that this effort will take one and a half to two and a half years to complete.

The DWM Program is a multifaceted approach to working cooperatively with public and private land owners to identify, plan, and implement mechanisms to retain or store water. The types of DWM projects included in the BMAP are Northern Everglades Payment for Environmental Services (NE-PES) projects, the Nicodemus Slough Lykes project on private lands, and two projects that were part of the NE-PES pilot program known as Florida Ranchlands and Environmental Services Projects (FRESP). With the exception of the Lykes West Waterhole Project, the primary service that is contracted under the DWM projects included in the BMAP is water storage, while water quality may be an ancillary benefit.

There are several considerations regarding DWM projects that differentiate them from other projects in the BMAP and, therefore, must be considered in how they are approached in the BMAP. DWM projects are temporary in nature, and the program was developed as an interim means to store water until larger regional projects come on line. Most of the projects involve temporary contracts with private landowners

with either five- or ten-year terms that can be terminated for convenience by either party at any time. Moreover, the continuation of these contracts to their full term is contingent upon funding. DWM projects are funded annually subject to the approval of each year's budget by the SFWMD's Governing Board. The continuation of existing projects or additions of new projects is contingent on receiving annual funding either from the state Legislature or through other funding mechanisms. In addition, SFWMD contracts contain assurances to the landowner regarding TMDLs, including assurances that the project will not be made part of a TMDL implementation plan and that the landowner will not be required to achieve equivalent load reductions as those achieved by the project upon its termination. For these reasons, DWM projects in the BMAP are considered "temporary," and the number and type of projects may change from year to year.

Furthermore, because water storage is the primary focus of this program, limited water quality data are available to establish long-term nutrient reduction efficiencies for these projects. Monitoring of water quality parameters for DWM projects with the primary purpose of water storage is not required but may be investigated to understand better the water quality benefits associated with this type of BMP. These data may then be used to develop additional DWM projects in the LOW. Water quality data are available for the Buck Island Ranch, Rafter T Ranch, West Waterhole, and XL Ranch DWM projects, which were part of the FRESP pilot program for the DWM Program; therefore, these data were used to determine the nutrient reduction benefits for these projects.

For the remainder of the DWM projects included in this BMAP, the Department, in consultation with the SFWMD, determined that the best approach to calculating the nutrient reduction benefits with the limited information available was to use the acre-feet of storage for the project and the TP concentration associated with the land uses in the project area. The appropriate attenuation factor was also applied to the existing load for each of the DWMs. The nutrient reduction benefits for DWM projects are provisional and temporary.

As of September 2014, SFWMD is currently under contract with MacArthur Agro-Ecology Research Center "Buck Island" Ranch and Rafter T Realty, Inc. to implement DWM projects on these properties.

5.3 STORMWATER TREATMENT AREAS (STAS)

STAs are large-scale treatment systems, which capture stormwater runoff and/or flows from waterbodies within the watershed, and treat the water using vegetation within the system. The large-scale implementation of STAs in the Northern Everglades is a relatively new practice; therefore, limited long-

term performance data exist. Furthermore the Northern Everglades STAs differ from the EAA STA basins in upstream basin topography, soil type (mucks vs. sands), and the range of phosphorus concentrations flowing into the STAs. The design treatment goals are also different, and so the experience gained in the EAA STAs is not always applicable to the Northern Everglades facilities.

SFWMD will gain experience operating the Lakeside and Taylor Creek STAs over the next several years. This knowledge will be applied to future northern construction projects, operational strategies, vegetation management, and the integration of future STAs with other project features, such as reservoirs or hybrid wetland treatment technologies. The estimated reductions associated with these projects are shown in **Appendix A**, and the reductions will be refined as additional long-term data become available.

Expected nutrient reductions for these projects are based on the engineering design calculations, and are shown in the tables in **Appendix A**. The appropriate attenuation factor was also applied to the existing load for each of the STAs.

5.3.1 LAKESIDE RANCH PHASE II

The Lakeside Ranch STA is in the Taylor Creek/Nubbin Slough Sub-watershed. This project, expedited under the NEEPP, is a 2,700-acre STA in western Martin County on lands adjacent to Lake Okeechobee. This STA is also a feature of the Lake Okeechobee Watershed Project, a Comprehensive Everglades Restoration Plan (CERP) "project component," as defined in Section 373.1501, F.S.

The Lakeside Ranch STA Project is designed in two phases. Phase I is a 1,200-acre STA (North STA) and the S-650 pump station, and construction was completed in 2012. Phase II will include the construction of a southern STA with an effective treatment area of 788 acres, a new pump station at structure S-191, and a discharge canal. Phase II of the STA will also be able to recirculate water from the lake, which may provide the potential for internal TP removal. The fnal design of Phase II STA South was completed in December 2011. The final design for the S-191A pump station (Phase II) was completed in February 2012. **Table 14** shows the draft schedule for this project should funding become available.

TABLE 14: SCHEDULE FOR LAKESIDE RANCH PHASE II

ACTION	TIME FRAME
Obtain USACE permit.	One Year
Procure contractor and, if necessary, perform any final design work.	6–12 Months
Construct STA South and obtain certification.	24–29 Months
Construct S-191A pump station construction and certification.	31–40 Months
Conduct start-up operations.	6–12 Months
Conduct full operations.	79–105 Months (6.5-9 Years)

5.4 HYDROLOGIC RESTORATION

The SFWMD has several completed and planned hydrologic restoration projects in the LOW. The purpose of these projects is to restore more natural flow in the project areas to help attenuate regional stormwater and restore habitat, while improvements in water quality are ancillary. The largest of these projects in the watershed is the Kissimmee River Restoration project; completion is anticipated in 2019. Long-term water quality data do not exist for this project or this scale of restoration; therefore, the reductions will be refined as additional long-term data become available.

Reductions for the Kissimmee River Restoration were based on work done by other researchers. It was estimated that the restored Kissimmee River floodplain could reduce the incoming TP load at S-65D (the ending point for the restoration project) by 20% to 25%. Adding in the additional TP coming from the Pool E Basin, an overall 19% reduction at S-65E was calculated. The appropriate attenuation factor was also applied to the existing load for each of the hydrologic restorations. The SFWMD also has five other restoration projects in the LOW. The reductions for these other restoration projects are based on engineering design reports with the sub-watershed attenuation factor applied (see **Appendix A** for the TP reduction benefits).

5.5 HYBRID WETLAND TREATMENT TECHNOLOGIES (HWTT) AND FLOATING AQUATIC VEGETATION TREATMENT (FAVT) SYSTEMS

HWTT is a combination of chemical treatment and wetland technologies designed to remove phosphorus at the sub-basin and parcel scales. FAVT uses floating aquatic vegetation for the reduction of phosphorus. There are currently five active or planned HWTT facilities and one FAVT facility in the LOW. The large-scale implementation of these technologies is a relatively new practice; therefore, limited long-term performance data exist. For the purposes of this BMAP, load reductions were estimated by multiplying the estimated flow capacity of each system (based on 75% of the full design capacity) and the inflow TP concentration to the system. The appropriate attenuation factor was also applied to the existing load for

each of the HWTT and FAVT systems. The reductions associated with these projects are shown in **Appendix A**, and the reductions will be refined as additional long-term data become available.

5.6 AGRICULTURAL BMPS

FDACS implements a nonpoint source BMP program for agricultural lands, as described in the following sections. The Coordinating Agencies' responsibilities described in this section will be consistent with the changes in the MOU discussed in the introductory paragraph for **Chapter 5**. Nutrient reduction efficiencies for agricultural BMPs were developed for the LOW through extensive literature review, modeling projects, and observed data, considering factors such as soil type, land use, rainfall, and commodity-specific management practices (SWET 2008). For purposes of estimating nutrient reductions from agriculture, all agricult ural lands are assumed to be enrolled in the FDACS BMP program, excluding properties that were enrolled in FDACS BMPs prior to 2009. This is consistent with the methodology used for estimating nutrient reductions from urban BMPs.

FDACS provides cost-share funds, which are primarily used for implementation of structural BMPs that are otherwise not economically feasible for individual producers. For the purposes of this BMAP, a 5% reduction of the TP load estimated using the load estimation tool was attributed to parcels where FDACS cost-share funds were spent for water control structures. This is consistent with the low end of efficiencies for these cost-shared activities for agricultural operations. As additional project-specific information becomes available, this methodology will be refined to better reflect nutrient reduction benefits at the parcel level based on the specific nutrient management practice.

5.6.1 AGRICULTURE

Land use data are helpful as a starting point for estimating agricultural acreage and developing BMP implementation strategies; however, the Department relies on local stakeholder knowledge and coordination with FDACS to verify agricultural activities and achieve BMP implementation. One limitation of relying on land use data is that the specific agricultural activity being conducted is not always apparent. For example, some acreage under the improved pasture classification may be used for cattle grazing, some may consist of forage grass that is periodically harvested and sold for hay, and/or some may comprise a fallow vegetable field awaiting planting. Operations that fall into this land use category fertilize at different rates (*e.g.*, hay operations and some other commodities typically fertilize at or below rates recommended by the University of Florida–Institute of Food and Agricultural Sciences [UF–IFAS]); therefore, it is meaningful for the purposes of evaluating potential nutrient impacts to know specific land uses. **Figure 4** shows the approximate location of the agricultural lands in the six northern sub-watersheds.

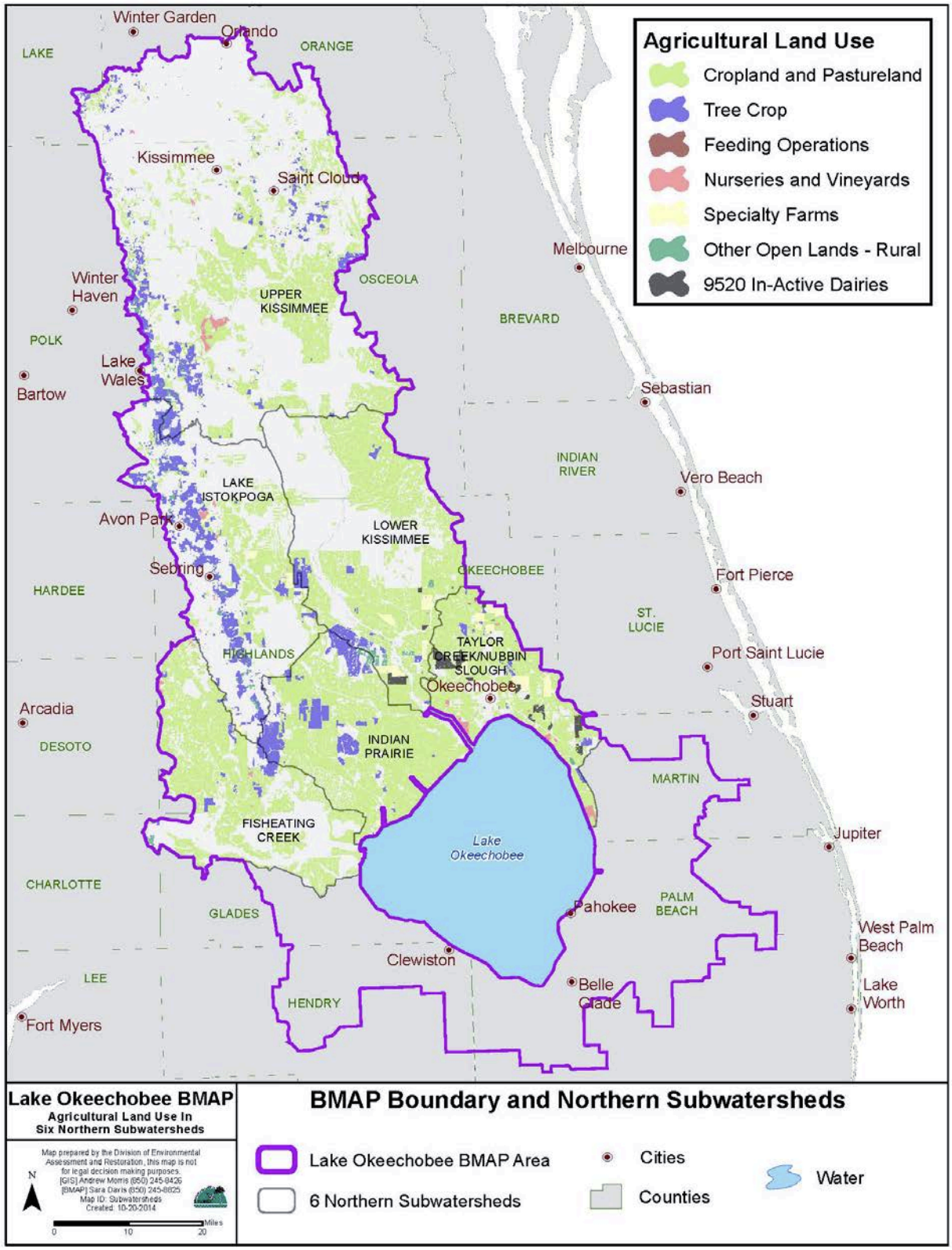

FIGURE 4: 2009 AGRICULTURAL LANDS IN THE SIX NORTHERN LAKE OKEECHOBEE SUB-WATERSHEDS

5.6.2 AGRICULTURAL PRODUCERS' RESPONSIBILITIES UNDER THE FWRA

Paragraph 403.067(7)(b), F.S., requires that nonpoint pollutant sources, such as agriculture, included in a BMAP demonstrate compliance with pollutant reductions needed to meet a TMDL, either by implementing appropriate BMPs (agricultural BMPs adopted by FDACS or urban BMPs adopted by the Department), or conducting water quality monitoring prescribed by the Department or water management district, to demonstrate compliance with water quality standards. FDACS' Office of Agricultural Water Policy (OAWP), Florida Forest Service, and Division of Aquaculture develop and adopt BMPs in coordination with the Department, UF–IFAS, and applicable producer groups. BMP manuals have been developed and adopted for eight types of agricultural commodities that represent the majority of commercial agricultural operations in Florida. Producers that choose to comply with Paragraph 403.067(7)(b), F.S., by implementing BMPs must file a signed Notice of Intent (NOI) and BMP checklist with FDACS and implement the applicable BMPs.

Under Paragraph 403.067(7)(c), F.S., the implementation of FDACS-adopted BMPs in accordance with FDACS rule provides a presumption of compliance with state water quality standards. FDACS is responsible for assisting producers in implementing agricultural BMPs to improve water quality and water conservation. Agricultural producers in a BMAP area that do not either implement BMPs or conduct monitoring may be subject to enforcement by the Department or the applicable water management district.

5.6.3 TYPES OF AGRICULTURAL BMPS

Agricultural BMPs are individual or combined practices determined through research, field testing, and expert review to be the most effective and practicable means for improving water quality, taking into account economic and technological considerations. FDACS BMPs fall into two categories: structural and management. Structural BMPs involve the installation of structures or changes to the land. They include measures such as water control structures, fencing, and irrigation tailwater recovery systems. Management BMPs, such as nutrient and irrigation management, comprise the majority of the practices and often are not readily observable. Nutrient management addresses fertilizer type, amount, placement, and application timing, and includes practices such as soil and tissue testing to determine crop nutrient needs, application methods, and setbacks from water resources. Irrigation management is the maintenance, scheduling, and overall efficiency rating of irrigation systems.

BMP checklists allow producers to indicate whether a BMP is economically feasible, technically feasible, or otherwise appropriate on a case-by-case basis. Often, structural BMPs are more costly and may require cost-share assistance to be economically feasible. Examples are soil-moisture-sensor technology, tree-see

and remote sensing, advanced irrigation controllers, and structural improvements that require engineering and dedicated treatment systems. As BMP cost-share becomes available to the basin, FDACS will work with producers to implement applicable key BMPs that otherwise are not affordable. Some key management and structural BMPs which may be applicable to agricultural operations in the six northern sub-watersheds are as follows:

- Determining Nutrient Needs:
  - **Soil and/or Tissue Testing**: Used to base fertilizer applications on plant needs and available nutrients in the soil; helps prevent the over-application of fertilizer.
  - **Nutrient Budgeting**: Adjustment of fertilizer regime to account for other nutrient sources, such as biosolids, legumes, manure, and nutrient-laden irrigation water; helps prevent the overapplication of fertilizer.
- Managing Nutrient Application:
  - **Precision Application of Nutrients**: Use of specialized equipment for precise placement of nutrients on targeted areas at specified rates; reduces total amount used and prevents stray applications.
  - **Equipment Calibration/Maintenance**: Ensures proper functioning of equipment; prevents the misapplication or overapplication of fertilizer materials.
  - **Split Fertilizer Applications**: Multiple applications timed with optimal growth stages; allows plants to assimilate nutrients more efficiently; reduces nutrient loss in leaching and runoff.
  - **Fertigation**: Application of fertilizer through irrigation water; allows for direct nutrient application to the crop root zone and more efficient assimilation by plants, reducing nutrient loss in leaching and runoff.
  - **Controlled-Release Fertilizer**: Use of fertilizer formulations that have a controlled nutrient release curve; reduces nutrient loss to leaching and runoff.
  - **Fertilizer Application Setbacks from Waterbodies (wetlands, watercourses, sinks, springs, etc.)**: Establishes a zone where no fertilizer will be applied; reduces nutrient loadings to waterbodies.

- Managing Irrigation:
  - **Irrigation Scheduling**: Planning when to irrigate to reduce water and nutrient losses, based on available soil moisture content, evapotranspiration levels, recent rainfall, and time of day.
  - **Monitoring Soil Moisture and Water Table**: Use of devices that measure the water table level and the amount of water in the soil; is a key component of proper irrigation scheduling.
  - **Tailwater Recovery**: Use of downgradient catchment ponds to trap irrigation tailwater to be reused on cropland; reduces offsite transport of nutrients and conserves water.
  - **Water Control Structures**: To slow and/or direct the flow of stormwater.
  - **Retention/Detention Ponds**: To capture and filter or otherwise treat stormwater onsite.
  - **Filter Strips**: Vegetated strips of land designed to reduce nutrients and sediments in surface water runoff from fields, pastures, and livestock high-intensity areas before it reaches downstream waterbodies.
  - **Vegetative Buffers**: Establishment of riparian and/or wetland buffers to attenuate and assimilate nutrient- or sediment-laden surface flows coming from cropped/grazed areas.
  - **Ditch Maintenance and Retrofits**: Use of rip-rap, sediment traps, staging structures, and permanent vegetative bank cover to minimize the erosion and transport of nutrient-laden sediments.
- Livestock Management (applicable to cow/calf and equine operations):
  - **Alternative Water Sources**: Use of upland livestock watering ponds and/or water troughs; minimizes manure deposition in waterbodies.
  - **Rotational Grazing**: Movement of cattle to different grazing areas on a planned basis; prevents concentrated waste accumulations and denuding of pasture areas. This may involve fencing.

- **High-Intensity Areas Location**: Siting of cowpens, supplemental feed areas, etc., away from waterbodies to minimize nutrient loadings.

— Operations Management:

- **Fertilizer Storage**: Proper location/storage of bulk fertilizer products to prevent nutrient loadings.
- **Fertilizer Mix/Load**: Use of appropriate dedicated or temporary mix/load areas located away from waterbodies to prevent nutrient loading.
- **Employee Training**: Training provided to farm workers on how to implement BMPs.
- **Record Keeping**: Proper record keeping provides accountability in the implementation of BMPs and assists the producer in making nutrient and irrigation management decisions.

OAWP BMPs and staff contact information are available on the FDACS website. Printed BMP manuals can be obtained in the local extension office at county agricultural extension centers, or by contacting OAWP field staff.

5.6.4 FDACS OAWP ROLE IN BMP IMPLEMENTATION AND FOLLOW-UP

OAWP provides technical assistance to producers to submit NOIs and to implement the appropriate BMPs for their operations. As funding allows, OAWP also helps implement cost-share programs that leverage regional, state, and federal funds. FDACS may contract with service providers to assist with BMP implementation, including the soil and water conservation districts, UF–IFAS, and resource conservation and development councils.

In addition to assisting with enrollment of agricultural operations in the relevant BMP programs, the OAWP will do the following:

— To the greatest extent practicable, implement cost-share opportunities to maximize BMP implementation.

— Document the submitted NOIs, which will include a list of the BMPs to be implemented.

— Document the amount of total agricultural acreage covered by the NOIs.

- Assist growers in understanding and implementing BMPs properly.
- BMP Implementation Assurance – On a rotating basis by program, mail written surveys to all operations in the LOW under an active FDACS NOI to evaluate the level of BMP implementation and update information on ownership, land use, acreage, etc. In addition, to the extent that staff resources allow, conduct site visits to agricultural operations to provide feedback on BMP implementation and identify areas that need improvement.
- Through regional field staff and contractors, follow up on identified areas/operations of particular concern.
- Participate in annual BMAP reporting on enrollment and implementation efforts and estimated load reductions, new manuals adopted, and any new efforts planned. Reporting will include the number of operations in the basin that have participated in BMP Implementation Assurance surveys or site visits, and a summary of the results.

The FWRA requires that, where water quality problems are demonstrated despite the proper implementation of adopted agricultural BMPs, FDACS must re-evaluate the practices, in consultation with the Department, and modify them if necessary. Continuing water quality problems will be detected through the BMAP monitoring network and other Department and SFWMD activities. If a re-evaluation of the BMPs is needed, FDACS will also include SFWMD and other partners in the process.

One of the objectives stated in the monitoring component of this BMAP (**Chapter 6**) is "to continue to measure effectiveness of individual or collective projects in reaching TMDL target-pollutant loadings." However, it is often difficult, especially on a watershed or sub-watershed level, to segregate agricultural impacts from other sources and, therefore, to determine what load reductions may be attributed to agricultural BMPs. Monitoring efforts should include measures to control for nonagricultural impacts that may mask BMP effectiveness.

5.6.5 Department and Water Management District Roles in Agricultural BMP Implementation

The FWRA states that nonpoint source dischargers who fail either to implement the appropriate BMPs or conduct water quality monitoring prescribed by the Department or a water management district that demonstrates compliance with water quality standards may be subject to enforcement action by either of those agencies.

The Department and FDACS will work together to verify the effectiveness of BMPs (cost-share and owner-implemented activities) during the first phase of the BMAP. **Table 15** lists the timelines associated with these verification efforts. These activities will be consistent with the changes in the MOU discussed in the introductory paragraph for **Chapter 5**.

TABLE 15: COST-SHARE AND OWNER-IMPLEMENTED BMP VERIFICATION ACTIVITIES

INITIATIVE	EXPLANATION	SCHEDULE	START DATE	COMPLETION DATE
Cost-Share BMP Effectiveness Verification	FDACS and Department will develop approach to evaluate effectiveness of various types of cost-share projects.	1. Identify key cost-share projects. (Fall 2015) 2. Identify locations for effectiveness evaluation. (Winter 2015/2016) 3. Develop evaluation approach (monitoring/modeling/calculation). (Winter 2015/2016) 4. Implement cost-share projects. (Spring 2016) 5. Data evaluation. (Annually)	Fall 2015	Spring 2016
Owner-Implemented BMP Verification	FDACS and Department will develop plan for BMP verification.	1. Identify key BMPs for each commodity type in basin. (Spring 2015) 2. Identify locations of BMPs in basin. (Fall 2015) 3. Develop monitoring plan/strategy. (Winter 2015/2016) 4. Identify willing owners. (Spring 2016) 5. Begin data collection. (Summer 2016) 6. Form committee to review findings. (Winter 2016/2017) 7. Data evaluation. (Annually)	Spring 2015	Winter 2016/2017

The NOIs will document the estimated total number of acres on which applicable BMPs are implemented, not the entire parcel acreage. This is because some parcels contain nonproduction acres (such as buildings, parking lots, and fallow acres) that will not be counted on the NOIs submitted to FDACS.

In addition, FDACS BMPs are not targeted toward noncommercial agricultural activities that would be addressed more appropriately by local government or Department regulation or BMPs. Equine ranchettes, in particular, are numerous in the basin, and many have issues with manure storage and disposal, denuded areas, *etc.*, but not the acreage to resolve these issues. A joint effort between local governments, the Department, and UF–IFAS may be needed to address these more urban operations. The Department has completed a small farms equine BMP manual and plans to develop related outreach materials.

5.6.6 BMP ENROLLMENT

All agricultural nonpoint sources in the LOW BMAP area are statutorily required either to implement FDACS-adopted BMPs or to conduct water quality monitoring prescribed by the Department or water management district that demonstrates compliance with water quality standards (Paragraph 403.067[7][b], F.S.). If these pollutant sources do not either implement BMPs or conduct monitoring that demonstrates compliance with water quality standards, they may be subject to enforcement by the Department or SFWMD. Under Paragraph 403.067(7)(c), F.S., the implementation of FDACS-adopted, Department-verified BMPs in accordance with FDACS rule provides a presumption of compliance with state water quality standards.

The land use data figures for agriculture in the six northern sub-watersheds, the acreage associated with commodity types addressed by BMP manuals, the acres enrolled in BMP programs, and the additional acreages necessary to meet the 100% enrollment in the LOW are summarized in **Table 16** through **Table 21**. The acreage used to calculate the starting point agricultural nutrient load is based on 2009 SFWMD land use information. **Figure 5** contains a map of the acres enrolled in BMPs as of March 31, 2014, for the LOW.

