STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In re:
AMENDMENTS TO THE UPPER OCKLAWAHA RIVER BASIN MANAGEMENT ACTION PLAN
_____/

OGC Case No. 19-0435

FINAL ORDER AMENDING THE UPPER OCKLAWAHA RIVER BASIN MANAGEMENT ACTION PLAN

Pursuant to Section 403.067(7), Florida Statutes, this Final Order adopts amendments to the 2007 Upper Ocklawaha River Basin Management Action Plan ("BMAP"), as that BMAP was updated and supplemented in 2014. These amendments, entitled "Upper Ocklawaha River Basin Management Action Plan Amendment" and dated June 2019, are attached hereto and incorporated herein as Exhibit 1. The 2007 Upper Ocklawaha River BMAP, as supplemented in 2014, remains in full force and effect, except as modified by the amendments in Exhibit 1.

The Upper Ocklawaha River BMAP, as amended, has been developed as part of the Department's Total Maximum Daily Load ("TMDL") Program, as authorized under the Florida Watershed Restoration Act (Section 403.067, Florida Statutes). Surface waters covered in the Upper Ocklawaha River BMAP are designated as Class III waters in accordance with Chapter 62-302, Florida Administrative Code ("F.A.C."). Water quality for Class III waters is meant to

be suitable for recreational use and for the propagation and maintenance of a healthy, well-balanced population of fish and wildlife.

The Upper Ocklawaha River Basin is located mostly in Lake County, as well as the northwest portion of Orange County, southern Marion County, and the northern part of Polk County. In 2003, 2006 and 2017, the Department established TMDLs for waters within the Upper Ocklawaha River Basin in Rule 62-304.500 F.A.C. Excessive nutrients are the primary pollutants contributing to the impairments. Tables 1 and 2 in the attached Exhibit 1 identifies the applicable TMDLs.

The Department worked closely with the affected stakeholders, including local and state agencies, in developing the 2019 BMAP amendments that were appropriate to further progress in achieving the Upper Ocklawaha River TMDLs. Beyond direct work with the affected stakeholders, the Department encouraged public participation to the greatest practicable extent by providing routine updates in technical meetings and requests for comment at technical meetings on the BMAP amendments. The Department held a noticed public meeting in the basin on April 19, 2018, to discuss the BMAP amendments and receive comments.

The 2019 BMAP amendments represent the collaborative effort of stakeholders to identify current and planned management actions to achieve pollutant load reductions required by the TMDLs. The adopted BMAP amendments update the management actions that have been, or will be, undertaken by stakeholders to reduce discharge of pollutants in the watershed. The management actions (completed, ongoing, and planned) identified in the 2019 BMAP amendments address known sources of pollutants, facilitate investigation of unknown sources, prevent new sources, and address future loads associated with population growth and land use changes in the basin.

The specific pollutant reduction projects and management actions required of individual entities are set forth in Chapter 4 and Appendix C of the 2019 BMAP amendments. Unless otherwise noted in the 2019 BMAP amendments, all requirements of the BMAP amendments are enforceable upon the effective date of this Order.

This Final Order and incorporated BMAP amendments are enforceable pursuant to sections 403.067, 403.121, 403.141, and 403.161, Florida Statutes.

THEREFORE, IT IS ORDERED that the attached Exhibit 1 is hereby adopted as the Upper Ocklawaha River Basin Management Action Plan Amendment.

NOTICE OF RIGHTS

The Upper Ocklawaha River Basin Management Action Plan Amendment shall become final unless a timely petition for an administrative proceeding is filed pursuant to the provisions of Sections 120.569 and 120.57 of the Florida Statutes, before the deadline for filing a petition. The procedures for petitioning for a hearing are set forth below.

A person whose substantial interests are affected by the Department's proposed agency action may petition for an administrative proceeding (hearing) under Sections 120.569 and 120.57 of the Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Department's Office of General Counsel, 3900 Commonwealth Boulevard, Mail Station 35, Tallahassee, Florida 32399-3000.

Petitions must be filed within 21 days of publication of the public notice or within 21 days of receipt of this order, whichever occurs first. Under Section 120.60(3), Florida Statutes, however, any person who asked the Department for notice of agency action may file a petition within 21 days of receipt of such notice, regardless of the date of publication. The failure of any person to file a

petition within the appropriate time period shall constitute a waiver of that person's right to request an administrative determination (hearing) under Sections 120.569 and 120.57 of the Florida Statutes, or to intervene in this proceeding and participate as a party to it. Any subsequent intervention (in a proceeding initiated by another party) will be only at the discretion of the presiding officer upon the filing of a motion in compliance with Rule 28-106.205, F.A.C.