TABLE 16A: AGRICULTURAL ACREAGE AND BMP ENROLLMENT FOR THE FISHEATING CREEK SUB-WATERSHED

N/A = Not applicable

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

2009 SFWMD LAND USE	2009 ACRES	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED AS OF DECEMBER 31, 2008[1]	ACREAGE ENROLLED JANUARY 1, 2009-SEPTEMBER 30, 2014[1]	RELATED NOIS
Citrus	7,877.3	Ridge Citrus; Flatwoods Citrus	1,630.8	4,013.3	46
Dairies	26.7	Conservation Plan Rule/Lake Okeechobee Protection Program	25.5	0.0	0
Fruit Orchards/Other Groves	45.6	Specialty Fruit and Nut	0.0	0.2	1
Ornamentals	391.2	Container Nursery	15.2	229.3	0
Pasture and Mixed Rangeland	164,507.8	Cow/Calf; Future (hay)	26,259.3	110,569.3	36
Poultry Feeding Operations	5.2	Conservation Plan Rule	0.0	0.0	0
Row/Field/Mixed Crops/Sugar Cane	832.1	Vegetable/ Agronomic Crops	127.3	665.0	0
Sod Farms	737.5	Statewide Sod	0.0	735.3	1
Tree Nurseries	123.4	Statewide Nursery; Specialty Fruit and Nut	0.0	29.0	4
Total	**174,546.8**	**N/A**	**28,058.1**	**116,241.3**	**88**

TABLE 16B: BMP ENROLLMENT AND FUTURE ENROLLMENT REQUIREMENTS FOR THE FISHEATING CREEK SUB-WATERSHED

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

CATEGORY	ACRES
Total 2009 Acres	174,546.8
Acreage Enrolled as of December 31, 2008[1]	28,058.1
Acreage Enrolled January 1, 2009-September 30, 2014[1]	116,241.3
Acreage Enrolled (as of September 30, 2014)	144,299.4
Remaining Acres To Enroll	30,247.3

TABLE 17A: AGRICULTURAL ACREAGE AND BMP ENROLLMENT FOR THE INDIAN PRAIRIE SUB-WATERSHED

N/A = Not applicable

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

2009 SFWMD LAND USE	2009 ACRES	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED AS OF DECEMBER 31, 2008[1]	ACREAGE ENROLLED JANUARY 1, 2009–SEPTEMBER 30, 2014[1]	RELATED NOIS
Citrus	30,232.6	Ridge Citrus; Flatwoods Citrus	7,512.3	19,870.3	80
Dairies	198.3	Conservation Plan Rule/Lake Okeechobee Protection Program	174.6	2.4	3
Fruit Orchards/Other Groves	125.9	Specialty Fruit and Nut	0.4	51.9	0
Horse Farm	25.4	Equine	0.0	0.3	0
Ornamentals	54.7	Container Nursery	0.0	0.4	0
Pasture and Mixed Rangeland	166,566.8	Cow/Calf; Future (hay)	26,433.9	89,091.5	61
Poultry Feeding Operations	40.2	Conservation Plan Rule	0.0	0.2	0
Row/Field/Mixed Crops/Sugar Cane	20,768.5	Vegetable/ Agronomic Crops	3,773.7	10,743.3	17
Sod Farms	0.0	Statewide Sod	0.0	0.0	5
Tree Nurseries	178.2	Statewide Nursery; Specialty Fruit and Nut	0.4	28.8	0
Total	**218,190.7**	**N/A**	**37,895.3**	**119,788.9**	**166**

TABLE 17B: BMP ENROLLMENT AND FUTURE ENROLLMENT REQUIREMENTS FOR THE INDIAN PRAIRIE SUB-WATERSHED

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

CATEGORY	ACRES
Total 2009 Acres	218,190.7
Acreage Enrolled as of December 31, 2008[1]	37,895.3
Acreage Enrolled January 1, 2009-September 30, 2014[1]	119,788.9
Acreage Enrolled (as of September 30, 2014)	157,684.3
Remaining Acres To Enroll	60,506.4

TABLE 18A: AGRICULTURAL ACREAGE AND BMP ENROLLMENT FOR THE LAKE ISTOKPOGA SUB-WATERSHED

N/A = Not applicable

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

2009 SFWMD LAND USE	2009 ACRES	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED AS OF DECEMBER 31, 2008[1]	ACREAGE ENROLLED JANUARY 1, 2009–SEPTEMBER 30, 2014[1]	RELATED NOIS
Cattle Feeding Operations	5.6	Conservation Plan Rule	0.0	0.0	0
Citrus	51,536.6	Ridge Citrus; Flatwoods Citrus	6,702.8	34,373.1	904
Dairies	3,157.9	Conservation Plan Rule/Lake Okeechobee Protection Program	2,999.0	122.0	3
Fruit Orchards/Other Groves	436.3	Specialty Fruit and Nut	0.0	162.7	2
Horse Farm	17.1	Equine	0.0	0.0	0
Ornamentals	245.8	Container Nursery	47.8	28.2	6
Pasture and Mixed Rangeland	70,324.0	Cow/Calf; Future (hay)	24,562.1	22,706.9	51
Row/Field/Mixed Crops/Sugar Cane	3,347.3	Vegetable/ Agronomic Crops	0.2	2,637.1	6
Sod Farms	180.2	Statewide Sod	0.0	172.3	3
Tree Nurseries	1,262.0	Statewide Nursery; Specialty Fruit and Nut	408.5	155.5	0
Total	**130,512.8**	**N/A**	**34,720.3**	**60,357.9**	**975**

TABLE 18B: BMP ENROLLMENT AND FUTURE ENROLLMENT REQUIREMENTS FOR THE LAKE ISTOKPOGA SUB-WATERSHED

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

CATEGORY	ACRES
Total 2009 Acres	130,512.8
Acreage Enrolled as of December 31, 2008[1]	34,720.3
Acreage Enrolled January 1, 2009-September 30, 2014[1]	60,357.9
Acreage Enrolled (as of September 30, 2014)	95,078.2
Remaining Acres To Enroll	35,434.6

TABLE 19A: AGRICULTURAL ACREAGE AND BMP ENROLLMENT FOR THE LOWER KISSIMMEE SUB-WATERSHED

N/A = Not applicable

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

2009 SFWMD LAND USE	2009 ACRES	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED AS OF DECEMBER 31, 2008[1]	ACREAGE ENROLLED JANUARY 1, 2009–SEPTEMBER 30, 2014[1]	RELATED NOIS
Cattle Feeding Operations	44.7	Conservation Plan Rule	8.7	3.2	0
Citrus	10,511.4	Ridge Citrus; Flatwoods Citrus	2,234.2	8,027.5	15
Dairies	6,479.6	Conservation Plan Rule/Lake Okeechobee Protection Program	6,066.9	50.4	9
Fruit Orchards/Other Groves	607.0	Specialty Fruit and Nut	8.5	586.2	0
Horse Farm	264.9	Equine	17.2	185.4	0
Ornamentals	17.1	Container Nursery	0.0	0.1	2
Pasture and Mixed Rangeland	185,477.4	Cow/Calf; Future (hay)	71,257.6	63,651.9	119
Row/Field/Mixed Crops	12,847.1	Vegetable/ Agronomic Crops	5,532.0	6,456.3	11
Tree Nurseries	9.3	Statewide Nursery; Specialty Fruit and Nut	0.0	0.0	0
Total	**216,258.2**	**N/A**	**85,125.0**	**78,961.2**	**156**

TABLE 19B: BMP ENROLLMENT AND FUTURE ENROLLMENT REQUIREMENTS FOR THE LOWER KISSIMMEE SUB-WATERSHED

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

CATEGORY	ACRES
Total 2009 Acres	216,258.2
Acreage Enrolled as of December 31, 2008[1]	85,125.0
Acreage Enrolled January 1, 2009-September 30, 2014[1]	78,961.2
Acreage Enrolled (as of September 30, 2014)	164,086.2
Remaining Acres To Enroll	52,172.0

TABLE 20A: AGRICULTURAL ACREAGE AND BMP ENROLLMENT FOR THE TAYLOR CREEK/NUBBIN SLOUGH SUB-WATERSHED

N/A = Not applicable

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

2009 SFWMD LAND USE	2009 ACRES	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED AS OF DECEMBER 31, 2008[1]	ACREAGE ENROLLED JANUARY 1, 2009–SEPTEMBER 30, 2014[1]	RELATED NOIS
Cattle Feeding Operations	387.1	Conservation Plan Rule	341.5	0.1	0
Citrus	3,481.4	Ridge Citrus; Flatwoods Citrus	2,029.9	976.1	8
Dairies	10,222.1	Conservation Plan Rule/ Lake Okeechobee Protection Program	9,848.3	29.4	14
Fruit Orchards/Other Groves	361.1	Specialty Fruit and Nut	229.6	32.7	0
Horse Farm	491.7	Equine	248.8	56.1	2
Ornamentals	66.5	Container Nursery	26.8	8.5	4
Pasture and Mixed Rangeland	114,984.7	Cow/Calf; Future (hay)	54,925.3	29,558.5	95
Poultry Feeding Operations	72.3	Conservation Plan Rule	0.0	0.0	0
Row/Field/Mixed Crops/Sugar Cane	6,904.0	Vegetable/ Agronomic Crops	629.5	4,876.4	11
Sod Farms	1,521.3	Statewide Sod	1,518.7	0.0	1
Tree Nurseries	2,413.7	Statewide Nursery; Specialty Fruit and Nut	232.3	2.8	0
Total	**140,905.9**	**N/A**	**70,030.7**	**35,540.5**	**135**

TABLE 20B: BMP ENROLLMENT AND FUTURE ENROLLMENT REQUIREMENTS FOR THE TAYLOR CREEK/NUBBIN SLOUGH SUB-WATERSHED

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

CATEGORY	ACRES
Total 2009 Acres	140,905.9
Acreage Enrolled as of December 31, 2008[1]	70,030.7
Acreage Enrolled January 1, 2009-September 30, 2014[1]	35,540.5
Acreage Enrolled (as of September 30, 2014)	105,571.2
Remaining Acres To Enroll	35,334.7

TABLE 21A: AGRICULTURAL ACREAGE AND BMP ENROLLMENT FOR THE UPPER KISSIMMEE SUB-WATERSHED

N/A = Not applicable

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

2009 SFWMD LAND USE	2009 ACRES	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED AS OF DECEMBER 31, 2008[1]	ACREAGE ENROLLED JANUARY 1, 2009–SEPTEMBER 30, 2014[1]	RELATED NOIS
Cattle Feeding Operations	18.9	Conservation Plan Rule	0.0	5.0	0
Citrus	47,326.5	Ridge Citrus; Flatwoods Citrus	2,838.8	25,492.1	646
Dairies	52.7	Conservation Plan Rule/Lake Okeechobee Protection Program	0.0	39.0	0
Fruit Orchards/Other Groves	1,593.0	Specialty Fruit and Nut	75.6	165.5	12
Horse Farm	220.3	Equine	0.5	2.2	1
Ornamentals	469.6	Container Nursery	5.5	96.3	24
Pasture and Mixed Rangeland	212,101.0	Cow/Calf; Future (hay)	14,256.9	61,896.6	55
Poultry Feeding Operations	102.3	Conservation Plan Rule	10.2	0.4	0
Row/Field/Mixed Crops	9,142.4	Vegetable/ Agronomic Crops	1.1	5,768.9	3
Sod Farms	3,537.4	Statewide Sod	0.0	2.2	2
Tree Nurseries	445.4	Statewide Nursery; Specialty Fruit and Nut	5.3	18.3	0
Total	**275,009.5**	**N/A**	**17,194.0**	**93,486.4**	**743**

TABLE 21B: BMP ENROLLMENT AND FUTURE ENROLLMENT REQUIREMENTS FOR THE UPPER KISSIMMEE SUB-WATERSHED

[1] The acreage enrolled includes the total acres with natural areas that fall within enrolled areas. Overlapping records are not duplicated. Estimated acreage is based on the lesser of the enrolled NOI acres or the calculated clipped parcel acres, to determine an approximate percentage of land mass enrolled in each of the sub-watersheds.

CATEGORY	ACRES
Total 2009 Acres	275,009.5
Acreage Enrolled as of December 31, 2008[1]	17,194.0
Acreage Enrolled January 1, 2009-September 30, 2014[1]	93,486.4
Acreage Enrolled (as of September 30, 2014)	110,680.4
Remaining Acres To Enroll	164,329.1

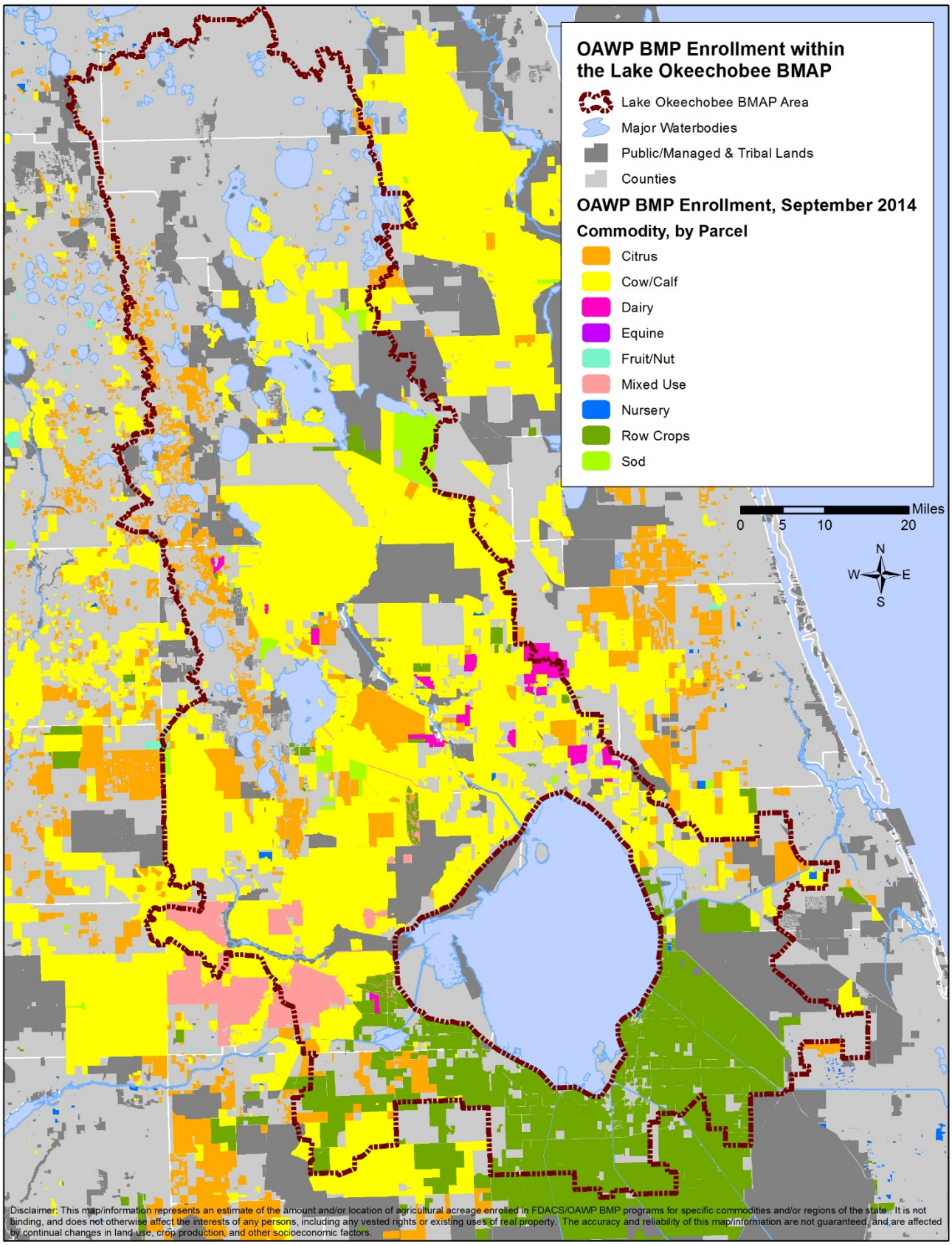

FIGURE 5: BMP ENROLLMENT IN THE LAKE OKEECHOBEE WATERSHED AS OF SEPTEMBER 30, 2014

5.6.7 BEYOND AGRICULTURAL BMPS

Under the FWRA, when the Department adopts a BMAP that includes agriculture, it is the agricultural producers' responsibility to either implement the applicable FDACS-adopted BMPs or demonstrate compliance with water quality standards by appropriate monitoring. To attain the TMDL, it may be necessary to develop and implement cost-assisted field- and/or regional-level treatment options.

In addition to producer implementation of traditional BMPs in the Lake Okeechobee BMAP area, the Department, FDACS, NRCS, and SFWMD are involved in cooperative and complementary efforts aimed at further reducing pollutant loads on agricultural lands. Examples of these efforts include the following:

- The NRCS Wetland Reserve Program (WRP) offers landowners an opportunity to establish long-term conservation and wildlife protection. The program provides technical and financial support to landowners to assist with their wetlands restoration efforts.
- FDACS Rule 5M-3, F.A.C, addresses the land application of animal manure in the Northern Everglades, which includes the Lake Okeechobee BMAP area. The rule contains minimum setbacks from wetlands and all surface waters. In addition, landowners who apply more than one ton of manure per acre must develop a conservation plan approved by NRCS. The plan must specifically address the application of animal wastes and include the use of soil testing to demonstrate the need for manure application. The use of animal manure must be documented in the operation's overall nutrient management plan.

If additional measures, such as regional treatment projects, become necessary, FDACS will work with the Department, SFWMD, and other appropriate entities to identify appropriate and feasible options.

5.7 PROJECTS UNDER DEVELOPMENT WITH COORDINATING AGENCIES

Table 22 includes projects that are under development with the Coordinating Agencies. Lakeside Ranch STA Phase II, MacArthur Agro-Ecology Research Center "Buck Island" Ranch, Rafter T Realty Inc., and Rolling Meadows Wetland Restoration-Phase II are discussed elsewhere in the chapter. These projects are in various stages of planning, but the Coordinating Agencies will work to gather details and implement these projects during the first BMAP phase.

TABLE 22: PROJECTS UNDER DEVELOPMENT WITH COORDINATING AGENCIES

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NAME	SUB-WATERSHED	STATUS	ESTIMATED TP REDUCTION (MT/YR)	ESTIMATED TP REDUCTION (KG/YR)	SCHEDULE
Istokpoga Marsh Watershed Improvement District-Phase II	Indian Prairie	Coordinating Agencies are waiting on design and engineering information from Phase I.	2	2,000	Work will begin in 2016.
Lakeside Ranch STA Phase II	Taylor Creek/Nubbin Slough	Permit, funding, and construction are needed. It is expected that project could be fully operational within 6.5 to 9 years if funding were available.	7.6	7,600	Project is estimated to be completed by 2023.
MacArthur Agro-Ecology Research Center "Buck Island" Ranch/Rafter T Realty, Inc.	Lake Istokpoga	Program implementation. SFWMD received $10 million to continue program in 2015. These two projects are currently in contract negotiations.	0.945	945	Work will commence once contracts are in place.
Brighton Valley - Lykes	Indian Prairie	Land available. Expected design, engineering, and SFWMD permitting complete by 2015 if funded to move forward. **Note:** Reduction values provided by proposer. Needs further development.	7.7	7,700	Start construction 2016. Construction complete 2017.
Rolling Meadows Wetland Restoration - Phase II	Upper Kissimmee	Land acquired and planning started.	0.009	9	Work will be completed 6.5 to 9 years after commencement of planning activities.
Inactive Dairies- Lagoon Remediation	Taylor Creek/Nubbin Slough and Indian Prairie	Develop program to remediate wastewater lagoons on inactive dairies. This is identified as potentially significant legacy load, and FDACS staff are working on identifying potential participants. Prioritization expected in early summer.	TBD	TBD	1. Identify areas for remediation activities/talk to landowners. (Winter 2014/2015-Summer 2015) 2. Procure contractors/conduct work. (Winter 2015/2016-Spring 2016) 3. Analyze data. (Yearly)
PL-566 Funded/ Fisheating Creek Structure	Indian Prairie	Natural Resources Conservation Services (NRCS) and FDACS are working on this project with Highlands County.	0.88-2.65	883-2,648	1. NRCS plans to reapply for different funding. (Fall 2014) 2. If funding obtained, work will be conducted. (2015) 3. Water quality benefit calculations will be done. (Fall 2015)
S.R. 710 Regional Project	Taylor Creek/Nubbin Slough and Indian Prairie	Feasibility study under way and expected to be complete in October 2014. Will likely require funding cooperation between Coordinating Agencies.	0.121-0.663	121-663	1. Final feasibility study due October 22, 2014. 2. Work will be implemented. (To be determined)

PROJECT NAME	SUB-WATERSHED	STATUS	ESTIMATED TP REDUCTION (MT/YR)	ESTIMATED TP REDUCTION (KG/YR)	SCHEDULE
Legislative Cost-Share Appropriation Program ($10 million annually for seven years)	All	FDACS will identify cost-share projects and nutrient reductions.	26.56	26,560	1. Develop plan and present to Department by winter 2014. 2. Implement projects by end of 2015. 3. Conduct same exercise annually.
TOTAL	**N/A**	**N/A**	**45.81-48.13**	**45,818-48,125**	**N/A**

5.8 OTHER EFFORTS

5.8.1 ALTERNATIVE BMP NUTRIENT REDUCTION PROJECTS

The Coordinating Agencies will develop a team to identify possible new strategies to achieve water quality standards. This team will be formed as soon as practicable after the adoption of the BMAP, and will meet quarterly to evaluate proposed strategies, which may be incorporated into projects in the LOW.

5.8.2 EVERGLADES HEADWATERS NATIONAL WILDLIFE REFUGE AND CONSERVATION AREA

The Everglades Headwaters National Wildlife Refuge and Conservation Area is part of an initiative of the United States Fish and Wildlife Service (USFWS) to preserve the natural resources in the Kissimmee River Valley. This multi-partnered effort will promote habitat conservation through land acquisition, permanent conservation easements, and agreements with willing landowners. The refuge and conservation area was authorized to protect 150,000 acres in the threatened grassland, longleaf pine savanna, sandhill, and scrub landscapes north of Lake Okeechobee, through fee title acquisition and permanent conservation easements on private lands allowing continued cattle and agricultural production while preventing future commercial, industrial, and residential development.

USFWS concluded its planning efforts and formally established the Everglades Headwaters National Wildlife Refuge and Conservation Area on January 18, 2012, making this the 556th unit of the National Wildlife Refuge System. Currently, USFWS is evaluating priority properties for acquisition, conducting market value appraisals, and preparing for the initial purchases of conservation easement and fee title acquisitions. Two local grassroots groups—the Sportsman's Trust Group, consisting of the leaders of many of the local outdoor recreational groups; and the Northern Everglades Alliance, comprising landowners representing ranching and agricultural interests in the area—developed during the planning of this effort have been instrumental in developing broad-based support. At this time, nutrient reduction benefits have not been assigned to this project. As additional information becomes available, the Department will work to calculate potential benefits.

5.8.3 SFWMD'S REGULATORY NUTRIENT SOURCE CONTROL PROGRAM

SFWMD implements nonpoint nutrient source control programs for agricultural and nonagricultural lands through its Regulatory Nutrient Source Control Program and through the ERP Program in areas for which the Department has delegated authority. Activities described in this section will be consistent with changes in the MOU discussed in the introductory paragraph for Chapter 5. The SFWMD will initiate rulemaking for a revised Chapter 40E-61, F.A.C., which will incorporate objectives consistent with the BMAP.

The ERP Program requires that permittees provide reasonable assurance that new activities will not "adversely affect the quality of receiving waters such that state water quality standards will be violated." The ERP Program requires technology-based solutions and presumes that these solutions will meet the water quality standard. Modeling may be used to demonstrate that the proposed project will meet standards. Typically, water quality monitoring is not required. In the case of the Northern Everglades, where the existing ambient water quality does not meet standards due to phosphorus impairment, an applicant currently must implement mitigation measures, proposed by or acceptable to the applicant, that will cause "net improvement of the water quality in the receiving waters for those parameters that do not meet standards." Additionally, applicants must demonstrate that their activities will not cause "adverse water quality impacts to receiving waters or adjacent lands" or "flooding to on-site or off-site properties" (see Rule 62-330.301, F.A.C.). Approximately 45% of the LOW is covered by ERPs, which incorporate water quality and quantity criteria in effect at the time of issuance.

Not all activities are required to obtain ERPs. For example, certain agricultural activities may be exempt pursuant to Section 373.406, F.S. Other exemptions are set forth in Subsections 373.4145(3) and 403.813(1), F.S., and Rule 62-330.051, F.A.C. Most lands used for improved pasture, which is approximately 20% of the LOW, have ERP exemptions. For permitted systems, the water quality design criteria may differ depending on when the stormwater management system was permitted; older stormwater system design criteria may be less stringent. However, implementation of nonagricultural and agricultural BMPs are required to ensure water resource protection in these situations.

Under the BMAP, these programs will continue to complement each other in working toward optimal source control by addressing water quality issues through both regulatory and nonregulatory options, as applicable.

5.9 OTHER RESTORATION STRATEGIES

5.9.1 CERP PROJECTS

CERP provides a framework and guide to restore, protect, and preserve the water resources of central and southern Florida, including the Everglades. The USACE is the Federal Partner, and the SFWMD is the Local Sponsor. The LOW project, a component of CERP, has the objectives of providing better management of lake water levels, reducing damaging discharges to downstream estuaries, restoring isolated wetlands, and resolving water resource problems in Lake Okeechobee. Reservoirs, STAs, wetland restoration, and a modified Lake Istokpoga regulation schedule were anticipated components. The LOWCP-P2TP relied heavily on the LOW project for achieving the plan goals of maintaining Lake

Okeechobee within an ecologically desirable range and minimizing damaging discharges to the Northern Estuaries.

The project delivery team presented a tentatively selected plan to the USACE in February 2007. However, the project formulation phase was subsequently put on hold due to water quality cost-sharing policy challenges. To date, these challenges have not been resolved. Moreover, an increased understanding of the appropriate location and distribution of regional storage within the LOW gained through other subsequent initiatives may warrant the reformulation of the 2007 draft tentatively selected plan. Large regional-scale projects to store excess water, which carries a high nutrient load, will be needed to improve the quantity, distribution, timing, and quality of water reaching Lake Okeechobee. Therefore, the SFWMD is considering reinitiating the formulation of the storage components of the LOW project within the next several years; however, this requires concurrence from the USACE. The first steps of this process will be to approach the Federal Partner on initiating reformulation and to assess the impacts on the overall CERP Integrated Delivery Schedule (IDS).

The SFWMD will initiate these discussions and assessments within two years of Lake Okeechobee BMAP adoption. If the USACE is amenable and impacts to the IDS and cost-share crediting are acceptable to the partners, the SFWMD anticipates reinitiating formulation within the first five years of the Lake Okeechobee BMAP. In the past, plan formulation has ranged from six to eight years; however, the USACE has streamlined its planning processes and is working to complete these types of planning efforts within a three-year time frame. It is anticipated that the plan reformulation will be substantially complete within the first ten-year BMAP implementation phase.

5.9.2 ROLLING MEADOWS PHASE II

The purpose of this project is to restore historic Lake Hatchineha floodplain wetlands and habitat within the Rolling Meadows property, which was purchased jointly by the SFWMD and the Department as part of the Kissimmee Headwaters Revitalization Project. The project will also provide ancillary water quality, timing, and distribution benefits. Phase I of the project will restore approximately 1,970 acres of previously drained floodplain marsh in Parcel B, and construction will be completed within the first phase of the Lake Okeechobee BMAP. Phase II involves the restoration of approximately 580 acres of wetlands in Parcel A, which is approximately 3,800 acres. The load reductions from these restoration projects were estimated based on the estimated net storage benefit and the measured concentration values, if available, and the sub-watershed attenuation factor was applied. **Table 23** shows a schedule for the activities associated with the implementation of this project.

TABLE 23: SCHEDULE FOR ROLLING MEADOWS PHASE II

ACTION	TIME FRAME
Conduct planning activities.	Two Years
Conduct design and permitting work.	Two Years
Construct project.	Nine Months

5.9.3 LAKE OKEECHOBEE LOW WATER LEVEL HABITAT ENHANCEMENT PLAN DEVELOPMENT

Drought conditions in south Florida produce low water levels in Lake Okeechobee that provide opportunities to conduct habitat enhancement projects within littoral marshes. During droughts in 2001, 2007, and 2008, the SFWMD carried out varied habitat enhancement projects, several in conjunction with other state agencies. The primary focus of these projects was to increase the coverage of native aquatic vegetation that provides habitat for fish and wildlife and also naturally sequesters nutrients entering the lake. Increasing native aquatic plant coverage was accomplished directly through planting bulrush and submerged aquatic vegetation within the marsh and pond apple and cypress trees on several of the larger natural islands. Other projects were carried out to create conditions favoring the growth of native aquatic vegetation. These included reducing invasive exotic vegetation coverage through herbicide application and burning, although controlled burns were performed only subsequent to the initiation of natural fires to limit their extent, and reducing the extent of organic material that accumulated during periods of higher, stabilized water levels.

Accumulated organic material was reduced using two methods. The first method was the physical scraping of accumulated organics down to the historical sand substrate. While this method effectively removes the organics and their accompanying nutrient load from the marsh, it is the most costly of all habitat enhancement projects due to the need to haul away scraped materials to suitable disposal sites. The second method employed disking/plowing that inverted the top eight to ten inches of soil so that the underlying natural sand was brought to the surface, covering the accumulated organics. The efficacy of these projects was evaluated through post-project monitoring and showed varied results.

The time available to develop and initiate the projects during the 2007–08 drought was abbreviated because a formal low water level habitat enhancement project plan was not in place. Over the next year, the SFWMD intends to develop such a plan to identify projects to enhance the condition of aquatic habitat based on current marsh habitat conditions and needs. The plan will include project descriptions and methods, target areas, potential project partners, estimated costs, and identification of requisite permits. Information on the feasibility of previously performed projects will be used to guide the development of

new efforts. This planning approach will allow the incorporation of lessons learned to the development of new projects in an effort to maximize project benefits. The project concept will be kicked off through presentations to the Water Resources Advisory Committee and Governing Board in the fall of 2014, and will incorporate appropriate guidance provided. A formal draft plan is anticipated to be completed by the onset of the 2015 dry season.

5.10 SUMMARY OF PROJECT REDUCTIONS

Table 24 summarizes the TP reductions from the projects described above in **Section 5.9**. As described in **Section 4.2.2**, attenuation factors were applied to reflect the physical and chemical processes that occur with phosphorus as water travels to Lake Okeechobee. Without these factors, the benefits of management actions to the lake itself and the TMDL may be overestimated. However, within the individual sub-watersheds, particularly Upper Kissimmee and Lake Istokpoga, the management actions have important benefits that are not fully reflected in the attenuated reduction estimates to the lake. The full nutrient reduction benefits to local waters may be greater than at the inflow to Lake Okeechobee. For those projects completed since January 1, 2009, and planned during the first BMAP iteration, the estimated TP reduction is 103.46 MT/yr. The project nutrient reduction benefits were calculated using the WAM load estimation tool. In addition, the Coordinating Agencies have several projects under development, summarized in **Table 22**. The total estimated reductions and progress towards the TMDL from completed, ongoing, planned, and in development projects are shown in **Table 25**.

TABLE 24: SUMMARY OF TP LOAD REDUCTIONS BY MANAGEMENT STRATEGY TYPE

N/A = Not applicable
Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

SUB-WATERSHED	STRUCTURAL STORMWATER (MT/YR)	STORMWATER REUSE (MT/YR)	STREET SWEEPING (MT/YR)	PUBLIC EDUCATION (MT/YR)	DWM (MT/YR)	STA (MT/YR)	HYDROLOGIC RESTORATION (MT/YR)	AGRICULTURAL BMPS (MT/YR)	COST-SHARE BMPS (MT/YR)	HWTT/ FAVT (MT/YR)	TOTAL LOAD REDUCTION (MT/YR)	TOTAL LOAD REDUCTION (KG/YR)
Fisheating Creek	N/A	N/A	N/A	0.04	4.04	N/A	N/A	5.98	0.27	8.59	18.92	18,932
Indian Prairie	N/A	N/A	N/A	0.07	5.25	0.7	N/A	5.5	0.28	N/A	11.81	11,798
Lake Istokpoga	0.01	N/A	0.06	0.19	0.09	N/A	N/A	1.43	0.05	N/A	1.82	1,821
Lower Kissimmee	N/A	N/A	N/A	0.16	0.56	N/A	17.75	4.5	0.32	N/A	23.29	23,289
Taylor Creek/ Nubbin Slough	0.05	N/A	0.06	N/A	0.21	21.97	N/A	10.33	0.64	7.57	40.83	40,836
Upper Kissimmee	0.25	0.55	0.27	1.24	0.03	N/A	0.89	3.51	0.03	N/A	6.79	6,765
Grand Total	**0.31**	**0.55**	**0.39**	**1.71**	**10.18**	**22.67**	**18.65**	**31.24**	**1.58**	**16.17**	**103.46**	**103,441**

TABLE 25: SUMMARY OF ESTIMATED REDUCTIONS

*The existing load is the long-term average as calculated with the WAM load estimation tool. This is calculated using information only for the six northern sub-watersheds, although the TMDL applies to all nine sub-watersheds. The existing load will be updated to include all sub-watersheds once the WAM updates are complete.
**The 105 MT/yr applies to all of the sub-watersheds and is not an allocation to any collection of sub-watersheds.
Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

CATEGORY	TP REDUCTION (MT/YR)
Existing Load*	448.3
Reductions Needed To Achieve TMDL (105 MT/yr)**	343.3
Total Reductions Achieved (Table 24)	100.0
Projects Under Development with Coordinating Agencies (Table 22)	45.81-48.13
Total Reductions (Table 22 and Table 24)	145.81-148.13 (42.5%-43.1%)
Total Reductions Remaining To Meet TMDL	195.17-197.49

5.11 MANAGEMENT STRATEGIES FOR SOUTHERN SUB-WATERSHEDS

Although this phase of the BMAP focuses on the northern sub-watersheds, the three southern sub-watersheds are included in the BMAP. The three southern sub-watersheds contribute a comparatively smaller percentage of overall loadings to Lake Okeechobee. Flow from these sub-watersheds into the lake is largely diverted in directions other than towards the lake. The three southern sub-watersheds have implemented BMPs either as part of the SFWMD's Chapter 40E-63, F.A.C., or as part of the FDACS BMP Program. In addition, other management strategies have been implemented and will continue under this BMAP. The nutrient reduction benefits associated with them will be further evaluated and calculated by the Department once the WAM is refined to include the three southern sub-watersheds in the future phases of BMAP implementation consistent with Paragraph 403.067(7)(a)(1), F.S.

The three southern sub-watersheds are predominantly agricultural, with urbanized areas along the southern, eastern, and southwestern shore of Lake Okeechobee, and they include scattered homesites and commercial enterprises. While the SFWMD and USACE are responsible for the primary network of canals, levees, and pump stations, special districts manage stormwater runoff, ground water levels, and irrigation withdrawals through parts of the area. This includes flood control for the rural communities of Belle Glade, Pahokee, South Bay, Lake Harbor, Canal Point, Harlem, Clewiston, Moore Haven, and Indiantown. The following special districts are also included:

- Barron WCD.
- Bolles Drainage District.
- Central County WCD.
- Clewiston Drainage District.
- Collins Slough WCD.
- Devils Garden WCD.
- Disston Island Conservancy District.
- East Beach WCD.
- East Hendy County Drainage District.
- East Shore WCD.
- Flaghole Drainage District.

- Gerber Groves WCD.
- Gladeview Drainage District.
- Hendry Hilliard WCD.
- Highlands Glades Drainage District.
- Hobe St. Lucie Conservancy District.
- Northern Palm Beach County Improvement District.
- Okeechobee Utility Authority.
- Pahokee Drainage District.
- Pal Mar WCD.
- Pelican Lake WCD.
- Ritta Drainage District.
- South Florida Conservancy District.
- South Shore Drainage District.
- Sugarland Drainage District.
- Troup-Indiantown WCD.

As part of Phase II of the BMAP, pursuant to Subparagraph 403.067(7)(a)2, F.S., the BMAP will take into account the benefits of pollutant load reduction achieved by the three southern sub-watersheds, which implemented management strategies to reduce pollutant loads, including the diversions discussed in **Section 5.11.4**, and BMPs before the development of the BMAP.

5.11.1 URBAN STORMWATER

The cities of Clewiston, Belle Glade, South Bay, and Pahokee and the counties of Hendry and Palm Beach (and other entities such as FDOT and the Northern Palm Beach County Improvement District) participate in the Department's NPDES MS4 Stormwater Program, and these existing programs will continue. In future BMAP iterations, additional projects may be required of MS4s in the southern sub-watersheds, and the Department will work with the stakeholders to identify completed and future projects.

5.11.2 AGRICULTURAL BMPS

Agricultural BMPs are effective in the reduction of nutrients. In this first BMAP phase, enrollment of agricultural BMPs will be documented through participation in the SFWMD's Chapter 40E-63, F.A.C,. or the FDACS BMPs. Lands enrolled in the BMPs are identified in **Figure 5**. All agricultural lands are required to participate in the FDACS BMP program or monitor for compliance with state water quality standards.

5.11.3 PUBLIC EDUCATION AND OUTREACH

There are public education and outreach programs implemented by and for the growers and producers within the southern sub-watersheds. The Everglades Agricultural Area Environmental Protection District (EAAEPD) is an independent special district and political subdivision of the state of Florida, created pursuant to Chapter 89-423, Laws of Florida, and now existing and authorized by Chapter 2002-378. The EAAEPD, in cooperation with UF–IFAS, special districts, and the SFWMD, provide producer-specific educational programs within the southern district for the implementation of agricultural BMPs. Additional educational programs and nutrient reduction benefits will be listed as part of the next phase of the BMAP.

5.11.4 DIVERSIONS

Chapter 373, F.S., also required the construction of projects, known as the Diversion Projects, which diverted loads away from Lake Okeechobee. The majority of those loads are redirected south for treatment in Everglades STAs prior to discharging to the Everglades Protection Area. These projects were completed and have resulted in substantially reduced TP loads to the lake from those areas.

5.11.5 SEDIMENT REMOVAL/CANAL CLEANING

A systematic canal cleaning program, which is above and beyond the permit requirements of Chapter 40E-63, F.A.C., has been implemented within the special districts adjacent to the lake. It is anticipated that through the lifetime of this BMAP, the key secondary canals will be cleaned on a rotating basis through interagency agreements with select special districts. The program began with a cost-share pilot project with the SFWMD. The pilot program includes monitoring to document the associated reductions. The Department will work with these stakeholders and the SFWMD to determine nutrient reduction benefits for future work.

5.11.6 BOLLES CROSS CANAL IMPROVEMENTS

As part of the efforts to better manage water within the EAA to maximize the effectiveness of the Everglades STAs, landowners in the southern sub-watersheds are participating in a public-private partnership to improve the conveyance capacity of the Bolles Cross Canal. This conveyance will result

in opportunities to convey water to the east and west. The Department will work with these stakeholders and the SFWMD to determine nutrient reduction benefits for these activities.

Chapter 6: ASSESSING PROGRESS AND MAKING CHANGES

Successful BMAP implementation requires commitment and follow-up. Stakeholders have committed to and are required to implement the assigned projects and activities within the first phase of this BMAP. An assessment will be conducted every five years to determine whether there is reasonable progress in achieving pollutant load reductions. This chapter contains the water quality monitoring component sufficient to make this evaluation.

6.1 TRACKING IMPLEMENTATION

The Department will work with the stakeholders to track project implementation. In addition, the Department, SFWMD, and stakeholders will organize the monitoring data collected each year, and it will be made available to the public. The stakeholders will meet annually after the adoption of the BMAP to follow up on plan implementation, share new information, and continue to coordinate on TMDL-related issues. The following types of activities may occur at annual meetings:

- Implementation Data and Reporting –
  - Collect project/BMP implementation information from the stakeholders and MS4 permit reporting and compare with the BMAP schedule. The stakeholders' project tables will be sent out for updates as part of the annual report process.
  - Discuss the data collection process, including any concerns and possible improvements to the process.
  - Review the monitoring plan implementation, as detailed in **Section 6.3**.
- Sharing New Information –
  - Report on results from water quality monitoring and trend information.
  - Provide updates on new projects and programs in the watershed that will help reduce nutrient loading.
  - Identify and review new scientific developments in addressing nutrient loads, provide an update on the status of the lake, and incorporate any new information into annual progress reports.

- Coordinating TMDL-Related Issues –
  - Provide updates from the Department on the basin cycle and activities related to any impairments, TMDLs, and BMAP.
  - Obtain reports from other basins or other sub-watersheds where tools or other information may be applicable to the Lake Okeechobee TMDL.

Covering all of these topics is not required for the annual meetings, but this list provides examples of the types of information that should be considered for the agenda to assist with BMAP implementation and improve coordination among the agencies and stakeholders.

6.2 ADAPTIVE MANAGEMENT MEASURES

Adaptive management involves setting up a mechanism for making adjustments in the BMAP when circumstances change or feedback indicates the need for a more effective strategy. Adaptive management measures include the following:

- Procedures to determine whether additional cooperative strategies are needed.
- Criteria/processes for determining whether and when plan components need revision due to changes in costs, environmental impacts, social effects, watershed conditions, or other factors.

Adaptive management is key to the success of the BMAP and to achieving the TMDL. Adaptive management involves incorporating new information and refining projects and activities to achieve the TMDL. BMAP execution will be a long-term process. Some projects will extend beyond the first phase of the BMAP cycle. The Department and the stakeholders will track implementation efforts and monitor water quality to measure effectiveness and ensure BMAP compliance. This methodology will be determined during the first year after BMAP adoption in coordination with the stakeholders. The stakeholders will meet at least every 12 months to discuss implementation issues, consider new information, and, if the watershed is not projected to meet the TMDL, determine additional corrective actions. Project implementation as well as program and activity status will be collected annually and compiled into an annual progress report from the participating entities. The stakeholders will review these reports to assess progress towards meeting the BMAP's goals.

6.3 WATER QUALITY MONITORING PLAN

6.3.1 MONITORING OBJECTIVES

Focused objectives are critical for a monitoring strategy to provide the information needed to evaluate implementation success. The primary and secondary objectives of the monitoring strategy for the LOW is described below, and will be used to evaluate the success of the BMAP:

- Primary Objective:
  - To continue to track trends in TP loads and concentrations by sub-watershed.
- Secondary Objectives:
  - To continue to track trends in TN loads and concentrations by sub-watershed.
  - To continue to identify areas within the watershed with elevated TP loading to better focus management efforts.
  - To continue to measure effectiveness of individual or collective projects in reaching TMDL target-pollutant loadings.

6.3.2 MONITORING PARAMETERS, FREQUENCY, AND NETWORK

To achieve the objective above, the monitoring strategy focuses on the following suggested parameters:

- TP.
- Orthophosphate as Phosphorus.
- Nitrate/Nitrite as Nitrogen.
- Nitrogen, Ammonia.
- Total Kjeldahl Nitrogen.
- Dissolved Oxygen.
- Chlorophyll-a.
- pH.
- Temperature.
- Specific Conductance.
- Total Suspended Solids.

- Turbidity.
- Alkalinity.
- Biochemical Oxygen Demand.
- Color.

These parameters will be monitored at the sites listed in **Table 26**. However, it should be noted that not all parameters are measured at each of the sites. The monitoring network for this plan builds on existing efforts in the basin by the following entities:

- Osceola County.
- Orange County.
- City of Kissimmee.
- City of Orlando.
- SFWMD.
- U.S. Geological Survey (USGS).

The stations included in the BMAP monitoring network are listed in **Table 26**. These stations are not specifically BMAP stations—*i.e.*, they are designed for other purposes—but the data collected at these sites will be used to monitor the effectiveness of the BMAP. The water quality monitoring will be conducted in accordance with the frequencies below. The stations in the monitoring network are also shown in **Figure 6**.

TABLE 26: BMAP MONITORING NETWORK

- = Empty cell/no data
ACF = Autosampler flow-corrected
ACT = Autosampler composite time proportional

SAMPLING ENTITY	STATION NAME	FREQUENCY	YEAR SITE ESTABLISHED	SUB-WATERSHED
City of Orlando	Buck Lake	Quarterly	1994	Upper Kissimmee
City of Orlando	Lake Fran	Quarterly	1999	Upper Kissimmee
City of Orlando	Lake Mare Prairie	Quarterly	1990	Upper Kissimmee
City of Orlando	Mud Lake	Quarterly	1994	Upper Kissimmee
City of Orlando	Turkey Lake (North)	Quarterly	1985	Upper Kissimmee
City of Orlando	Turkey Lake (South)	Quarterly	1985	Upper Kissimmee
Kissimmee	Bass Slough Lakeside Estates	Quarterly	2007	Upper Kissimmee
Kissimmee	Bass Slough Outfall	Quarterly	2007	Upper Kissimmee
Kissimmee	Mill Slough Mill Run	Quarterly	2007	Upper Kissimmee
Kissimmee	Mill Slough Outfall	Quarterly	2007	Upper Kissimmee
Kissimmee	Outfall Airport and West City Ditch	Quarterly	2007	Upper Kissimmee
Kissimmee	Shingle Creek North of US 192	Quarterly	2007	Upper Kissimmee
Kissimmee	Shingle Creek Outfall	Quarterly	2007	Upper Kissimmee
Kissimmee	Shingle Creek Town Center Blvd	Quarterly	2007	Upper Kissimmee
Orange County	Boggy Creek A (Tradeport Drive)	Quarterly	1982	Upper Kissimmee
Orange County	S-62	Quarterly	2011	Upper Kissimmee
Orange County	Shingle Creek C (Central Florida Pkwy)	Quarterly	1972	Upper Kissimmee
Orlando/Orange County	Boggy Creek	Biannually (winter and summer)	1999	Upper Kissimmee
Orlando/Orange County	Shingle Creek	Biannually (winter and summer)	1999	Upper Kissimmee
Osceola County	ET 05253114	Monthly, if flowing	2011	Upper Kissimmee
Osceola County	JUDGES_DCH	Monthly, if flowing	2011	Upper Kissimmee
Osceola County	PARTIN_CNL	Monthly, if flowing	2011	Upper Kissimmee
Osceola County	RUNNYMEDE	Monthly, if flowing	2011	Upper Kissimmee
SFWMD	2270500	Weekly- ACF	2005	Lake Istokpoga
SFWMD	2273198	Weekly- ACF	2005	Lake Istokpoga
SFWMD	2273198	Weekly –ACF	2005	Lake Istokpoga
SFWMD	A03	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD	ABOGGN	Monthly	1981	Upper Kissimmee
SFWMD	B02	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD	B06	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD	B09	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD	BNSHINGLE	Monthly	1981	Upper Kissimmee
SFWMD	C03	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD	C38W	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	C41H78	Weekly-ACT/Biweekly, if flowing/Monthly/Quarterly	2008	Indian Prairie

SAMPLING ENTITY	STATION NAME	FREQUENCY	YEAR SITE ESTABLISHED	SUB-WATERSHED
SFWMD	CL06283111	Biweekly, if flowing	2006	Upper Kissimmee
SFWMD	CREEDYBR	Monthly	1981	Upper Kissimmee
SFWMD	CULV10A	Biweekly, if flowing/Monthly/ Quarterly	1973	East Lake Okeechobee
SFWMD	CULV5	Biweekly, if flowing/Monthly/ Quarterly	1973	Fisheating Creek
SFWMD	CULV5A	Biweekly, if flowing/Monthly/ Quarterly	1973	West Lake Okeechobee
SFWMD	D02	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD	E02	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD	ET05253114	Biweekly, if flowing	2006	Upper Kissimmee
SFWMD	FECSR78	Biweekly, if flowing/Monthly/ Quarterly	1973	Fisheating Creek
SFWMD	INDUSCAN	Biweekly, if flowing/Monthly/ Quarterly	1973	South Lake Okeechobee
SFWMD	IOC	Weekly Recorded Flow ACF/ Biweekly grabs	2012	Within Lake
SFWMD	ISTK6	Bimonthly (6 times/yr)	1998	Lake Istokpoga
SFWMD	KISSR0.0	Monthly	1986	Within Lake
SFWMD	KREA 30A	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	KREA 98	Monthly	1997	Lower Kissimmee
SFWMD	L001	Monthly	1986	Within Lake
SFWMD	L004	Monthly	1986	Within Lake
SFWMD	L006	Monthly	1986	Within Lake
SFWMD	L008	Monthly	1986	Within Lake
SFWMD	L59E	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	L59W	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	L60E	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	L60W	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	L61E	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	L61W	-	-	Indian Prairie
SFWMD	LI02362923	Biweekly, if flowing	2011	Lake Istokpoga
SFWMD	LZ25A	Monthly	1981	Within Lake
SFWMD	LZ30	Monthly	1986	Within Lake
SFWMD	MBOXSOU	Monthly – Stage dependent	1996	Within Lake
SFWMD	POLE3S	Monthly	1986	Within Lake
SFWMD	S127	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	S129	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	S131	Biweekly, if flowing/Monthly/ Quarterly	1973	Indian Prairie
SFWMD	S133	Biweekly, if flowing/Monthly/ Quarterly	1973	Taylor Creek/ Nubbin Slough
SFWMD	S135	Biweekly, if flowing/Monthly/ Quarterly	1973	Taylor Creek/ Nubbin Slough

SAMPLING ENTITY	STATION NAME	FREQUENCY	YEAR SITE ESTABLISHED	SUB-WATERSHED
SFWMD	S154	Weekly-ACT/Biweekly, if flowing/Monthly/Quarterly	1973	Taylor Creek/ Nubbin Slough
SFWMD	S154C	Biweekly, if flowing/Monthly	1973	Taylor Creek/ Nubbin Slough
SFWMD	S169	Biweekly, if flowing/Monthly/ Quarterly	1973	South Lake Okeechobee
SFWMD	S191	Weekly-ACT/Biweekly, if flowing/Monthly/Quarterly	1973	Taylor Creek/Nubbin Slough
SFWMD	S2	Weekly-ACT/Biweekly, if flowing/Monthly/Quarterly	1973	South Lake Okeechobee
SFWMD	S236	Biweekly, if flowing/Monthly/ Quarterly	1979	South Lake Okeechobee
SFWMD	S3	Weekly-ACT/Biweekly, if flowing/Monthly/Quarterly	1981	South Lake Okeechobee
SFWMD	S308C	Biweekly, if flowing/Monthly/ Quarterly	1973	East Lake Okeechobee
SFWMD	S351	Weekly-ACF	2000	South Lake Okeechobee
SFWMD	S352	Weekly-ACT/ Biweekly, if flowing / Monthly/ Quarterly	2000	South Lake Okeechobee
SFWMD	S354	Weekly – ACF	2000	South Lake Okeechobee
SFWMD	S390	Weekly Recorded Flow ACF/ Biweekly grabs	2006	Taylor Creek/ Nubbin Slough
SFWMD	S392	Weekly Recorded Flow ACF/ Biweekly grabs	2006	Taylor Creek/ Nubbin Slough
SFWMD	S4	Biweekly, if flowing/Monthly/ Quarterly	1973	South Lake Okeechobee
SFWMD	S65	Weekly-ACT/Biweekly/ Quarterly grabs	1973	Upper Kissimmee
SFWMD	S650	Weekly Recorded Flow ACF/ Biweekly grabs	2012	Taylor Creek/ Nubbin Slough
SFWMD	S65A	Weekly-ACT/Biweekly/ Quarterly grabs	1973	Lower Kissimmee
SFWMD	S65E	Weekly-ACT/Biweekly/ Quarterly grabs	1973	Lower Kissimmee
SFWMD	S71	Weekly-ACT/Biweekly, if flowing/Monthly	1973	Indian Prairie
SFWMD	S72	Weekly-ACT/Biweekly, if flowing/Monthly	2007	Indian Prairie
SFWMD	S77	Biweekly, if flowing/Monthly	2007	Within Lake
SFWMD	S84	Biweekly, if flowing/Monthly	2007	Indian Prairie
SFWMD	TCNS 201	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 204	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 207	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 209	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 213	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 214	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 220	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 222	Biweekly, if flowing	1988	Taylor Creek/

SAMPLING ENTITY	STATION NAME	FREQUENCY	YEAR SITE ESTABLISHED	SUB-WATERSHED
				Nubbin Slough
SFWMD	TCNS 228	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 230	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	TCNS 249	Biweekly, if flowing	1988	Taylor Creek/ Nubbin Slough
SFWMD	BS-59	Monthly	1981	Upper Kissimmee
SFWMD/USGS	2255600	Biweekly, if flowing	2005	Fisheating Creek
SFWMD/USGS	2256500	Biweekly, if flowing	2005	Fisheating Creek
SFWMD/USGS	2272676	Biweekly, if flowing	2005	Upper Kissimmee
SFWMD/USGS	2273230	Biweekly, if flowing	2005	Indian Prairie
SFWMD/USGS	2275197	Biweekly, if flowing	2005	Taylor Creek/ Nubbin Slough
SFWMD/USGS	E04	Bimonthly (6 times/yr)	1981	Upper Kissimmee
SFWMD/USGS	KREA 01	Biweekly, if flowing	1986	Upper Kissimmee
USGS	227650	Continuous	-	Lower Kissimmee
USGS	2273230	Continuous	-	Indian Prairie
USGS	2273630	Continuous	-	Taylor Creek/ Nubbin Slough
USGS	2274005	Continuous	-	Taylor Creek/ Nubbin Slough
USGS	2274010	Continuous	-	Taylor Creek/ Nubbin Slough
USGS	2274325	Continuous	-	Taylor Creek/ Nubbin Slough
USGS	2274490	Continuous	-	Taylor Creek/ Nubbin Slough
USGS	2274505	Continuous	-	Taylor Creek/ Nubbin Slough
USGS	Boggy Creek near Taft	Continuous	1959	Upper Kissimmee
USGS	Shingle Creek at Airport near Kissimmee	Continuous	1958	Upper Kissimmee

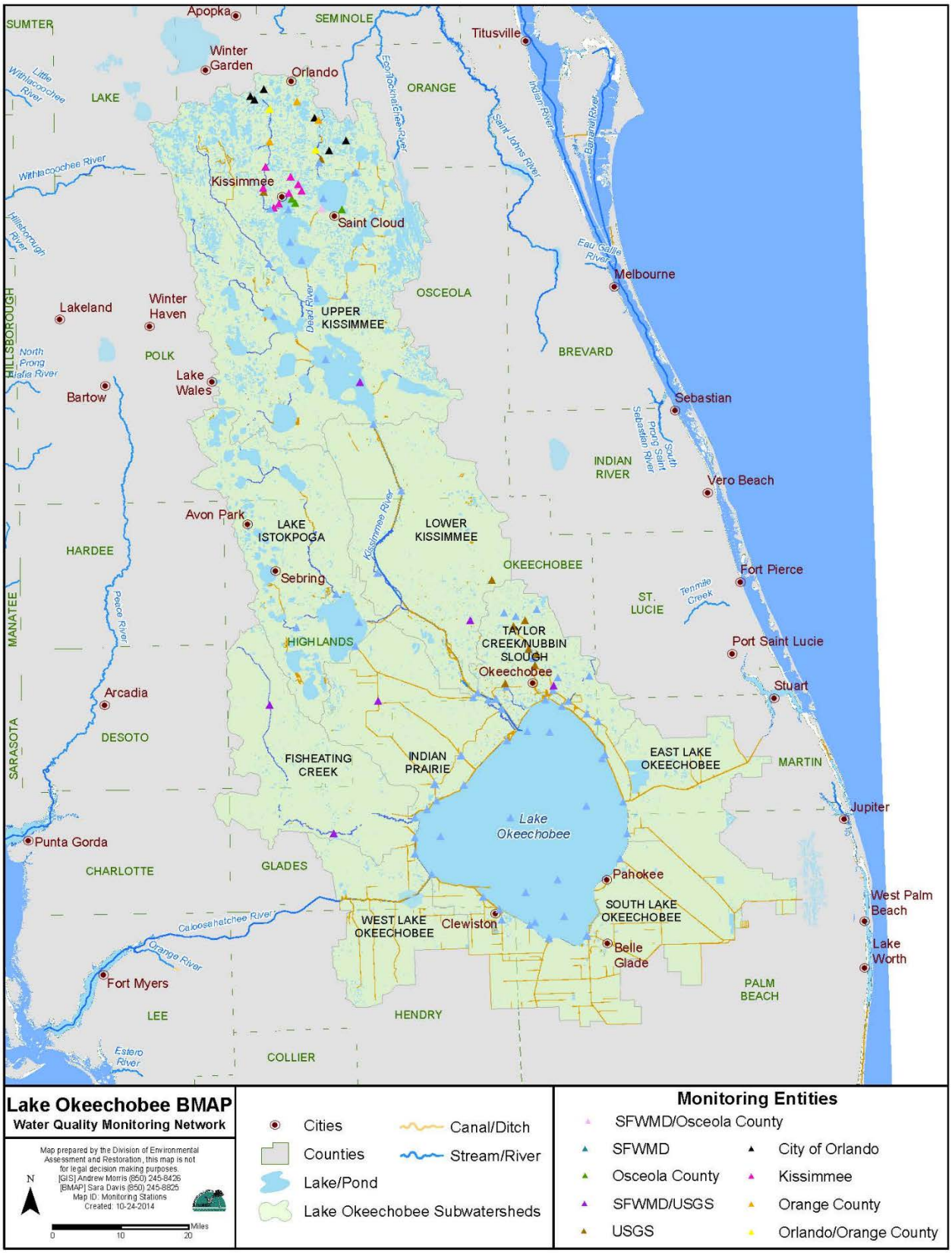

FIGURE 6: WATER QUALITY MONITORING NETWORK FOR THE LAKE OKEECHOBEE WATERSHED

6.3.3 Data Management and Assessment

The Florida Storage and Retrieval (STORET) database serves as the primary repository of ambient water quality data for the state of Florida. The Department's impaired water evaluations and TMDL development are based on water quality data from the STORET database. Ambient water quality data collected as part of the BMAP will be uploaded into STORET for long-term storage and availability. All BMAP data providers will upload ambient water quality data to STORET at least once every six months, upon completion of the appropriate quality assurance/quality control checks. The SFWMD will input its data into STORET at least once per year.

Other data, such as biological and storm event, may also be collected, but the STORET database is not equipped to store these types of data. Stakeholders agree to provide these data to other BMAP partners on request and when appropriate for inclusion in BMAP data analyses and adaptive management evaluations.

The water quality data will be analyzed after each year of BMAP implementation to determine trends in water quality. A wide variety of statistical methods is available for trend analyses. The selection of an appropriate data analysis method depends on the frequency, spatial distribution, and period of record available from existing data. Specific statistical analyses were not identified during BMAP development; however, commonly accepted methods of data analysis will be used that are consistent with the TMDL model.

6.3.4 Quality Assurance/Quality Control

Stakeholders participating in the monitoring plan must collect water quality data in a manner consistent with the current version of the Department's standard operating procedures for quality assurance/quality control. For BMAP-related data analyses, entities should use National Environmental Laboratory Accreditation Conference National Environmental Laboratory Accreditation Program (NELAP)–certified laboratories or other labs that meet the certification and other requirements outlined in the standard operating procedures.

6.3.5 Water Quality Monitoring Plan Reassessment

After BMAP adoption, the Department, in conjunction with the Coordinating Agencies, as well as the stakeholders will refine the monitoring plan to focus on additional areas with existing projects/BMPs to evaluate water quality improvements. The revised WAM output will be used to identify areas where additional monitoring may be necessary. **Table 27** shows the timeline for these activities.

TABLE 27: WATER QUALITY MONITORING PLAN REFINEMENTS

ACTION	TIME FRAME
Identify areas with regional projects already in place.	Complete
Evaluate areas with needs for additional water quality data.	Once WAM completed
Identify lead entity for monitoring efforts.	Spring 2017–Summer 2017
Finalize monitoring plan.	Upon adoption of second-phase BMAP

APPENDICES

APPENDIX A: BMP EFFICIENCIES AND PROJECTS TO ACHIEVE THE TMDL

The BMP efficiencies used in the BMAP nutrient reduction benefit calculations are summarized below in two tables: (1) standard stormwater BMPs, and (2) provisional stormwater BMPs. The standard stormwater BMPs are those that have sufficient, Florida-specific data available to estimate the nutrient removal efficiencies. The provisional stormwater BMPs are those in which further studies are under way or are needed to gather Florida-specific data to better refine the nutrient removal efficiencies. The efficiencies assigned to the provisional stormwater BMPs may be revised based on newer data for future iterations of the BMAP.

The tables below set forth the required projects and time frames for implementation in this BMAP. Agricultural nonpoint source dischargers must either implement the proper FDACS-adopted BMPs or conduct water quality monitoring prescribed by the Department or a water management district that demonstrates compliance with water quality standards. Additional reductions may be necessary in future BMAP updates to meet the TMDL. The tables provide information on the attenuated nutrient reductions attributed to each individual project, shown in MT/yr and kg/yr. Responsible entities submitted these projects and activities to the Department with the understanding that the projects and activities would be included in the BMAP, thus setting the expectation of each entity to implement the proposed projects and activities to achieve the assigned load reduction estimates in the specified time frames. Any change in listed projects and activities, or the deadline to complete these actions, must first be approved by the Department. Substituted projects must result in equivalent or greater nutrient reductions than expected from the original projects.

TABLE A-1: EFFICIENCIES FOR STANDARD STORMWATER BMPS

N/A = Not applicable
[1] Available at http://www.dep.state.fl.us/water/nonpoint/docs/nonpoint/SW_TreatmentReportFinal_71907.pdf.
[2] Available at http://publicfiles.dep.state.fl.us/dwrm/stormwater/stormwater_rule_development/docs/ah_rule_draft_031710.pdf.

STANDARD BMPS	TP % REDUCTION	TN % REDUCTION	DATA SOURCE
Off-line Retention 0.25" treatment volume	40%	40%	Harper, H., and D. Baker. 2007. Evaluation of Current Stormwater Design Criteria within the State of Florida[1]
Off-line Retention 0.50" treatment volume	62%	62%	Harper and Baker 2007
Off-line Retention 0.75" treatment volume	75%	75%	Harper and Baker 2007
Off-line Retention 1.00" treatment volume	84%	84%	Harper and Baker 2007
On-line Retention 0.25" treatment volume	30%	30%	Harper and Baker 2007
On-line Retention 0.50" treatment volume	52%	52%	Harper and Baker 2007
On-line Retention 0.75" treatment volume	65%	65%	Harper and Baker 2007
On-line Retention 1.00" treatment volume	74%	74%	Harper and Baker 2007
Wet detention ponds	Reduction from Figure 13.2 given project's residence time	Reduction from Figure 13.3 given project's residence time	Figures 13.2 and 13.3 in Draft Stormwater Treatment Applicant's Handbook[2]
BMP treatment trains using a combination of BMPs	Use BMP Treatment Train equation: Efficiency = Eff1 +((1-Eff1)*Eff2)	Use BMP Treatment Train equation: Efficiency = Eff1 +((1-Eff1)*Eff2)	Draft Stormwater Treatment Applicant's Handbook[2]
Dry detention	10%	10%	Harper and Baker 2007.
Baffle box	2.30%	0.50%	Final Report Contract S0236 Effectiveness of Baffle Boxes
Nutrient baffle box (2nd generation)	15.50%	19.05%	Final Report Contract S0236 Effectiveness of Baffle Boxes
Grass swales with swale blocks or raised culverts	Use on-line retention BMPs above	Use on-line retention BMPs above	Evaluation of Harper and Baker data
Grass swales without swale blocks or raised culverts	50% of value for grass swales with swale blocks or raised culverts	50% of value for grass swales with swale blocks or raised culverts	Evaluation of Harper and Baker data
Alum injection	90%	50%	Evaluation of Harper and Baker data
Stormwater reuse	Estimate amount of water not discharged annually because used for irrigation	Estimate amount of water not discharged annually because used for irrigation	Evaluated on case-by-case basis
Stormceptor	13%	2%	Final Report Contract S0095 Sanford Stormceptor project

STANDARD BMPS	TP % REDUCTION	TN % REDUCTION	DATA SOURCE
Continuous Deflective Separation (CDS) units	10%	N/A	Final Report Contract WM793 Broadway Outfall Project
Street sweeping	Determine dry weight/volume of material collected annually and multiply by values provided by FSA UF MS4 BMP project	Determine dry weight/volume of material collected annually and multiply by values to be provided by FSA UF MS4 BMP project	Final Report of FSA UF MS4 BMP Project
Catch basin inserts/inlet filters	Determine dry weight/volume of material collected annually and multiply by values to be provided by FSA UF MS4 BMP project	Determine dry weight/volume of material collected annually and multiply by values to be provided by FSA UF MS4 BMP project	Final Report of FSA UF MS4 BMP Project

TABLE A-2: EFFICIENCIES FOR PROVISIONAL STORMWATER BMPS

N/A = Not applicable

PROVISIONAL BMPS	TP % REDUCTION	TN % REDUCTION	DATA SOURCE
Public education	1% to 6%, depending on extent of program	1% to 6%, depending on extent of program	Evaluation of Center for Watershed Protection. 2002. Watershed Treatment Model Version 3.1. See separate calculation spreadsheet.
Muck removal/ restoration dredging	Case by case depending on nutrient flux of muck	Case by case depending on nutrient flux of muck	Department Muck Removal Credit Guidance (developed for IRL BMAPs)
Aquatic vegetation harvesting	Based on total mass of material collected, type of plant(s), and associated nutrient content in dry material	Based on total mass of material collected, type of plant(s), and associated nutrient content in dry material	Department Removal of Aquatic Vegetation for Nutrient Credits (developed for IRL BMAPs)
Septic tank phase out	N/A	Based on values from ArcNLET model	Available: http://people.sc.fsu.edu/~mye/ArcNLET/index.html
DWM	Based on measured data or ac-ft of storage and land use concentration	Based on measured data or ac-ft of storage and land use concentration	Determined through discussions between the Department and SFWMD
STAs	Based on engineering design calculations	Based on engineering design calculations	SFWMD

TABLE A-3: PROJECTS IN THE FISHEATING CREEK SUB-WATERSHED

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	PROJECT TYPE	DESCRIPTION	ACRES TREATED	COST	ANNUAL O&M COST	FUNDING SOURCES	STATUS	START DATE	COMPLETION DATE	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)	TN REDUCTION (MT/YR)	TN REDUCTION (KG/YR)
GC-1	Education and Outreach	Glades County	Public education	FYN; landscaping, irrigation, and fertilizer ordinances; PSAs, pamphlets, website, and illicit discharge program	N/A	Unknown	Unknown	Glades County	Ongoing	N/A	Ongoing	0.01	13.7	0.08	79.1
FDACS-4	Fisheating Creek	FDACS	Floating aquatic vegetation treatment (FAVT)	Fully aquatic vegetation treatment.	N/A	Unknown	Unknown	FDACS/ SFWMD	In Progress	N/A	Unknown	8.59	8,594.9	29.17	29,174.3
HC-1	Education and Outreach	Highlands County	Public education	FYN, landscaping and irrigation ordinances, PSAs, and pamphlets.	N/A	Unknown	Unknown	High-lands County	Ongoing	N/A	Ongoing	0.03	29.5	0.36	362.3
SFWMD-18	XL Ranch (Lightsey)	SFWMD	DWM	Storage of 887 ac-ft of water through above ground impoundment and pasture.	N/A	$52,415	$130,150	SFWMD	Operational	N/A	Unknown	0.07	70.9	Not quantified	Not quantified
SFWMD-20	Blue Head Ranch	SFWMD	DWM	Storage of 3,462 ac-ft of water through pasture.	N/A	$193,750	$361,200	SFWMD	Design/ Permitting	Unknown	Unknown	0.72	724.2	Not quantified	Not quantified
SFWMD-21	Nicodemus Slough	SFWMD	DWM	Storage of 34,000 ac-ft of water through above ground impoundment and pasture.	N/A	$4,900,000	$2,968,328	SFWMD	Under Construction	Unknown	Unknown	3.25	3,248.5	Not quantified	Not quantified

TABLE A-4: PROJECTS IN THE INDIAN PRAIRIE SUB-WATERSHED

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	PROJECT TYPE	DESCRIPTION	ACRES TREATED	COST	ANNUAL O&M COST	FUNDING SOURCES	STATUS	START DATE	COMPLETION DATE	TP REDUCTION	TP REDUCTION (KG/YR)	TN REDUCTION (MT/YR)	TN REDUCTION (KG/YR)
GC-2	Education and Outreach	Glades County	Public education	FYN; landscaping, irrigation, and fertilizer ordinances; PSAs, pamphlets, website, and illicit discharge program	N/A	Unknown	Unknown	Glades County	Ongoing	N/A	Ongoing	0.04	38.5	0.41	413.9
HC-2	Education and Outreach	Highlands County	Public education	FYN, landscaping and irrigation ordinances, PSAs, and pamphlets.	N/A	Unknown	Unknown	Highlands County	Ongoing	N/A	Ongoing	0.03	29.6	0.42	415.2
IMWID-1	Istokpoga Marsh Watershed Improvement District	Istokpoga Marsh Watershed Improvement District/ Highlands County, SWFWMD, Department, FDACS	STA	Stormwater treatment area.	711	Unknown	Unknown	Unknown	Planned and Funded	Unknown	Unknown	0.70	698.0	Not quantified	Not quantified
SFWMD-10	West Waterhole Marsh	SFWMD	DWM	Storage of 5,000 ac-ft of water through above ground impoundment.	N/A	$50,000	$493,750	FRESP	Operational	N/A	Unknown	4.17	4,166.4	20.62	20,619.5
SFWMD-12	Buck Island Ranch	SFWMD	DWM	Storage of 1,573 ac-ft of water through pasture.	N/A	$1,928	$173,600	SFWMD	Operational	N/A	Unknown	1.09	1,087.2	Not quantified	Not quantified

TABLE A-5: PROJECTS IN THE LAKE ISTOKPOGA SUB-WATERSHED

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	PROJECT TYPE	DESCRIPTION	ACRES TREATED	COST	ANNUAL O&M COST	FUNDING SOURCES	STATUS	START DATE	COMPLETION DATE	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)	TN REDUCTION (MT/YR)	TN REDUCTION (KG/YR)
AP-1	Avon Park Street Sweeping	City of Avon Park	Street sweeping	Street sweeping.	N/A	Unknown	Unknown	City of Avon Park	Ongoing	N/A	Ongoing	0.00	4.5	0.01	11.2
AP-2	Lake Tulane Stormwater Improve-ment Project	City of Avon Park/ SWFWMD	Swales	The runoff will be captured in a series of swales that will allow the runoff to percolate into the sandy soils, preventing further degradation of Lake Tulane.	32.1	Unknown	Unknown	City of Avon Park/ SWFWMD	Envisioned, Not Funded	Unknown	Unknown	0.00	1.7	0.02	16.2
AP-3	Lake Isis Stormwater Improve-ment Project	City of Avon Park/ SWFWMD	Wet detention pond	The runoff will be captured in a lakeside swale and a re-designed pond that will allow the runoff to percolate into the sandy soils, preventing further degradation of Lake Isis.	37.1	Unknown	Unknown	City of Avon Park/ SWFWMD	Envisioned, Not Funded	Unknown	Unknown	0.00	0.5	0.00	4.9
SEB-1	Little Lake Jackson Off-line Alum Injection Stormwater Treatment	City of Sebring/ Highlands County	Alum injection	Stormwater is diverted through underground culvert, alum is injected and the water settles for 7 days in a detention pond. Treated water is released to Little Lake Jackson.	0	$231,494	$18,500	Department 319 grant, SWFWMD, City of Sebring, and Highlands County Board of County Commissioners	Ongoing	N/A	July 2011	Not quan-tified	Not quan-tified	Not quan-tified	Not quan-tified

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/YR)	TP Reduction (KG/YR)	TN Reduction (MT/YR)	TN Reduction (KG/YR)
SEB-2	Street Sweeping	City of Sebring	Street sweeping	Street sweeping to collect 602,940 lbs/yr of material.	N/A	See annual O&M	$35,000	City of Sebring	Ongoing	N/A	Ongoing	0.05	50.9	0.12	118.4
HC-3	Education and Outreach	Highlands County	Public education	FYN, landscaping and irrigation ordinances, PSAs, and pamphlets.	N/A	Unknown	Unknown	Highlands County	Ongoing	N/A	Ongoing	0.16	155.2	6.58	6,580.7
HC-5	Lake June Stormwater Project	Highlands County/ SWFWMD	Online retention	The conceptual plan includes the installation of 450 feet of 24-inch French drain in four contributing basins.	43.3	$440,000	Unknown	SWFWMD and Highlands County	Planned and Funded	Unknown	Unknown	Not quan-tified	Not quan-tified	Not quan-tified	Not quan-tified
HC-6	Lake Clay Stormwater Project	Highlands County/ SWFWMD	Online retention	600 feet of 24-inch on-line French drain for parking lot subbasin; 300 feet of 24-inch on-line French drain will treat the street subbasin.	26.6	$330,000	$1,973	SWFWMD and Highlands County	Completed	N/A	January 2013	0.00	1.3	0.02	24.1
PC-1	Education and Outreach	Polk County	Public education	FYN, fertilizer ordinance, PSAs, pamphlets, website, and illicit discharge inspection program.	N/A	Unknown	Unknown	Polk County	Ongoing	N/A	Ongoing	0.04	38.8	1.09	1,086.9
SFWMD -11	Rafter T Ranch	SFWMD	DWM	Storage of 1,145 ac-ft of water through above ground impoundment and pasture.	N/A	$431,524	$92,490	FRESP	Operational	N/A	Unknown	0.09	89.8	Not quan-tified	Not quan-tified
SLID-1	Spring Lake Improvement District Improve-ments	Spring Lake Improvement District	STA	Treatment of runoff through a stormwater treatment area.	2,308	$4,262,105	Unknown	SLID and Department Section 319 Grant	Planned and Funded	Unknown	Unknown	0.00	4.5	0.03	32.9

TABLE A-6: PROJECTS IN THE LOWER KISSIMMEE SUB-WATERSHED

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	PROJECT TYPE	DESCRIPTION	ACRES TREATED	COST	ANNUAL O&M COST	FUNDING SOURCES	STATUS	START DATE	COMPLETION DATE	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)	TN REDUCTION (MT/YR)	TN REDUCTION (KG/YR)
HC-4	Education and Outreach	Highlands County	Public education	FYN, landscaping and irrigation ordinances, PSAs, and pamphlets.	N/A	Unknown	Unknown	Highlands County	Ongoing	N/A	Ongoing	0.14	136.0	0.54	538.6
OSC-11	Education	Osceola County	Public education	FYN; landscaping, irrigation, fertilizer, and pet waste management ordinances; PSAs; pamphlets; website; and illicit discharge program.	N/A	Unknown	Unknown	Unknown	Ongoing	N/A	Ongoing	0.00	2.5	0.02	24.4
PC-2	Education and Outreach	Polk County	Public education	FYN, fertilizer ordinance, PSAs, pamphlets, website, and illicit discharge inspection program.	N/A	Unknown	Unknown	Polk County	Ongoing	N/A	Ongoing	0.02	22.7	0.41	408.9
SFWMD-4	Otter Slough Restoration	SFWMD	Restoration	Includes five ditch plugs and removal of two berms. It helps attenuate regional stormwater runoff, as well as providing nutrient reductions due to plant uptake from overland flows. In 2011 LOPP, it was estimated to create 71 acre-ft of storage.	N/A	Unknown	Unknown	SFWMD	Completed	N/A	2009	0.01	5.6	Not quan-tified	Not quan-tified

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
SFWMD-5	Kissimmee River Restoration	SFWMD	Restoration	Restore ecological integrity by restoring 40 miles of meandering river and more than 12,000 miles of wetlands through the design and construction of physical project features coupled with application of optimized hydrologic conditions.	26,500	$780,000,000	Unknown	SFWMD and USACE	Under Construc-tion	0	2017-2020	17.75	17,748.0	Not quan-tified	Not quan-tified
SFWMD-13	Dixie West	SFWMD	DWM	Storage of 315 ac-ft of water through pasture.	N/A	$7,228	$51,500	SFWMD	Operational	N/A	Unknown	0.23	230.5	Not quan-tified	Not quan-tified
SFWMD-14	Dixie Ranch	SFWMD	DWM	Storage of 856 ac-ft of water through pasture.	N/A	$17,015	$146,500	SFWMD	Operational	N/A	Unknown	0.13	133.7	Not quan-tified	Not quan-tified
SFWMD-17	Willaway Cattle & Sod	SFWMD	DWM	Storage of 229 ac-ft of water through above ground impoundment.	N/A	$325,494	$1,879	SFWMD	Completed	N/A	Unknown	0.11	114.4	Not quan-tified	Not quan-tified
SFWMD-19	Triple A Ranch	SFWMD	DWM	Storage of 397 ac-ft of water through above ground impoundment.	N/A	$322,186	$28,500	SFWMD	Under Construc-tion	Unknown	Unknown	0.08	78.6	Not quan-tified	Not quan-tified

TABLE A-7: PROJECTS IN THE TAYLOR CREEK/NUBBIN SLOUGH SUB-WATERSHED

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	PROJECT TYPE	DESCRIPTION	ACRES TREATED	COST	ANNUAL O&M COST	FUNDING SOURCES	STATUS	START DATE	COMPLETION DATE	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)	TN REDUCTION (MT/YR)	TN REDUCTION (KG/YR)
FDACS-1	Lemkin Creek	FDACS	Hybrid wetland treatment technol-ogy (HWTT)	HWTT is a combination of wetland and chemical treatment technologies designed mainly to remove phosphorus at the sub-basin and parcel scales.	1,522	Unknown	Unknown	FDACS/ SFWMD	Operational	N/A	2009	0.15	151.6	0.65	652.1
FDACS-2	Wolff Ditch	FDACS	HWTT	HWTT is a combination of wetland and chemical treatment technologies designed mainly to remove phosphorus at the sub-basin and parcel scales.	1,930	Unknown	Unknown	FDACS/ SFWMD	Operational	N/A	2009	0.85	845.5	1.72	1,722.0
FDACS-3	Grassy Island	FDACS	HWTT	HWTT is a combination of wetland and chemical treatment technologies designed mainly to remove phosphorus at the sub-basin and parcel scales.	37,802	Unknown	Unknown	FDACS/ SFWMD	Completed	N/A	2010	5.55	5,547.3	8.37	8,373.1

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDACS-5	Nubbin Slough	FDACS	HWTT	HWTT is a combination of wetland and chemical treatment technologies designed mainly to remove phosphorus at the sub-basin and parcel scales.	N/A	Unknown	Unknown	FDACS/ SFWMD	Completed	N/A	Unknown	0.55	554.6	0.37	370.9
FDACS-6	Mosquito Creek	FDACS	HWTT	HWTT is a combination of wetland and chemical treatment technologies designed mainly to remove phosphorus at the sub-basin and parcel scales.	N/A	Unknown	Unknown	FDACS/ SFWMD	Completed	N/A	Unknown	0.48	475.6	0.60	602.1
FDOT1-1	State Road 70 from 34th Avenue to 80th Avenue	FDOT District 1	Wet detention pond	Six wet detention ponds.	57.40	$22,041,000	Unknown	FDOT	Planned and Funded	April 2014	Unknown	0.02	22.6	0.04	42.6
FDOT1-2	State Road 70 from 80th Avenue to St. Lucie County Line	FDOT District 1	Wet detention pond	Three wet detention ponds and three dry retention swales.	31.40	$8,746,000	Unknown	FDOT	Planned and Funded	April 2014	Unknown	0.02	17.5	0.04	39.4
FDOT1-3	Street Sweeping	FDOT District 1	Street sweeping	Street sweeping.	N/A	Unknown	Unknown	FDOT	Ongoing	N/A	Ongoing	0.06	61.3	0.06	55.3

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OK-1	Douglas Park North	Okee-chobee County	Dry detention and CDS unit	New roadside swales and addition of three vortex separators to the existing swales for water quality improvement.	66.30	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0.00	2.7	0.02	15.2
OK-2	Oak Park	Okee-chobee County	Dry detention and CDS unit	Roadside swales with raised inlets and two vortex separators.	56.40	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0.00	2.2	0.01	14.4
OK-3	South-west 21st Street	Okee-chobee County	Dry detention	Dry detention roadside swales with raised inlets.	2.10	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0.00	0.1	0.00	0.5
OK-4	South-west Drainage Area Improve ments	Okee-chobee County	Baffle box	Installation of sediment control boxes.	32.20	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0.00	0.4	0.00	0.3
OK-5	Okee-chobee County 2008 Disaster Recovery Communi-ty Develop-ment Block Grant	Okee-chobee County	Dry detention	Dry detention area to improve water quality and alleviate flooding.	17.20	Unknown	Unknown	Unknown	Unknown	Unknown	Unknown	0.00	0.2	0.00	4.2
SFWMD-1	Taylor Creek	SFWMD	STA	The Taylor Creek STA is a two-celled STA.	118.00	$26,900,000	$50,000	SFWMD and USACE	Completed	N/A	2009	1.80	1,802.5	Not quan-tified	Not quan-tified

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
SFWMD-2	Nubbin Slough	SFWMD	STA	The Nubbin Slough STA is the larger of the two pilot STAs constructed north of the lake. It is a two-celled enclosure.	773.00	Included in SFWMD-1	$100,000	SFWMD and USACE	Completed, Not Operational	Unknown	Unknown	6.19	6,193.6	Not quan-tified	Not quan-tified
SFWMD-3	Lakeside Ranch Phase I	SFWMD	STA	Phase I included construction of a 1,200-acre STA, canal improvements, and the installation of the S-650 pump station.	N/A	$22,800,000	$341,000	SFWMD	Completed	N/A	2012	13.98	13,978.8	Not quan-tified	Not quan-tified
SFWMD-15	Dixie Ranch	SFWMD	DWM	Storage of 856 ac-ft of water through pasture.	N/A	$17,015	$146,500	SFWMD	Completed	N/A	Unknown	0.21	205.9	Not quan-tified	Not quan-tified

TABLE A-8: PROJECTS IN THE UPPER KISSIMMEE SUB-WATERSHED

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NUMBER	PROJECT NAME	LEAD ENTITY/ PARTNERS	PROJECT TYPE	DESCRIPTION	ACRES TREATED	COST	ANNUAL O&M COST	FUNDING SOURCES	STATUS	START DATE	COMPLETION DATE	TP REDUCTION (MT/YR)	TP REDUCTION (KG/YR)	TN REDUCTION (MT/YR)	TN REDUCTION (KG/YR)
EW-1	Water Quality Awareness Program	City of Edgewood	Public education	Water quality education and awareness articles in the city's quarterly newsletter. Various water quality related informational brochures, fliers and other publications displayed at city hall for the public.	N/A	See annual O&M	$1,000	City of Edgewood	Ongoing	N/A	Ongoing	0.00	0.6	0.02	17.3
KS-1	Education and Outreach	City of Kissimmee	Public education	PSAs, pamphlets, website, and illicit discharge inspection program.	N/A	$65,000	Unknown	City of Kissimmee Stormwater Utility Fund	Ongoing	N/A	Ongoing	0.01	8.3	0.20	199.9
KS-2	Street Sweeping	City of Kissimmee	Street sweeping	Sweeping over 8,500 miles per year. Material is not currently weighed, but city is currently developing a program to weigh material.	N/A	$50,000	Unknown	City of Kissimmee Stormwater Utility Fund	Ongoing	N/A	Ongoing	0.10	100.4	0.28	277.6
KS-3	Lake Tivoli	City of Kissimmee	Wet detention pond	Treatment for older existing development as well as future on-line development; treatment provides 2.5 times the proposed percent impervious area.	132.8	$300,000	Unknown	Unknown	Envisioned, Not Funded	Unknown	Unknown	0.00	0.0	0.00	0.0

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
KS-4	Lakefront Park Redevelop-ment - Swales/ Rain Gardens	City of Kissimmee	Dry detention	Swale/rain garden system with 2.07 acres of dry detention.	14.2	$500,000	Unknown	City of Kissimmee General Fund	Started	2013	2015	0.00	0.2	0.01	5.7
KS-5	Lakefront Park Redevelop-ment - Baffle Boxes	City of Kissimmee	2nd generation baffle box	Three nutrient separating baffle boxes and three filter boxes within the lakefront park area. Intend to install up to and additional two baffle boxes in the next five years.	14.2	$394,267 completed; additional $50,000 for future boxes	Unknown	City of Kissimmee Stormwater Utility Fund	Started	2012	2015	0.00	0.2	0.01	9.8
KS-6	Martin Luther King Boulevard Phase III from Thacker Avenue to Dyer Boulevard	City of Kissimmee	Dry detention	Construction of dry detention with particular standards (side slopes, littoral zones) per the Federal Aviation Administration for reduction of bird strikes.	5.5	$1,500,000	Unknown	City of Kissimmee Stormwater Utility Fund	Started	2013	2015	0.00	0.1	0.00	1.2
ORL-1	18th Street/ Parramore Ave Baffle Box	City of Orlando	2nd generation baffle box	Baffle box installed to remove gross pollutants, including organic debris, sediment and litter.	4.6	$578,138	Unknown	City of Orlando Stormwater Utility + 50% cost funded from SFWMD Grant	Completed	N/A	August 2009	0.00	0.0	0.00	3.3

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
ORL-2	19th Street/ Parramore Avenue Baffle Box	City of Orlando	2nd generation baffle box	Baffle box installed to remove gross pollutants, including organic debris, sediment and litter.	9.9	Part of project ORL-1	Unknown	City of Orlando Stormwater Utility + 50% cost funded from SFWMD Grant	Completed	N/A	August 2009	0.00	0.1	0.01	7.1
ORL-3	Pine Street/ Orange Blossom Trail Corridor Stormwater Improve-ments	City of Orlando	2nd generation baffle box	Installation of 1,800 feet of stormwater pipe from Pine Street to Lake Lorna Doone, which includes a baffle box.	11.5	$577,822	Unknown	City of Orlando Stormwater Utility + 50% cost funded by CBIR Grant	Completed	N/A	May 2010	0.00	0.3	0.00	2.8
ORL-4	Lake Holden Terrace/ Albert Shores Sanitary Compo-nents	City of Orlando	Septic tank phase out	Sanitary infrastructure installed for septic tank conversions. 11 of 77 homes converted.	0	$3,522,911	Unknown	City of Orlando Wastewater Division, City of Orlando Stormwater Utility, Orlando Utility Commis-sion	Completed	N/A	February 2012	0.00	0.0	0.00	0.0
ORL-5	Lake Holden Terrace/Albert Shores Stormwater Compo-nents	City of Orlando	2nd generation baffle box	Two baffle boxes and one Storm Flo unit installed within stormwater infrastructure for capturing organic debris, sediment and litter; stormwater infrastructure added to alleviate flooding.	76.4	Part of ORL-4	Unknown	City of Orlando Wastewater Division, City of Orlando Stormwater Utility, Orlando Utility Commis-sion	Completed	N/A	February 2012	0.00	1.0	0.04	39.3

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
ORL-6	Lake Angel Drainage Improvements	City of Orlando	Wet detention pond	Expand the permanent pool volume of Lake Angel and install three baffle boxes in the main inflow pipes.	94.5	$2,000,000	Unknown	City of Orlando Stormwater Utility + EPA Grant	Planned and Funded	February 2014	December 2014	0.00	0.5	0.02	16.6
ORL-7	Cemex-South Division Avenue Roadway and Drainage Improve-ments	City of Orlando	2nd generation baffle box	Pave unimproved access road to industrial park and install baffle box to capture sediment; install curbing along additional areas of Division Avenue to allow street sweepers to effectively capture more sediment in the Lake Holden basin.	52.6	$1,500,000	Unknown	City of Orlando Stormwater Utility	Planned and Funded	July 2014	April 2015	0.00	1.3	0.01	12.7
ORL-8	Lake Pineloch Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	32 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 27.7 cubic yards/yr of material collected.	N/A	$40,480	$10,444	City of Orlando Stormwater Utility	Ongoing	N/A	Ongoing	0.01	5.8	0.02	17.2
ORL-9	Clear Lake Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	29 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 32.39cubic yards/year of material collected.	N/A	$8,550	$9,400	City of Orlando	Ongoing	N/A	Ongoing	0.01	6.7	0.02	20.2

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
ORL-10	Lake Lorna Doone Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	16 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 31.53 cubic yards/yr of material collected.	N/A	$17,755	$5,222	City of Orlando	Ongoing	N/A	Ongoing	0.01	6.5	0.02	19.6
ORL-11	Lake Mann Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	44 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 53.29 cubic yards/yr of material collected.	N/A	$48,826	$143,616	City of Orlando	Ongoing	N/A	Ongoing	0.01	11.0	0.03	33.2
ORL-12	Lake Rabama Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	16 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 24.5cubic yards/yr of material collected.	N/A	$14,720	$5,222	City of Orlando	Ongoing	N/A	Ongoing	0.01	5.1	0.02	15.2
ORL-13	Rock Lake Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	10 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 20.06 cubic yards/yr of material collected.	N/A	$8,550	$3,264	City of Orlando	Ongoing	N/A	Ongoing	0.00	4.2	0.01	12.5

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
ORL-14	Lake Sunset Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	8 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 36.45 cubic yards/yr of material collected.	N/A	$8,550	$2,611	City of Orlando	Ongoing	N/A	Ongoing	0.01	7.6	0.02	22.7
ORL-15	Walker Lagoon Basin Inlet Baskets	City of Orlando	Catch basin inserts/ inlet filters	16 inlet baskets installed to remove gross pollutants, including organic debris, sediment and litter. 31.9 cubic yards/yr of material collected.	N/A	$17,755	$5,222	City of Orlando	Ongoing	N/A	Ongoing	0.01	6.6	0.02	19.9
ORL-16	Street Sweeping	City of Orlando	Street sweeping	Street sweeping within all public roads in city limits. 2,682,8967 lbs/yr of material collected.	N/A	See annual O&M	$1,800,000	City of Orlando Stormwater Utility	Ongoing	N/A	Ongoing	0.09	89.6	0.26	257.6
ORL-17	Public Education	City of Orlando	Public education	FYN; landscaping, irrigation, and pet waste management ordinances; PSAs; pamphlets; website; and illicit discharge program.	N/A	See annual O&M	$80,000	City of Orlando Stormwater Utility	Ongoing	N/A	Ongoing	0.21	206.7	3.44	3,440.0

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDOT5-1	239266-B State Road 15 (Hoffner Road) From North of Lee Vista Boulevard to West of State Road 436 (Pond 2)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	4.8	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.1	0.00	0.3
FDOT5-2	239266-A State Road 15 Hoffner Ave From West of State Road 436 to Conway Road (Pond 1)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	3.6	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.1	0.00	0.9
FDOT5-3	239266-C State Road 15 Hoffner Avenue From West of State 436 to Conway Road (Pond 3)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	11.9	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.5	0.01	6.7

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDOT5-4	239266-D State Road 15 Hoffner Avenue From West of State Road 436 to Conway Road (Pond 4)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	11.4	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.4	0.01	10.4
FDOT5-5	239535-F State Road 50 From Good Homes Road to Pine Hills Road (Pond 4)	FDOT District 5	Dry retention	Add lanes and reconstruct.	16.4	Unknown	Unknown	Florida Legislative	Completed	Unknown	Unknown	0.00	0.7	0.00	3.9
FDOT5-6	416518-A Interstate-4 Braided Ramp from US 192 Interchange to Osceola Parkway Interchange (Pond SE-1)	FDOT District 5	Wet detention pond	New road construction.	13.8	Unknown	Unknown	Florida Legislative	Completed	Unknown	Unknown	0.00	0.5	0.00	2.3

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDOT5-7	416518-B Interstate-4 Braided Ramp from US 192 Interchange to Osceola Parkway Interchange (Pond SE-2)	FDOT District 5	Wet detention pond	New road construction.	6.1	Unknown	Unknown	Florida Legislative	Completed	Unknown	Unknown	0.00	0.2	0.00	0.7
FDOT5-8	239682-A State Road 500 (US 17-92) From Aeronau-tical Drive to Budinger Avenue (Pond 1)	FDOT District 5	Wet detention pond	Add lanes and rehabilitate pavement.	26.5	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.9	0.01	6.1
FDOT5-9	239682-B State Road 500 (US 17-92) From Aeronautical Drive to Budinger Avenue (Pond 2)	FDOT District 5	Wet detention pond	Add lanes and rehabilitate pavement.	13.4	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.5	0.00	3.5

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDOT5-10	239682-C State Road 500 (US 17-92) From Aeronautical Drive to Budinger Avenue (Pond 3)	FDOT District 5	Wet detention pond	Add lanes and rehabilitate pavement.	15.8	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.6	0.00	3.4
FDOT5-11	239682-D State Road 500 (US 17-92) From Aeronautical Drive to Budinger Avenue (Pond 4)	FDOT District 5	Wet detention pond	Add lanes and rehabilitate pavement.	33.7	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	1.1	0.01	6.7
FDOT5-12	418403-A, B State Road 600 (US 17/92) JYP From South of Portage Street to North of Vine Street (US192) (Ponds East and West)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	14.2	Unknown	Unknown	Florida Legislative	Planned and Funded	Estimated Start – Summer 2015	Unknown	0.00	0.5	0.00	3.4

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDOT5-13	239454-A Widening of SR436 from SR528 to SR552 (Pond A)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	38.8	Unknown	Unknown	Florida Legislative	Completed	N/A	July 2010	0.00	0.3	0.00	0.9
FDOT5-14	239635-A New Bridge State Road 500 at Reedy Creek (Pond 1)	FDOT District 5	Dry retention	New bridge.	4.1	Unknown	Unknown	Florida Legislative	Completed	N/A	July 2010	0.00	0.0	0.00	0.6
FDOT5-15	239635-B New Bridge State Road 500 at Reedy Creek (Pond 2)	FDOT District 5	Wet detention pond	New bridge.	7.6	Unknown	Unknown	Florida Legislative	Completed	N/A	July 2010	0.00	0.2	0.00	3.4
FDOT5-16	239663-A Widening of State Road 530 from State Road 535 to Hoagland Boulevard (Pond 1)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	14.6	Unknown	Unknown	Florida Legislative	Completed	N/A	June 2010	0.00	0.6	0.00	2.1

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDOT5-17	239663-B Widening of State Road 530 from State Road 535 to Hoagland Boulevard (Pond 2)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	17.9	Unknown	Unknown	Florida Legislative	Completed	N/A	June 2010	0.00	0.7	0.00	2.6
FDOT5-18	239663-C Widening of State Road 530 from State Road 535 to Hoagland Boulevard (Pond 3)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	16.9	Unknown	Unknown	Florida Legislative	Completed	N/A	June 2010	0.00	0.7	0.00	2.3
FDOT5-19	239663-D Widening of State Road 530 from State Road 535 to Hoagland Boulevard (Pond 4)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	12.6	Unknown	Unknown	Florida Legislative	Completed	N/A	June 2010	0.00	0.5	0.00	2.2
FDOT5-20	242436-A State Road 400 Ramps at Gore Avenue Retention Pits (Pond 1 and 2)	FDOT District 5	Online dry retention	Ramps.	9.8	Unknown	Unknown	Florida Legislative	Completed	N/A	May 2011	0.00	0.2	0.00	2.6

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
FDOT5-21	242484-A Widening of State Road 400 from Universal Boulevard to South Street (Pond 4)	FDOT District 5	Wet detention pond	Add lanes and reconstruct.	21.8	Unknown	Unknown	Florida Legislative	Completed	N/A	May 2011	0.00	0.6	0.00	3.1
FDOT5-22	405515-A and B State Road 400 Wet Detention Pond (Pond 1 and 2)	FDOT District 5	Wet retention	Add lanes and reconstruct.	14.8	Unknown	Unknown	Florida Legislative	Completed	N/A	June 2011	0.00	0.2	0.00	1.2
FDOT5-23	410732-B State Road 400 Swales	FDOT District 5	Dry detention	Add lanes and reconstruct.	32.2	Unknown	Unknown	Florida Legislative	Completed	N/A	November 2010	0.00	0.2	0.00	1.3
FDOT5-24	Street Sweeping	FDOT District 5	Street sweeping	Street sweeping to collect 1,507,453 lbs/yr of material.	N/A	See annual O&M	Unknown	Florida Legislative	Ongoing	N/A	Ongoing	0.05	50.3	0.14	144.8
FDOT5-25	Education and Outreach	FDOT District 5	Public education	Funding for Orange County Water Atlas website, and illicit discharge inspection and training program.	N/A	See annual O&M	Unknown	Florida Legislative	Ongoing	N/A	Ongoing	0.00	1.7	0.02	19.8
OC-1	Education and Outreach	Orange County	Public education	FYN; landscaping, irrigation, fertilizer, and pet waste management ordinances; PSAs; pamphlets; Water Atlas website; and	N/A	Unknown	Unknown	Orange County	Ongoing	N/A	Ongoing	0.59	586.1	13.25	13,247.4

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
				illicit discharge program.											
OC-2	Lake Conway Street Sweeping	Orange County	Street sweeping	Street sweeping of 3,827 curb miles annually.	N/A	See annual O&M	$44,015	Lake Conway Taxing District (MSTU)	Ongoing	N/A	Ongoing	0.01	9.3	0.03	26.7
OC-3	Lake Holden Street Sweeping	Orange County	Street sweeping	Street sweeping of 942 curb miles annually.	N/A	See annual O&M	$15,198	Lake Holden Taxing District (MSTU)	Ongoing	N/A	Ongoing	0.00	2.3	0.01	6.6
OC-4	Lake Jessamine Street Sweeping	Orange County	Street sweeping	Street sweeping of 692 curb miles annually.	N/A	See annual O&M	$11,003	Lake Jessamine Taxing District (MSTU)	Ongoing	N/A	Ongoing	0.00	1.7	0.00	4.8
OC-5	Shingle/Boggy/Hart Basin Street Sweeping	Orange County	Street sweeping	Countywide street sweeping.	N/A	See annual O&M	Unknown	Orange County	Ongoing	N/A	Ongoing	0.00	0.7	0.00	2.1
OC-6	Lake Odell Curb Inlet Basket (CIB)	Orange County	CIB	Curb or grate inlet filter baskets to collect 902 lbs/yr of material.	N/A	$3,000	$666	Orange County	Ongoing	N/A	Ongoing	0.00	0.0	0.00	0.1

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OC-7	Lake Conway CIB Existing	Orange County	CIB	Curb or grate inlet filter baskets to collect 16,169 lbs/yr of material.	N/A	$50,000	$11,000	Lake Conway Taxing District (MSTU)	Ongoing	N/A	Ongoing	0.00	0.4	0.00	2.0
OC-8	Lake Conway CIB New	Orange County	CIB	Curb or grate inlet filter baskets to collect 16,872 lbs/yr of material.	N/A	$37,000	$5,328	Lake Conway Taxing District (MSTU)	Planned and Funded	N/A	Ongoing	0.00	0.5	0.00	2.0
OC-9	Lake Pineloch CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 4,158 lbs/yr of material.	N/A	$18,000	$2,592	Orange County General Fund	Ongoing	N/A	Ongoing	0.00	0.1	0.00	0.5
OC-10	Lake Anderson CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 3,364 lbs/yr of material.	N/A	$10,000	$1,440	Lake Anderson MSTU	Ongoing	N/A	Ongoing	0.00	0.1	0.00	0.4
OC-11	Lake Holden CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 27,602 lbs/yr of material.	N/A	$41,000	$9,102	Lake Holden Taxing District (MSTU)	Ongoing	N/A	Ongoing	0.00	0.7	0.00	3.3
OC-12	Lake Jessamine CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 13,025 lbs/yr of material.	N/A	$110,000	$24,420	Lake Jessamine Taxing District (MSTU)	Ongoing	N/A	Ongoing	0.00	0.3	0.00	1.6
OC-13	Lake Floy CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 4,835 lbs/yr of material.	N/A	$10,000	$1,440	Lake Floy MSTU	Ongoing	N/A	Ongoing	0.00	0.1	0.00	0.6

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OC-14	Lake Cane CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 3,845 lbs/yr of material.	N/A	$14,000	$2,016	Orange County General Fund	Ongoing	N/A	Ongoing	0.00	0.1	0.00	0.5
OC-15	Lake Odell CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 904 lbs/yr of material.	N/A	$3,000	$432	Orange County General Fund	Ongoing	N/A	Ongoing	0.00	0.0	0.00	0.1
OC-16	Lake Tyler CIB	Orange County	CIB	Curb or grate inlet filter baskets.	N/A	$11,000	$1,440	Unknown	Ongoing	N/A	Ongoing	0.00	0.0	0.00	0.0
OC-17	Lake Down CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 16,934 lbs/yr of material.	N/A	$56,000	Unknown	Winder-mere Water and Navigation Control District (MSTU)	Planned and Funded	October 2013	Unknown	0.00	0.5	0.00	2.0
OC-18	Lake Tibet CIB	Orange County	CIB	Curb or grate inlet filter baskets to collect 13,494 lbs/yr of material.	N/A	$31,000	Unknown	Windermere Water and Navigation Control District (MSTU)	Planned and Funded	October 2013	Unknown	0.00	0.4	0.00	1.6
OC-19	Lisa Waterway CDS	Orange County	CDS unit	Treats runoff from Orange Avenue.	N/A	$225,000	$5,362	Lake Conway Taxing District (MSTU)	Ongoing	N/A	Ongoing	0.00	0.3	0.00	1.5
OC-20	Randolph Avenue Continuous Deflective Separation (CDS) Unit	Orange County	CDS unit	Treats runoff from Randolph Avenue.	0	Unknown	Unknown	Unknown	Completed	N/A	Completed	0.00	0.0	0.00	0.0

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OC-21	Randolph Avenue Stormceptor	Orange County	Stormceptor	Stormceptor.	0	Unknown	Unknown	Unknown	Completed	N/A	Completed	0.00	0.0	0.00	0.1
OC-22	Randolph Avenue Pond	Orange County	Dry detention	Dry detention pond.	0	Unknown	Unknown	Unknown	Completed	N/A	Completed	0.00	0.0	0.00	0.4
OC-23	Lake Mary Jess Pond	Orange County/ FDOT District 5, City of Edgewood, Department	Wet detention pond	Wet retention pond created from canal.	31.2	$534,795	$8,000	FDOT District 5, City of Edgewood	Completed	N/A	June 2013	0.00	2.9	0.01	13.1
OC-24	Lake Odell Sediment Sump	Orange County	Retention BMPs	Small sump that collects sediment from roadway, with an estimate of 12,000 lbs/yr of material.	N/A	$33,300	$1,500	Orange County General Fund	Planned and Funded	2013	2014	0.00	0.4	0.00	1.2
OC-25	Lake Jennie Jewel Baffle Box	Orange County	2nd generation baffle box	2nd generation baffle box.	0	$175,000	Unknown	Unknown	Envisioned, Not Funded	2015	Unknown	0.00	0.3	0.02	22.1
OC-26	Lake Anderson Mobile Alum Injection	Orange County	Alum injection	Storm pond enhancement with alum.	0	$75,000	$11,000	Orange County General Fund	Planned and Funded	2014	2016	0.01	12.2	0.26	257.6
OC-27	Lake Jessamine Surface Alum	Orange County	Alum injection	Whole-lake alum treatment.	0	$246,000	Unknown	Lake Jessamine Taxing District (MSTU)	Completed	N/A	2013	0.00	4.5	0.07	71.7

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OC-28	Lake Down Alum Treatment Facility	Orange County	Alum injection	Off-line pond and alum injection system.	378.8	$1,800,000	Unknown	Windermere Water and Navigation Control District (MSTU) & Department Grant	Started	May 2014	October 2014	0.02	21.3	0.56	555.1
OSC-1	Narcoossee Road IB Pond 2 and 3	Osceola County	Wet detention pond	Roadway widening.	29.3	Unknown	Unknown	Unknown	Completed	N/A	September 2011	0.00	0.2	0.01	5.7
OSC-2	Narcoossee Rodd III Pond C3A & C3B	Osceola County	Wet detention pond	Roadway widening.	20.5	Unknown	Unknown	Unknown	Completed	N/A	2012	0.00	0.1	0.00	3.8
OSC-3	Narcoossee Road III Pond D3 Comp	Osceola County	Wet detention pond	Roadway widening.	24.3	Unknown	Unknown	Unknown	Completed	N/A	2012	0.00	0.2	0.00	3.7
OSC-4	Narcoossee Road III Pond E1 Comp	Osceola County	Wet detention pond	Roadway widening.	22.4	Unknown	Unknown	Unknown	Completed	N/A	2012	0.00	0.1	0.00	2.4
OSC-5	Neptune Road I - Ponds 100, 200, and 300	Osceola County	Wet detention pond	Road improvement.	226.8	Unknown	Unknown	Unknown	Completed	N/A	October 2010	0.01	8.3	0.22	219.3
OSC-6	Old Wilson Road Pond D002-P	Osceola County	Online retention	Road improvement.	55.8	Unknown	Unknown	Unknown	Completed	N/A	2012	0.00	0.6	0.02	18.9
OSC-7	Old Wilson Road Pond D004-P	Osceola County	Online retention	Road improvement.	18.7	Unknown	Unknown	Unknown	Completed	N/A	2012	0.00	0.3	0.02	19.8

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OSC-8	Old Wilson Road Pond E002-P	Osceola County	Online retention	Road improvement.	12.5	Unknown	Unknown	Unknown	Completed	N/A	2012	0.00	0.7	0.02	21.3
OSC-9	Stewart Street Regional Pond Retrofit	Osceola County	Wet detention pond	Regional pond retrofit.	2249.2	Unknown	Unknown	Unknown	Completed	N/A	2009	0.07	70.4	1.75	1,747.0
OSC-10	Education	Osceola County	Public education	FYN; landscaping, irrigation, fertilizer, and pet waste management ordinances; PSAs; pamphlets; website; and illicit discharge program.	N/A	Unknown	Unknown	Unknown	Ongoing	N/A	Ongoing	0.32	321.6	10.61	10,612.3
OSC-12	East Lake Reserve Stormwater Reuse	Osceola County	Stormwater reuse	Stormwater reuse for landscape irrigation from pond A1 (9.1A).	130.8	See annual O&M	Unknown	Homeowners Association	Ongoing	N/A	Ongoing	0.01	5.5	0.37	365.4
OSC-13	Neptune Road Stormwater Reuse	Osceola County	Stormwater reuse	Stormwater reuse for landscape irrigation from Ponds 100/101 and 300.	35.7	$640,690	$26,000	Operations	Ongoing	N/A	Ongoing	0.00	1.1	0.02	24.9
OSC-14	Bellalago and Isles of Bellalago Stormwater Reuse	Osceola County	Stormwater reuse	Stormwater reuse for landscape irrigation (197A).	1386.8	See annual O&M	Unknown	Homeowners Association	Ongoing	N/A	Ongoing	0.06	63.8	3.07	3,071.7
OSC-15	Poinciana Commerce Center Reuse	Osceola County	Stormwater reuse	Stormwater reuse for landscape irrigation from Pond 1.	10.2	See annual O&M	Unknown	Private	Planned and Funded	July 2008	Unknown	0.00	0.5	0.01	13.8

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OSC-16	Kissimmee Bay Reuse	Osceola County	Stormwater reuse	Stormwater reuse 20-year duration for 84.5 acres of golf course and five-year duration for 45.5 acres of landscape irrigation.	271	See annual O&M	Unknown	Private	Ongoing	N/A	Ongoing	0.02	19.6	0.91	910.1
OSC-17	Remington	Osceola County	Stormwater reuse	Stormwater reuse for golf course irrigation from Ponds 12, 13, 14A, and 14B.	149.4	See annual O&M	Unknown	Private	Ongoing	N/A	November 2015	0.01	12.1	0.52	523.4
OSC-18	Eagle Lake	Osceola County	Stormwater reuse	Stormwater reuse for turf irrigation.	435.1	See annual O&M	Unknown	Private	Ongoing	N/A	Ongoing	0.02	19.2	0.87	873.9
OSC-19	La Quinta Inn	Osceola County	Stormwater reuse	Stormwater reuse for turf irrigation.	12.5	See annual O&M	Unknown	Private	Ongoing	N/A	Ongoing	0.00	1.7	0.01	14.2
OSC-20	Lake Toho Regional Water Storage Facility (Judge Farms)	Osceola County/ City of Kissimmee	Stormwater reuse	Stormwater reuse.	5883	See annual O&M	Unknown	Multiple	Started, Partially Funded	December 2015	June 2016	0.41	412.1	8.78	8,775.3
OSC-21	Street Sweeping	Osceola County	Street sweeping	Monthly street sweeping.	N/A	See annual O&M	$60,000	Osceola County	Ongoing	N/A	Ongoing	0.02	16.1	0.05	46.2
OSC-22	Buena-ventura Lakes Golf Course Ponds	Osceola County	Wet detention pond	Two new lakes at golf course.	517.7	Unknown	Unknown	Osceola County	Completed	2011	Unknown	0.00	2.0	0.01	6.0
OSC-23	Slaman	Osceola County	Conservation area	Conservation areas.	32.2	See annual O&M	Unknown	Osceola County	Completed	N/A	Completed	0.00	0.0	0.00	0.3
OSC-24	Jim Yates	Osceola County	Conservation area	Conservation areas.	5.3	See annual O&M	Unknown	Osceola County	Completed	N/A	Completed	0.00	0.5	0.00	3.2
OSC-25	Udstad	Osceola County	Conservation area	Conservation areas.	5.9	See annual O&M	Unknown	Osceola County	Completed	N/A	Completed	0.00	0.5	0.01	7.7

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
OSC-26	Proctor	Osceola County	Conservation area	Conservation areas.	0.7	See annual O&M	Unknown	Osceola County	Completed	N/A	Completed	0.00	0.1	0.00	0.3
OSC-27	Twin Oaks	Osceola County	Conservation area	Conservation areas.	399.6	See annual O&M	Unknown	Osceola County	Completed	N/A	Completed	0.05	47.0	0.26	264.9
OSC-28	Cherokee Point	Osceola County	Conservation area	Conservation areas.	178.6	See annual O&M	Unknown	Osceola County	Completed	N/A	Completed	0.00	1.2	0.01	6.7
OSC-29	Encatada Resort	Osceola County	Stormwater reuse	Stormwater reuse.	57.6	See annual O&M	Unknown	Home-owners Association	Ongoing	N/A	Unknown	0.00	3.1	0.03	33.2
OSC-30	Cypress Palms Condos	Osceola County	Stormwater reuse	Stormwater reuse.	12.4	See annual O&M	Unknown	Home-owners Association	Planned and Funded	March 2012	Unknown	0.00	1.0	0.01	10.4
OSC-31	Lake Pointe	Osceola County	Stormwater reuse	Stormwater reuse.	150.2	See annual O&M	Unknown	Home-owners Association	Planned and Funded	May 2012	Unknown	0.01	5.9	0.32	322.3
OSC-32	Traditions at Westside	Osceola County	Storm-water reuse	Stormwater reuse.	21.7	See annual O&M	Unknown	Homeowners Association	Planned and Funded	February 2011	Unknown	0.00	2.3	0.02	19.7
PC-3	Education and Outreach	Polk County	Public education	FYN, fertilizer ordinance, PSAs, pamphlets, website, and illicit discharge inspection program.	N/A	Unknown	Unknown	Polk County	Ongoing	N/A	Ongoing	0.12	118.8	4.44	4,438.1
PC-4	Sumica Preserve Water Storage/ Hydrologic Restoration	Polk County/ SFWMD	DWM	Construction of a gravel berm to store water on-site for wetland restoration.	4077.4	$42,850	$13,000	SFWMD	Operational	N/A	November 2010	0.01	7.5	Not quan-tified	Not quan-tified

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
SFWMD-6	Phase I Rolling Meadows	SFWMD	Restoration	The goal of this project is to restore historic Lake Hatchineha floodplain wetlands and habitat within the Rolling Meadows property which was purchased jointly with the Department.	1900	$43,200,000	Unknown	SFWMD and Department	Planned and Funded	2014	2015-2016	0.07	65.1	Not quantified	Not quantified
SFWMD-7	Gardner-Cobb Marsh	SFWMD	Restoration	Located south of Cypress Lake and includes 23 ditch plugs, berm removal, exotic treatment, and culvert replacement. It helps attenuate regional stormwater runoff and provide incidental nutrient reductions due to plant uptake from overland flows in the marsh.	2000	Unknown	Unknown	SFWMD	Started	2009	Unknown	0.01	5.2	Not quantified	Not quantified

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
SFWMD-8	Rough Island	SFWMD	Restora-tion	Located southwest of Cypress Lake and west of the C-36 Canal. The project includes 31 ditch plugs and exotic removal. It helps attenuate regional stormwater runoff and provides incidental nutrient reductions due to plant uptake from overland flows. Estimated to create 215 acre-ft of storage	1000	Unknown	Unknown	SFWMD	Started	2009	Unknown	0.06	60.8	Not quan-tified	Not quan-tified

Project Number	Project Name	Lead Entity/ Partners	Project Type	Description	Acres Treated	Cost	Annual O&M Cost	Funding Sources	Status	Start Date	Completion Date	TP Reduction (MT/yr)	TP Reduction (kg/yr)	TN Reduction (MT/yr)	TN Reduction (kg/yr)
SFWMD-9	Oasis Marsh Restoration	SFWMD	Restora-tion	The Oasis wetlands are located in floodplain of the southwest corner of Lake Kissimmee and the site is a mosaic of dewatered wetlands and uplands. To restore the floodplain function, four ditches totaling 2.4 acres in size were filled with 3,144 cubic yards of sediment material from a levee adjacent to the site in spring 2010. The restoration of the topography of Oasis Marsh will restore approximately 77 acres of wetlands and reconnect them to the littoral zone of Lake Kissimmee.	77	Unknown	Unknown	SFWMD	Started	2009	Unknown	0.20	195.3	Not quan-tified	Not quan-tified
SFWMD-16	Lost Oak Ranch	SFWMD	DWM	Storage of 374 ac-ft of water through pasture.	N/A	$61,030	$55,000	SFWMD	Started	N/A	Unknown	0.03	28.0	Not quan-tified	Not quan-tified
SFWMD-22	Kissimmee River Headwaters Restoration	SFWMD	Restora-tion	Land use change to wetlands in the project area.	40,875	Unknown	Unknown	SFWMD	Started	Unknown	Unknown	0.57	566.4	Not quan-tified	Not quan-tified

TABLE A-9: PROJECTS UNDER DEVELOPMENT WITH COORDINATING AGENCIES

Note: These attenuated project reductions are calculated specifically to estimate the reductions at the inflow to Lake Okeechobee.

PROJECT NAME	SUB-WATERSHED	STATUS	ESTIMATED TP REDUCTION (MT/YR)	ESTIMATED TP REDUCTION (KG/YR)	SCHEDULE
Istokpoga Marsh Watershed Improvement District-Phase II	Indian Prairie	The Coordinating Agencies are waiting on design and engineering information from Phase I.	2	2,000	Work will begin in 2016.
Lakeside Ranch STA Phase II	Taylor Creek/Nubbin Slough	Permit, funding, and construction are needed. It is expected that the project could be fully operational within 6.5–9 years if funding were available.	7.6	7,600	Project is estimated to be completed by 2023.
MacArthur Agro-Ecology Research Center "Buck Island" Ranch/Rafter T Realty, Inc.	Lake Istokpoga Indian Prairie	Program implementation. SFWMD received $10 million for PES to continue program in 2015. These two projects are currently in contract negotiations.	0.945	945	Work will commence once contracts are in place.
Brighton Valley - Lykes	Indian Prairie	Land available. Expected design, engineering, and SFWMD permitting complete by 2015 if funded to move forward. Note: the reduction values provided by proposer. Needs further development.	7.7	7,700	Start construction 2016. Construction complete 2017.
Rolling Meadows Wetland Restoration - Phase II	Upper Kissimmee	Land acquired and planning started.	0.009	9	Work will be completed 6.5–9 years after commencement of planning activities.
Inactive Dairies- Lagoon Remediation	Taylor Creek/Nubbin Slough and Indian Prairie	Develop program to remediate wastewater lagoons on inactive dairies. This is identified as a potentially significant legacy load and FDACS staff are working on identifying potential participants. Prioritization expected in early summer.	TBD	TBD	1. Identify areas for remediation activities/talk to landowners. (Winter 2014/2015-Summer 2015) 2. Procure contractors/conduct work. (Winter 2015/2016-Spring 2016) 3. Analyze data. (Yearly)
PL-566 Funded/ Fisheating Creek Structure	Fisheating Creek	Natural Resources Conservation Services (NRCS) and FDACS are working on this project with Highlands County.	0.88–2.65	883-2,648	1. NRCS plans to reapply for different funding. (Fall 2014) 2. If funding obtained, work will be conducted. (2015) 3. Water quality benefit calculations will be done. (Fall 2015)
S.R. 710 Regional Project	Taylor Creek/Nubbin Slough and Indian Prairie	Feasibility study underway and expected to be complete in October 2014. Will likely require funding cooperation between the coordinating agencies.	0.121-0.663	121-663	1. Final feasibility study due October 22, 2014. 2. Work will be implemented. (To be determined)

PROJECT NAME	SUB-WATERSHED	STATUS	ESTIMATED TP REDUCTION (MT/YR)	ESTIMATED TP REDUCTION (KG/YR)	SCHEDULE
Legislative Cost-Share Appropriation Program ($10 million annually for seven years)	All	FDACS will identify cost-share projects and nutrient reductions.	26.56	26,560	1. Develop plan and present to the Department by winter 2014. 2. Implement projects by end of 2015. 3. Conduct same exercise annually.
TOTAL	**N/A**	**N/A**	**45.81–48.13**	**45,818-48,125**	**N/A**

TABLE A-10: OTHER INITIATIVES

INITIATIVE	EXPLANATION	SCHEDULE	START DATE	COMPLETION DATE
CERP Planning	SFWMD will consider reinitiating formulation of the storage components of the LOW project; however, this requires concurrence from USACE (Federal Partner).	1. Approach Federal Partner on initiation of reformulation of the LOW project and to assess impacts on the overall CERP Integrated Delivery Schedule (IDS) and CERP cost-share crediting. (Within two years of BMAP adoption). 2. If the USACE is amenable and impacts to the IDS and cost-share crediting are acceptable to the partners, SFWMD will initiate reformulation. (Within five years of BMAP adoption). 3. Plan reformulation complete by 2024.	Fall 2016	Fall 2024
Owner-implemented BMP verification	FDACS and Department developing a plan for BMP verification.	1. Identify key BMPs for each commodity type in the basin. (Spring 2015) 2. Identify locations of BMPs in basin. (Fall 2015) 3. Develop monitoring plan/strategy. (Winter 2015/2016) 4. Identify willing owners. (Spring 2016) 5. Begin data collection. (Summer 2016) 6. Form committee to review findings. (Winter 2016/2017) 7. Data evaluation. (Annually)	Spring 2015	Winter 2016/2017
Cost-share BMP effectiveness verification	FDACS and Department developing approach to evaluate effectiveness of various types of cost-share projects.	1. Identify key cost-share projects. (Fall 2015) 2. Identify locations for effectiveness evaluation. (Winter 2015/2016) 3. Develop evaluation approach (monitoring/modeling/calculation). (Winter 2015/2016) 4. Implement cost-share projects. (Spring 2016) 5. Data evaluation. (Annually)	Fall 2015	Spring 2016
WAM revisions	Coordinating Agencies developing contract to revise the WAM to complete the model domain set-up for the northern region and the 3 southern sub-watersheds of the LOW. Estimated completion date: a year after the adoption of the BMAP. Department will work to develop revised allocations and targets based on this information.	1. Develop scope of work for contract. (Fall 2014) 2. Execute contract. (Fall 2014) 3. Complete WAM efforts. (Winter 2015/2016) 4. Conduct sensitivity/uncertainty analyses and pre-drainage characterization. (Spring 2016) 5. Use WAM results to update sub-watershed existing loads and project nutrient reduction benefits in the northern sub-watersheds and to develop existing loads in the southern sub-watersheds and calculate project nutrient reduction benefits. (Fall 2016) 6. Identify elevated TP areas for additional project locations and prioritization. (Winter 2016/2017)	Fall 2014	Winter 2016/2017

INITIATIVE	EXPLANATION	SCHEDULE	START DATE	COMPLETION DATE
Water quality monitoring	As the Department develops the monitoring plan for the BMAP, consideration is being given to areas with on the ground projects/BMPs to evaluate water quality improvements.	1. Identify areas with regional projects already in place. (Complete) 2. Evaluate areas with needs for additional water quality data. (Once WAM complete.) 3. Identify lead entity for monitoring efforts. (Spring 2017-Summer 2017) 4. Finalize monitoring plan. (Upon BMAP adoption)	In Progress	Fall 2018

APPENDIX B: LAND USE CLASSIFICATIONS

TABLE B-1: RELATIONSHIP BETWEEN UPDATED FLUCCS CODE AND WAM CLASSIFICATIONS

UPDATED FLUCCS	UPDATED FLUCCS CODE DESCRIPTION	WAM LAND USE IDENTIFICATION	WAM LAND USE DESCRIPTION
1100	Residential Low Density <2 dwelling units per acre (du/ac)	2	Low Density Residential
1110	Low Density: Fixed Single Family Units	2	Low Density Residential
1120	Low Density: Mobile Home Units	2	Low Density Residential
1130	Low Density: Mixed Units, Fixed and Mobile Home U*	2	Low Density Residential
1180	Low Density: Rural Residential	2	Low Density Residential
1190	Low Density: Under construction	2	Low Density Residential
1200	Residential Medium Density 2-5 du/ac	19	Medium Density Residential
1210	Medium Density: Fixed Single Family Units	19	Medium Density Residential
1220	Medium Density: Mobile Home Units	19	Medium Density Residential
1230	Medium Density: Mixed Units, Fixed and Mobile Homes	19	Medium Density Residential
1290	Medium Density: Under construction	19	Medium Density Residential
1300	Residential High Density >5 du/ac	20	High Density Residential
1310	High Density: Fixed Single Family Units	20	High Density Residential
1320	High Density: Mobile Home Units	20	High Density Residential
1330	Multiple Dwelling Units, Low Rise	21	Multiple Dwelling Units
1340	Multiple Dwelling Units, High Rise	21	Multiple Dwelling Units
1350	High Density: Mixed Units, Fixed and Mobile Home *	20	High Density Residential
1390	High Density: Under construction	20	High Density Residential
1400	Commercial and Services	3	Commercial and Services
1411	Shopping Centers	3	Commercial and Services
1423	Wholesale Sales and Services - Junk Yards	3	Commercial and Services
1460	Oil and Gas Storage - Not Industrial or Manufacturing	3	Commercial and Services
1480	Cemeteries	23	Managed Landscape
1490	Commercial and Services Under Construction	3	Commercial and Services
1500	Industrial	22	Industrial
1550	Other Light Industrial	22	Industrial
1560	Other Heavy Industrial	22	Industrial
1600	Extractive	73	Mining
1611	Strip Mines - Clays	73	Mining
1620	Sand and Gravel Pits	73	Mining
1630	Rock Quarries	73	Mining
1650	Reclaimed Mine Land	5	Scrub and Brushland
1660	Holding Ponds	73	Mining
1670	Abandoned Mining Lands	73	Mining
1700	Institutional	3	Commercial and Services

UPDATED FLUCCS	UPDATED FLUCCS CODE DESCRIPTION	WAM LAND USE IDENTIFICATION	WAM LAND USE DESCRIPTION
1710	Educational Facilities	3	Commercial and Services
1730	Military	3	Commercial and Services
1760	Correctional	72	Prisons
1800	Recreational	3	Commercial and Services
1810	Swimming beach	3	Commercial and Services
1820	Golf Course	23	Managed Landscape
1830	Race Tracks	24	Animal Race Tracks
1840	Marinas and Fish Camps	3	Commercial and Services
1850	Parks and Zoos	23	Managed Landscape
1860	Community Recreational Facilities	3	Commercial and Services
1870	Stadiums: Not Academic	3	Commercial and Services
1900	Open Land <Urban>	70	Undeveloped Urban Land
1920	Inactive Land with Street Pattern	70	Undeveloped Urban Land
2100	Cropland and Pastureland	4	Rural Land in Transition
2110	Improved Pastures	26	Improved Pasture
2120	Unimproved Pastures	27	Unimproved Pasture
2130	Woodland Pastures	28	Woodland Pasture
2140	Row Crops	25	Row Crops
2150	Field Crops	62	Field Crops
2156	Field Crops - Sugar Cane	68	Sugar Cane
2200	Tree Crops	84	Citrus Groves
2210	Citrus Groves	84	Citrus Groves
2230	Other Groves	30	Groves and Orchards
2240	Abandoned Groves	30	Groves and Orchards
2300	Feeding Operations	32	Cattle Feeding Operation
2310	Cattle Feeding Operations	32	Cattle Feeding Operation
2320	Poultry Feeding Operations	33	Poultry Feeding Operation
2400	Nurseries and Vineyards	35	Tree Nurseries
2410	Tree Nurseries	35	Tree Nurseries
2420	Sod Farms	36	Sod Farms
2430	Ornamentals	37	Ornamental Nurseries
2500	Specialty Farms	39	Dairies
2510	Horse Farms	38	Horse Farms
2520	Dairies	39	Dairies
2540	Aquaculture	41	Aquaculture
2600	Other Open Land <Rural>	5	Scrub and Brushland
2610	Fallow Cropland	5	Scrub and Brushland
3100	Herbaceous (Dry Prairie)	5	Scrub and Brushland
3200	Upland Shrub and Brush land	5	Scrub and Brushland
3210	Palmetto Prairies	5	Scrub and Brushland

UPDATED FLUCCS	UPDATED FLUCCS CODE DESCRIPTION	WAM LAND USE IDENTIFICATION	WAM LAND USE DESCRIPTION
3300	Mixed Rangeland	5	Scrub and Brushland
4100	Upland Coniferous Forests	5	Scrub and Brushland
4110	Pine Flatwoods	5	Scrub and Brushland
4120	Longleaf Pine - Xeric Oak	7	Hardwood Conifer Mixed
4130	Sand Pine	5	Scrub and Brushland
4140	Pine - Mesic Oak	7	Hardwood Conifer Mixed
4200	Upland Hardwood Forests	7	Hardwood Conifer Mixed
4210	Xeric Oak	6	Hardwoods
4220	Brazilian Pepper	7	Hardwood Conifer Mixed
4240	Melaleuca	7	Hardwood Conifer Mixed
4270	Live Oak	6	Hardwoods
4271	Oak - Cabbage Palm	7	Hardwood Conifer Mixed
4280	Cabbage Palm	7	Hardwood Conifer Mixed
4340	Hardwood - Coniferous Mixed	7	Hardwood Conifer Mixed
4400	Tree Plantations	8	Coniferous Plantations
4410	Coniferous Plantations	8	Coniferous Plantations
4420	Hardwood Plantations	8	Coniferous Plantations
4430	Forest Regeneration Areas	8	Coniferous Plantations
5100	Streams and Waterways	9	Open Water
5110	Natural River, Stream, Waterway	9	Open Water
5120	Channelized Waterways, Canals	9	Open Water
5200	Lakes	9	Open Water
5250	Marshy Lakes	9	Open Water
5300	Reservoirs	9	Open Water
5600	Slough Waters	9	Open Water
6100	Wetland Hardwood Forests	12	Mixed Wetland Hardwoods
6110	Bay Swamps	10	Bay Swamps
6111	Bayhead	10	Bay Swamps
6150	Stream and Lake Swamps (Bottomland)	15	Wetland Forested Mixed
6170	Mixed Wetland Hardwoods	12	Mixed Wetland Hardwoods
6172	Mixed Wetland Hardwoods - Mixed Shrubs	12	Mixed Wetland Hardwoods
6180	Cabbage Palm Wetland	15	Wetland Forested Mixed
6181	Cabbage Palm Hammock	15	Wetland Forested Mixed
6191	Wetland Melaleuca	15	Wetland Forested Mixed
6200	Wetland Coniferous Forests	15	Wetland Forested Mixed
6210	Cypress	14	Cypress
6215	Cypress - Domes/Heads	16	Freshwater Marshes
6216	Cypress - Mixed Hardwoods	16	Freshwater Marshes
6240	Cypress - Pine - Cabbage Palm	15	Wetland Forested Mixed
6250	Hydric Pine	15	Wetland Forested Mixed

UPDATED FLUCCS	UPDATED FLUCCS CODE DESCRIPTION	WAM LAND USE IDENTIFICATION	WAM LAND USE DESCRIPTION
6300	Wetland Forested Mixed	15	Wetland Forested Mixed
6410	Freshwater Marshes / Gramminoid Prairie - Marsh	16	Freshwater Marshes
6411	Freshwater Marshes - Sawgrass	16	Freshwater Marshes
6430	Wet Prairies	16	Freshwater Marshes
6440	Emergent Aquatic Vegetation	16	Freshwater Marshes
6460	Mixed Scrub-Shrub Wetland	16	Freshwater Marshes
6500	Non-Vegetated Wetland	16	Freshwater Marshes
6520	Shorelines	17	Barren Land
6530	Intermittent Ponds	17	Barren Land
7200	Sand Other Than Beaches	17	Barren Land
7400	Disturbed Lands	17	Barren Land
7410	Rural Land in Transition	4	Rural Land in Transition
7420	Borrow Areas	17	Barren Land
7430	Spoil Areas	17	Barren Land
7470	Dikes and Levees	17	Barren Land
8100	Transportation	18	Transportation Corridors
8110	Airports	3	Commercial and Services
8113	Private Airports	3	Commercial and Services
8115	Grass Airports	17	Barren Land
8120	Railroads and Rail yards	3	Commercial and Services
8140	Roads and Highways	18	Transportation Corridors
8180	Auto Parking Facilities	3	Commercial and Services
8200	Communications	3	Commercial and Services
8300	Utilities	22	Industrial
8310	Electrical Power Facilities	22	Industrial
8320	Electrical Power Transmission Lines	5	Scrub and Brushland
8330	Water Supply Plants - including Pumping Stations	22	Industrial
8340	Sewage Treatment	43	Sewage Treatment
8350	Solid Waste Disposal	44	Solid Waste Disposal
8370	Surface Water Collection Basins	3	Commercial and Services
9520	Inactive Dairy	89	Inactive Dairy

TABLE B-2: 2009 LEVEL 2 LAND USES IN THE LAKE OKEECHOBEE WATERSHED

- = Empty cell/no data

LEVEL 2 LAND USE CODE	LAND USE	ACRES	% TOTAL
1100	Residential, Low Density (not used in map)	106,463.78	2.73%
1200	Residential, Medium Density (not used in map)	97,989.36	2.51%
1300	Residential, High Density (not used in map)	23,478.42	0.60%
1400	Commercial and Services	39,001.06	1.00%
1500	Industrial	5,899.79	0.15%
1600	Extractive	8,145.67	0.21%
1700	Institutional	12,478.48	0.32%
1800	Recreational	17,150.23	0.44%
1900	Open Land	43,218.34	1.11%
2100	Cropland and Pastureland (not used in map)	1,448,102.51	37.15%
2200	Tree Crops (not used in map)	206,769.40	5.30%
2300	Feeding Operations	745.94	0.02%
2400	Nurseries and Vineyards	16,441.46	0.42%
2500	Specialty Farms	23,845.00	0.61%
2600	Other Open Lands - Rural (not used in map)	36,584.01	0.94%
3100	Herbaceous (Dry Prairie)	46,869.51	1.20%
3200	Upland Shrub and Brushland	144,332.78	3.70%
3300	Mixed Rangeland	15,149.57	0.39%
4100	Upland Coniferous Forests	106,526.08	2.73%
4200	Upland Hardwood Forests	46,328.30	1.19%
4300	Upland Mixed Forests (not used in map)	40,367.38	1.04%
4400	Tree Plantations	58,163.32	1.49%
5100	Streams and Waterways (not used in map)	18,834.49	0.48%
5200	Lakes	530,714.66	13.62%
5300	Reservoirs	24,851.00	0.64%
5600	Slough Waters	317.81	0.01%
6100	Wetland Hardwood Forests	147,027.67	3.77%
6200	Wetland Coniferous Forests	129,612.71	3.33%
6300	Wetland Forested Mixed	38,927.65	1.00%
6400	Vegetated Non-Forested Wetlands (not used in map)	385,535.48	9.89%
6500	Non-Vegetated Wetland	1,673.04	0.04%
7200	Sand Other Than Beaches	3.35	0.00%
7400	Disturbed Land	24,115.21	0.62%
8100	Transportation	29,524.65	0.76%
8200	Communications	330.55	0.01%
8300	Utilities	9,259.31	0.24%
9500	Inactive Dairy	13,076.81	0.34%
-	**Total**	**3,897,854.81**	**100.00%**

APPENDIX C: LAKE OKEECHOBEE BMAP SUB-WATERSHEDS

Boundaries for the nine individual sub-watersheds are shown in **Figure C-1** through **Figure C-9**. Each figure also depicts basin designations and SFWMD structures for the sub-watershed.

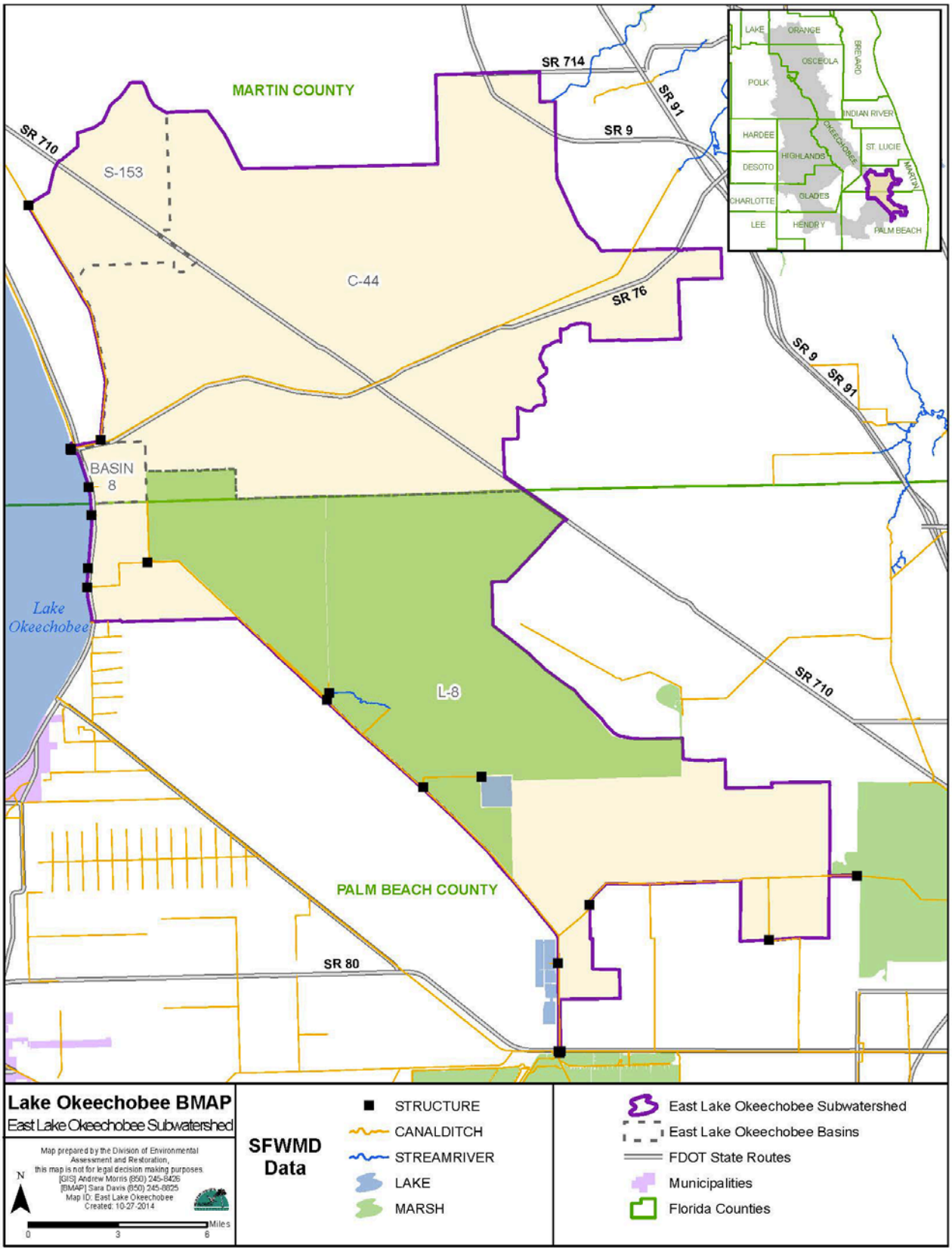

FIGURE C-1: EAST LAKE OKEECHOBEE SUB-WATERSHED

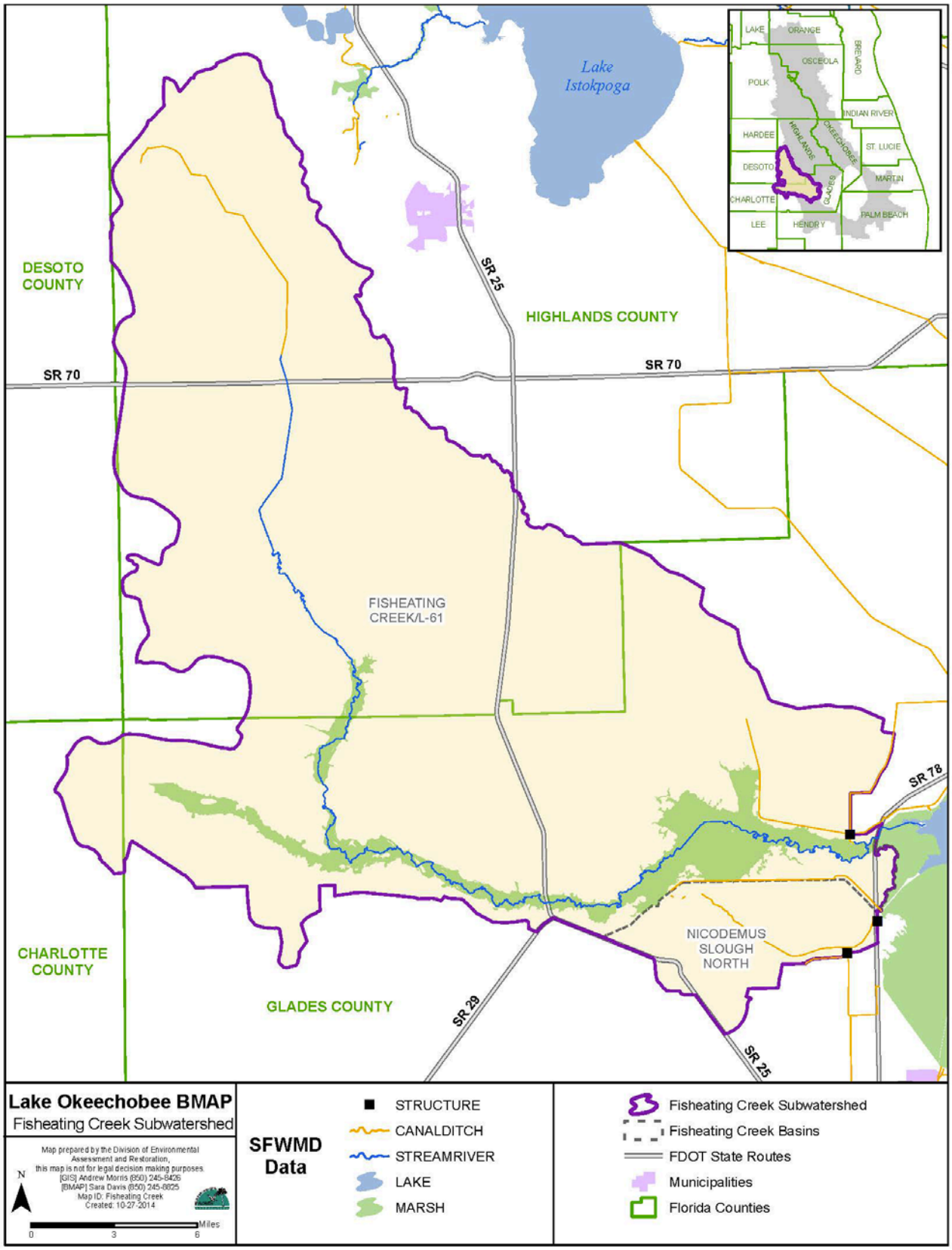

FIGURE C-2: FISHEATING CREEK SUB-WATERSHED

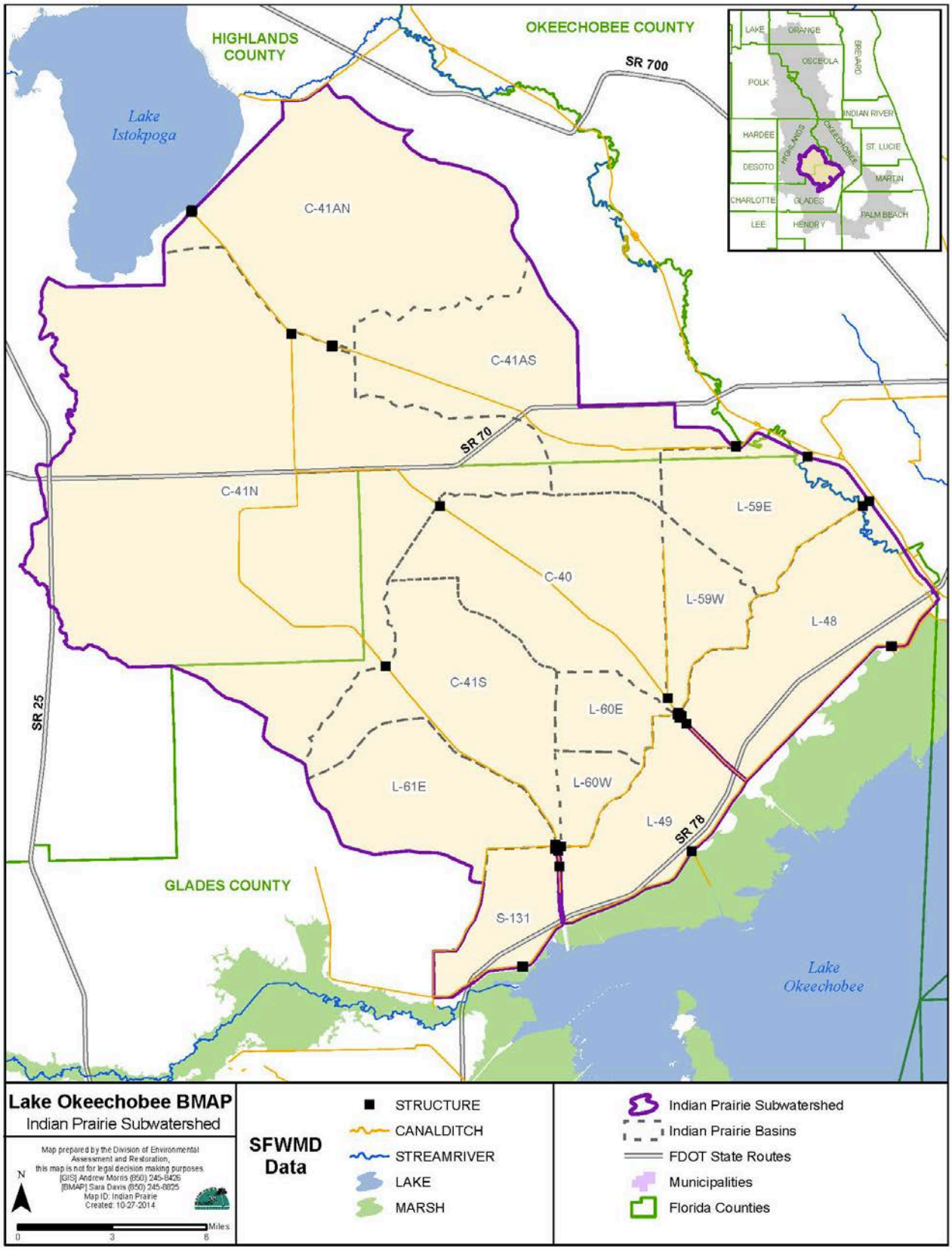

FIGURE C-3: INDIAN PRARIE SUB-WATERSHED

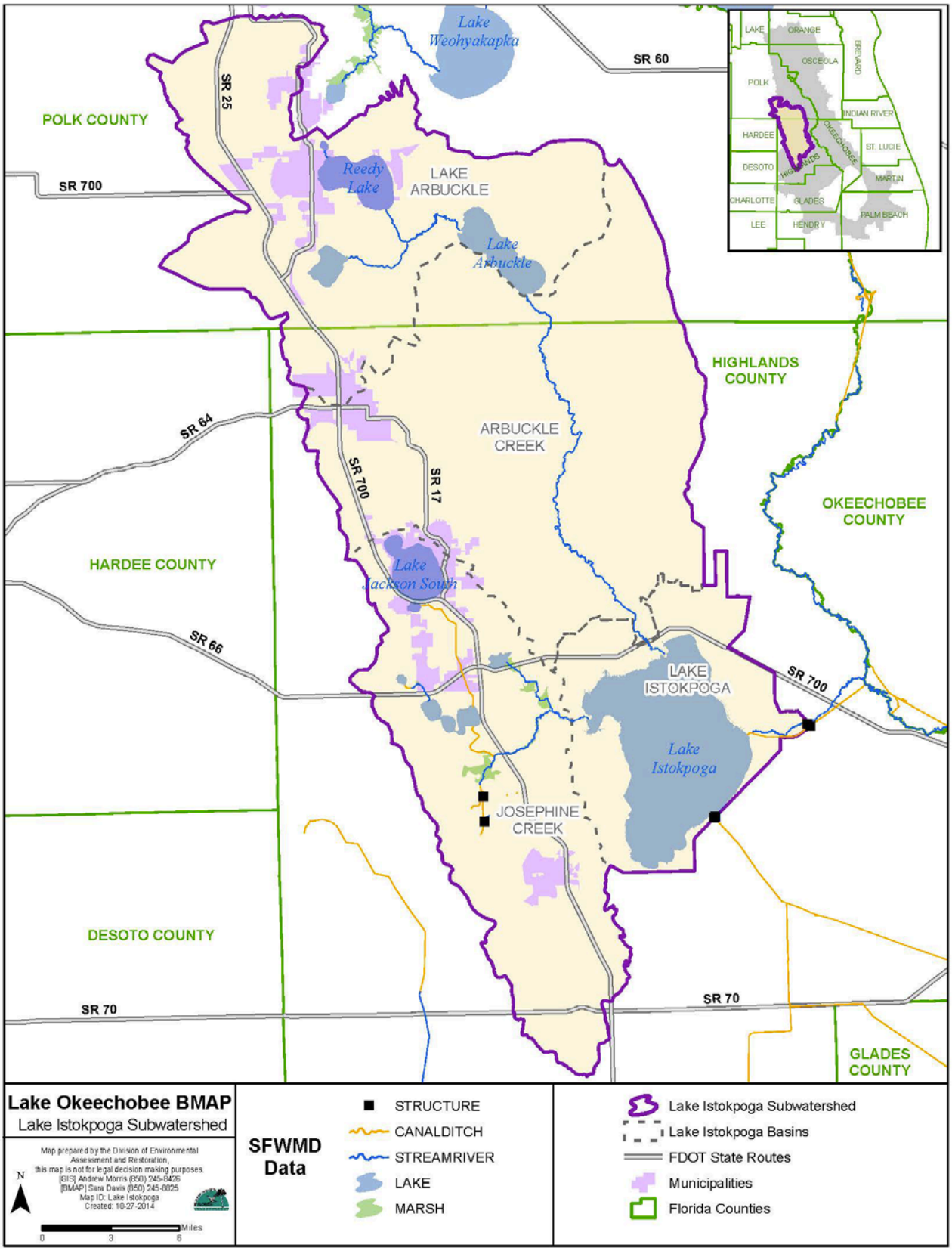

FIGURE C-4: LAKE ISTOKPOGA SUB-WATERSHED

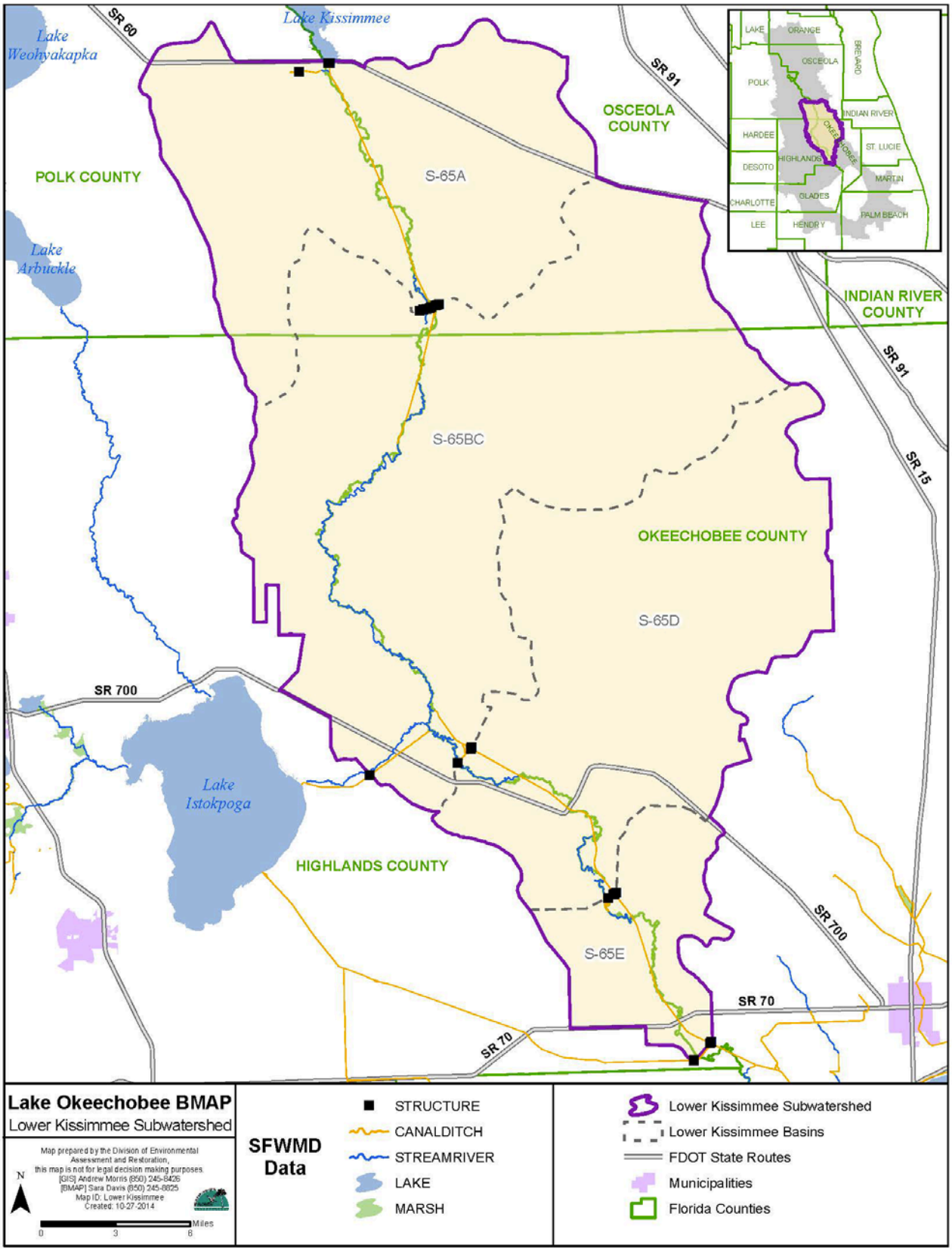

FIGURE C-5: LOWER KISSIMMEE SUB-WATERSHED

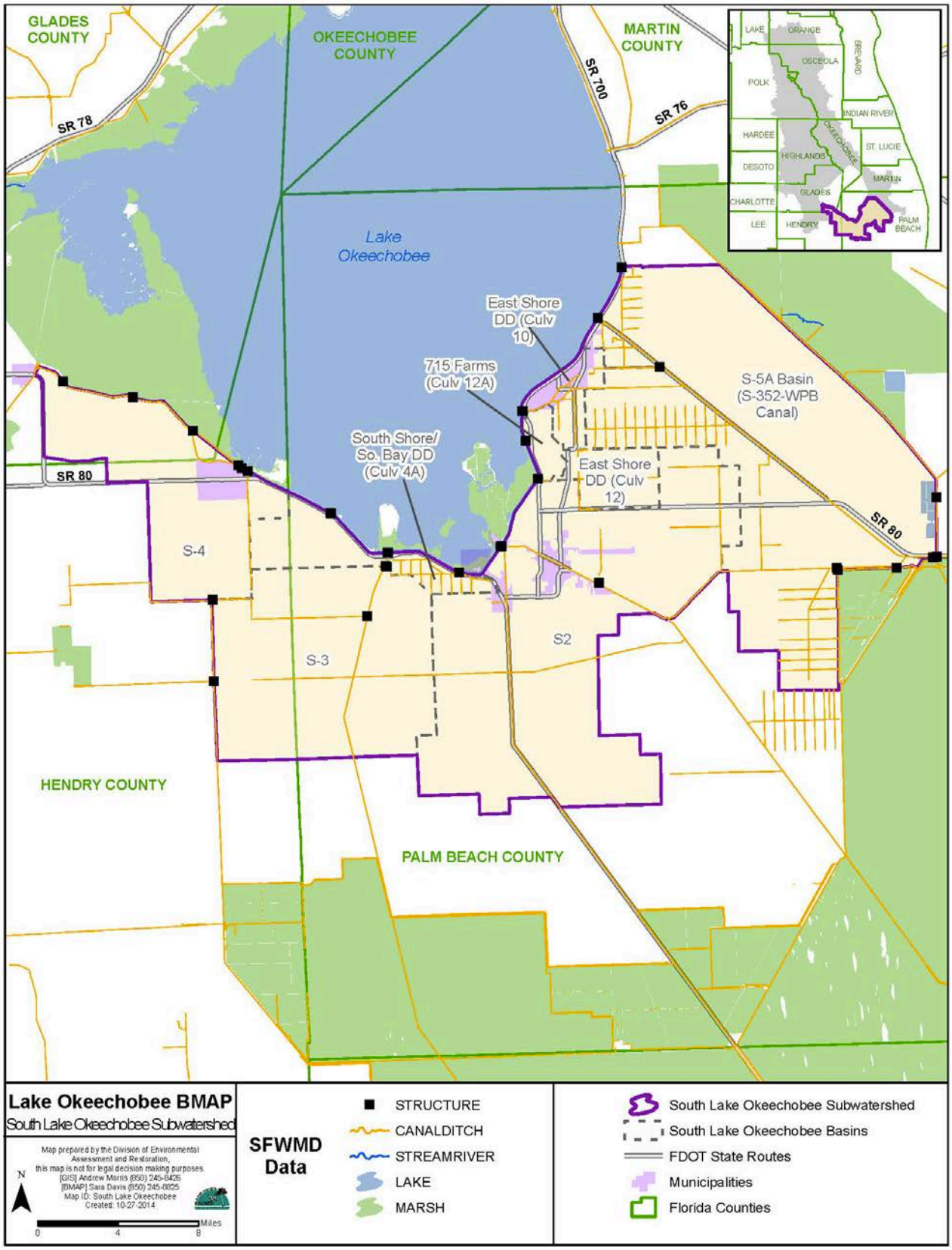

FIGURE C-6: SOUTH LAKE OKEECHOBEE SUB-WATERSHED

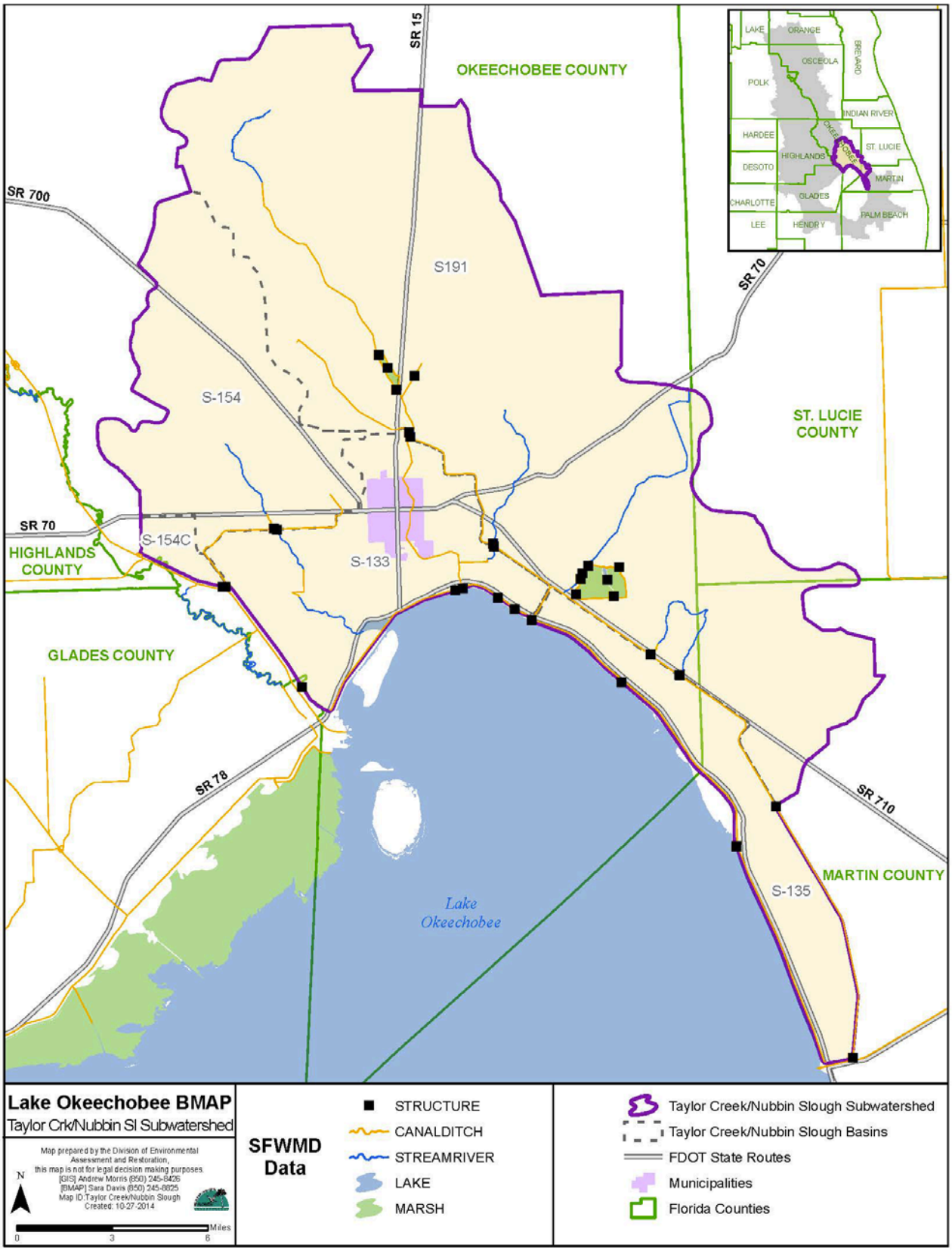

FIGURE C-7: TAYLOR CREEK/NUBBIN SLOUGH SUB-WATERSHED

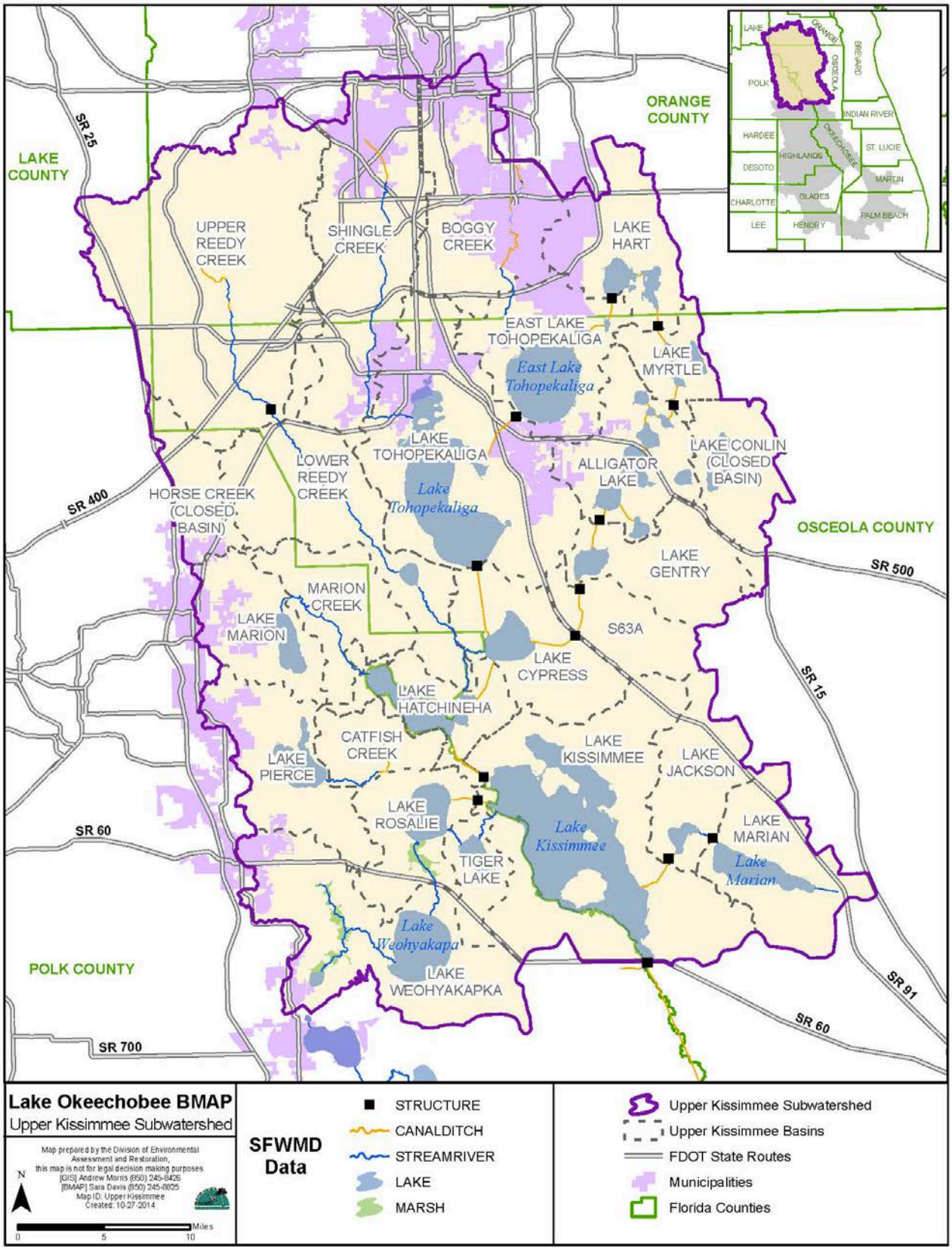

FIGURE C-8: UPPER KISSIMMEE SUB-WATERSHED

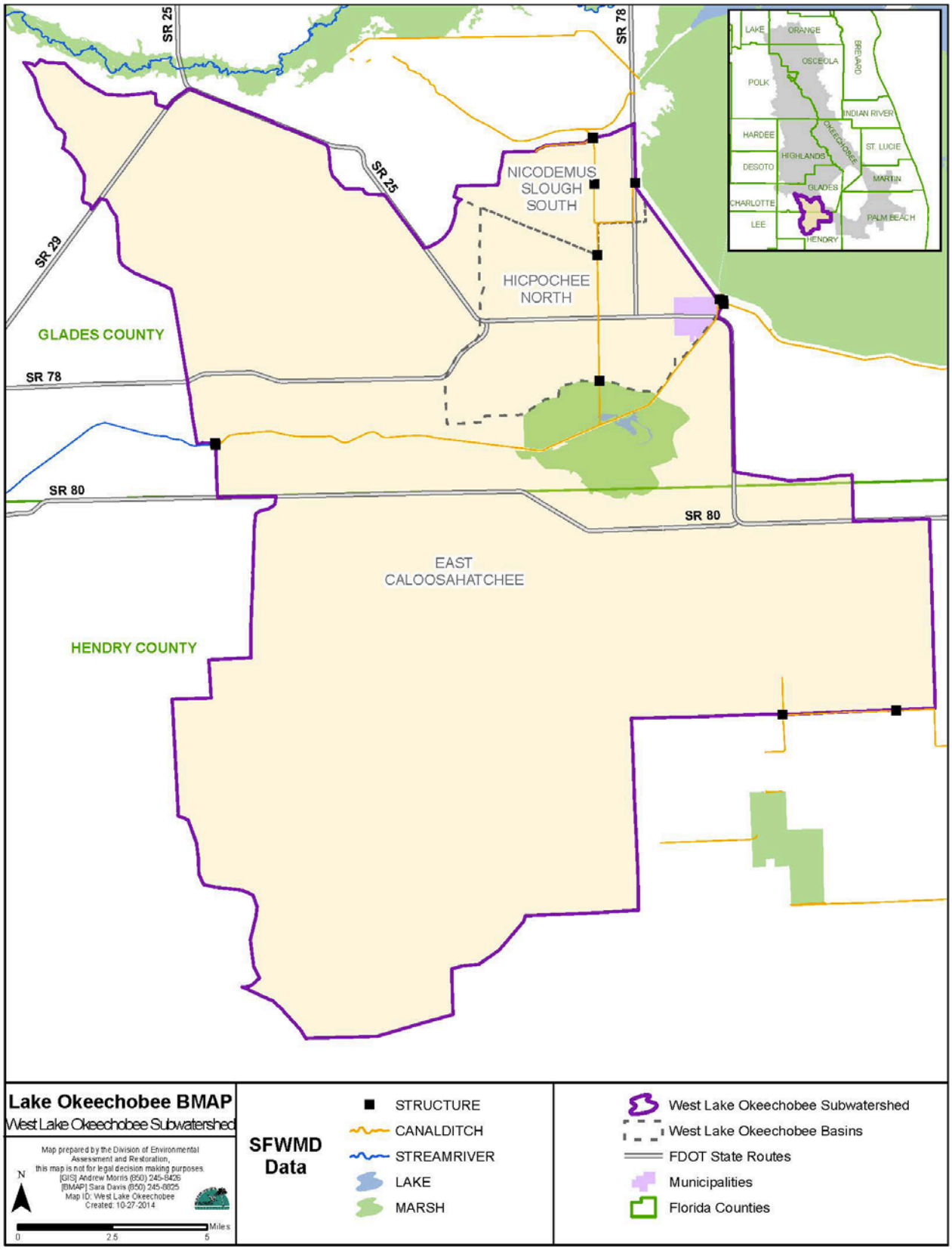

FIGURE C-9: WEST LAKE OKEECHOBEE SUB-WATERSHED

APPENDIX D: POTENTIAL FUNDING SOURCES

Potential funding sources for implementation of the management strategies in this BMAP are as follows:

The **Clean Water State Revolving Fund (SRF) loan program** provides low-interest loans to local governments to plan, design, and build or upgrade wastewater, stormwater, and nonpoint source pollution prevention projects. Certain agricultural best management practices may also qualify for funding. Discounted assistance for small communities is available. Interest rates on loans are below market rates and vary based on the economic wherewithal of the community. The Clean Water SRF is Florida's largest financial assistance program for water infrastructure. More information is available at www.dep.state.fl.us/water/wff/cwsrf.

The **Drinking Water SRF loan program** provides low-interest loans to local governments and certain private utilities to plan, design, and build or upgrade drinking water systems. Discounted assistance for small communities may be available. Interest rates on loans are typically 40% below market rates. More information is available at www.dep.state.fl.us/water/wff/dwsrf.

The **Small Community Wastewater Facilities Grants Program** provides grants to fund the construction of wastewater facilities in municipalities with 10,000 or fewer people and per capita income levels below Florida's average per capita income. A local match is required. The program is linked to the Clean Water SRF loan program outlined above, and is highly competitive. More information is available at www.dep.state.fl.us/water/wff/cwsrf/smalcwgp.htm.

Florida's **Section 319 grant program** administers funds received from EPA to implement projects or programs that reduce nonpoint sources of pollution. Projects or programs must benefit Florida's priority watersheds ("impaired waters"), and local sponsors must provide at least a 40% match or in-kind contribution. Eligible activities include demonstration and evaluation of urban and agricultural stormwater BMPs, stormwater retrofits, and public education. More information is available at www.dep.state.fl.us/water/nonpoint/319h.htm.

Funding for projects related to the implementation of **Total Maximum Daily Load** determinations may be available through periodic legislative appropriations to the Department. When funds are available, the program prioritizes stormwater retrofit projects to benefit impaired waters, somewhat along the lines of the Section 319 grant program listed above. More information is available at www.dep.state.fl.us/water/watersheds/tmdl_grant.htm.

The Florida Legislature may solicit applications directly for **Community Budget Issue Request** projects, including water projects, in anticipation of upcoming legislative sessions. This process is an opportunity to secure legislative sponsorship of project funding through the state budget. The Legislature may coordinate applications with the Department. In other years, the Legislature will not solicit projects but may include them in the budget in any event. You are advised to contact your local legislative delegation to determine whether there are opportunities available to fund your project. Information on contacting Senators and Representatives is available at www.leg.state.fl.us.

There are a number of other programs at both the state and federal levels that offer the possibility of water infrastructure funding. These include:

Florida Department of Economic Opportunity **Small Cities Community Development Block Grant Program** – Funds are available annually for water and sewer projects that benefit low- and moderate-income persons. Monies also may be available for water and sewer projects that serve a specific "job-creating entity" as long as most of the jobs created are for people with low or moderate incomes. For more information, visit http://www.floridajobs.org/community-planning-and-development/assistance-for-governments-and-organizations/florida-small-cities-community-development-block-grant-program.

Florida Rural Water Association Loan Program – This program provides low-interest bond or bank financing for community utility projects in coordination with the Department's SRF programs discussed above. Other financial assistance may also be available. For more information, visit www.frwa.net/ and look for the links to "Funding" and "Long-Term Financing."

Enterprise Florida – Enterprise Florida's program is a resource for a variety of public and private projects and activities, including those in rural communities, to facilitate the creation, capital investment, and strengthening and diversification of local economies by promoting tourism, trade and economic development. The various Enterprise Florida programs and financial incentives are intended, among other things, to provide additional financial assistance to enable communities to better access other infrastructure funding programs. For more information, visit www.eflorida.com/; contact information is available from the "Contact Us" link at the top of the page.

Florida's **five regional water management districts** also offer financial assistance for a variety of water-related projects, for water supply development, water resource development, and surface water restoration. Assistance may be provided from ad valorem tax revenues or from periodic legislative appropriations for Alternative Water Supply Development and Surface Water Improvement and Management projects. The

amount of funding available, matching requirements, and types of assistance may vary from year to year. For information on funding opportunities, contact the water management district with jurisdiction in your area—see www.dep.state.fl.us/secretary/watman for a map and links to each of the districts.

U.S. Department of Commerce **Economic Development Administration Public Works and Development Facilities Program** – The program provides funding to help distressed communities in economic decline revitalize, expand, and upgrade their physical infrastructure to attract new industry, encourage business expansion, diversify local economies, and generate or retain long-term, private sector jobs and investment. The program focuses on redeveloping existing infrastructure. For more information, visit www.eda.gov/investmentPriorities.htm.

U.S. Department of Agriculture **Rural Development Rural Utilities Service Guaranteed and Direct Loans and Grants** – This program provides a combination of loans and grants for water, wastewater, and solid waste projects to rural communities and small incorporated municipalities. Some nonprofit entities also may be eligible. For more information, visit http://www.rurdev.usda.gov/UWEP_HomePage.html.

Congress's **State and Tribal Assistance Grant Program** provides the opportunity to secure Congressional sponsorship of project funding, including water project funding, through the annual federal budget process. The program's stated purpose is to strengthen state, local governments, and tribal abilities to address environmental and public health threats while furthering environmental compliance. You may want to consider contacting your Representatives or Senators for assistance in pursuing funding; see http://thomas.loc.gov/links/.

Grants.gov at http://www.grants.gov/, which is the official federal website for information on more than 1,000 federal grant programs. The site includes an automatic email notification system for keeping apprised of federal grant opportunities.

Catalog of Federal Domestic Assistance at http://www.cfda.gov/, which provides a database of all federal programs available to state and local governments; public, quasi- public, and private profit and nonprofit organizations and institutions; specialized groups; and individuals. There are a variety of sources of niche funding that may be appropriate to your situation. There are also private funding sources (endowments, private trusts, etc.) that may, on occasion, fund water-related projects; a variety of sources to investigate these opportunities are available on the web.

The **Florida Resource Directory** at http://redi.state.fl.us/ provides a searchable directory of information about and links to many state and federal programs with resources available to help local communities. Funding for water-related projects is just one of many types of assistance identified here.

If you are interested in **disaster relief**, your first contacts should be to Florida's **Division of Emergency Management** at http://www.floridadisaster.org/ or your county emergency management agency (see www.floridadisaster.org/fl_county_em.asp); and the **Federal Emergency Management Agency** at 1.800.621.FEMA (3362), or visit www.fema.gov/government/grant/pa/index.shtm, where the process for securing disaster-related infrastructure assistance begins.

APPENDIX E: BIBLIOGRAPHY OF KEY REFERENCES AND WEBSITES

KEY REFERENCES

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STORMWATER AND WATER QUALITY PROTECTION WEBSITES

TABLE E-1: LOCAL AND REGIONAL STORMWATER AND WATER QUALITY PROTECTION WEBSITES

SITE	WEBSITE LINK
SFWMD	http://my.sfwmd.gov/portal/page/portal/sfwmdmain/home%20page
South Florida Environmental Report	http://my.sfwmd.gov/portal/page/portal/xweb%20about%20us/agency%20reports
Lake Okeechobee Watershed Protection Program Annual and Three-Year Update 2014	http://www.sfwmd.gov/portal/page/portal/pg_grp_sfwmd_sfer/portlet_prevreport/2014_sfer/v1/chapters/v1_ch8.pdf

TABLE E-2: STATE STORMWATER AND WATER QUALITY PROTECTION WEBSITES

SITE	WEBSITE LINK
General Portal for Florida	http://www.myflorida.com
Department	http://www.dep.state.fl.us/
Watershed Management	http://www.dep.state.fl.us/water/watersheds/index.htm
TMDL Program	http://www.dep.state.fl.us/water/tmdl/index.htm
BMPs, Public Information	http://www.dep.state.fl.us/water/nonpoint/pubs.htm
NPDES Stormwater Program	http://www.dep.state.fl.us/water/stormwater/npdes/index.htm
Nonpoint Source Funding Assistance	http://www.dep.state.fl.us/water/nonpoint/319h.htm
Surface Water Quality Standards	http://www.dep.state.fl.us/legal/Rules/shared/62-302/62-302.pdf
Identification of Impaired Surface Waters Rule	http://www.dep.state.fl.us/legal/Rules/shared/62-303/62-303.pdf
Lake Okeechobee Water Quality Assessment Report	http://www.dep.state.fl.us/water/basin411/lake_o/index.htm
STORET Program	http://www.dep.state.fl.us/water/storet/index.htm
Criteria for Surface Water Quality Classifications	http://www.dep.state.fl.us/water/wqssp/classes.htm
FDACS Office of Agricultural Water Policy	http://www.floridaagwaterpolicy.com/

TABLE E-3: NATIONAL STORMWATER AND WATER QUALITY PROTECTION WEBSITES

SITE	WEBSITE LINK
Center for Watershed Protection	http://www.cwp.org/
EPA Office of Water	http://www.epa.gov/water
EPA Region 4 (Southeast United States)	http://www.epa.gov/region4
Clean Water Act History	http://www.epa.gov/lawsregs/laws/cwahistory.html
USGS: Florida Waters	http://sofia.usgs.gov/publications/reports/floridawaters/#options