A petition that disputes the material facts on which the Department's action is based must contain the following information:

(a) The name, addresses, and telephone number of each petitioner; the Department case identification number and the county in which the subject matter or activity is located;

(b) A statement of how and when each petitioner received notice of the Department action;

(c) A statement of how each petitioner's substantial interests are affected by the Department action;

(d) A statement of the material facts disputed by the petitioner, if any;

(e) A statement of facts that the petitioner contends warrant reversal or modification of the Department action;

(f) A statement of which rules or statutes the petitioner contends require reversal or modification of the Department action; and

(g) A statement of the relief sought by the petitioner, stating precisely the action that the petitioner wants the Department to take.

A petition that does not disputes the material facts on which the Department's action is based shall state that no such facts are in dispute and otherwise shall contain the same information as set forth above, as required by Rule 28-106.301, F.A.C.

Because the administrative hearing process is designed to formulate final agency action, the filing of a petition means that the Department's final action may be different from the position taken by it in this order. Persons whose substantial interests will be affected by any such final decision of the Department on the petition have the right to petition to become a party to the proceeding, in accordance with the requirements set forth above.

Mediation is not available for this proceeding.

A party who is adversely affected by this order has the right to seek judicial review under Section 120.68 of the Florida Statutes, by filing a notice of appeal under Rule 9.110 of the Florida Rules of Appellate Procedure with

the clerk of the Department in the Office of the General Counsel, Mail Station 35, 3900 Commonwealth Boulevard, Tallahassee, Florida, 32399-3000, and by filing a copy of the notice of appeal accompanied by the applicable filing fees with the appropriate district court of appeal. The notice of appeal must be filed within thirty days after this order is filed with the clerk of the Department.

DONE AND ORDERED this 23rd day of July, 2019, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL PROTECTION

Noah Valenstein
Secretary

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

FILED ON THIS DATE PURSUANT TO § 120.52, FLORIDA STATUTES, WITH THE DESIGNATED DEPARTMENT CLERK, RECEIPT OF WHICH IS HEREBY ACKNOWLEDGED.

Donna M. Etheridge 7/23/19
Deputy CLERK DATE

Upper Ocklawaha River Basin Management Action Plan Amendment

Division of Environmental Assessment and Restoration
Water Quality Restoration Program
Florida Department of Environmental Protection

with participation from the
Upper Ocklawaha River Basin Stakeholders

June 2019

2600 Blair Stone Road
Tallahassee, FL 32399-2400
https://floridadep.gov

Acknowledgments

This *Upper Ocklawaha River Basin Management Action Plan (BMAP) Amendment* was prepared as part of a statewide watershed management approach to restore and protect Florida's water quality. It was prepared by the Florida Department of Environmental Protection in coordination with the Upper Ocklawaha River Basin Working Group participants and stakeholders, listed below:

Upper Ocklawaha River Basin Working Group participants and stakeholders

Type of Organization/Entity	Name
Local Governments	Lake County Lake County Water Authority Lake County Soil and Water Conservation District Marion County Orange County Polk County Apopka Clermont Eustis Fruitland Park Groveland Howey-in-the-Hills Lady Lake Leesburg Mascotte Minneola Montverde Mount Dora Tavares Umatilla Winter Garden Ocoee Wildwood
Regional and State Agencies	St. Johns River Water Management District Florida Fish and Wildlife Conservation Commission Florida Department of Agriculture and Consumer Services Florida Department of Transportation, District 5 Florida Department of Environmental Protection – Central District Florida Department of Environmental Protection – Tallahassee Florida Department of Health in Lake County Florida Turnpike Enterprise Central Florida Expressway Authority

Type of Organization/Entity	Name
Other Interested Stakeholders	Agriculture Oklawaha Valley Audubon Society Andreyev Engineering B&H Consulting Applied Sciences BCI Engineering Boyle Engineering Brown and Caldwell Eustis Chamber of Commerce Green Consultants HCBassMasters Jones Edmunds PEAR Professional Engineering Consultants Unaffiliated Citizens Stormwater 360 Trout Lake Nature Center

For additional information on the watershed management approach in the Upper Ocklawaha River Basin, contact:

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List of Acronyms and Abbreviations

AGM	Annual Geometric Mean
BMAP	Basin Management Action Plan
BMP	Best Management Practice
BOD	Biochemical Oxygen Demand
BWG	Basin Working Group
CDS	Continuous Deflective Separation
CR	County Road
CRA	Community Redevelopment Area
DEP	Florida Department of Environmental Protection
EMC	Event Mean Concentration
ERD	Environmental Research and Design
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FFL	Florida Friendly Landscaping
FFP	Florida Food Products
FLUCCS	Florida Land Use, Cover, and Forms Classification System
F.S.	Florida Statutes
FWC	Florida Fish and Wildlife Conservation Commission
FWRA	Florida Watershed Restoration Act
FYN	Florida Yards and Neighborhoods
GIS	Geographic Information System
kg-TP/yr	Kilograms of TP Per Year
kg/yr	Kilograms Per Year
lbs-TP/yr	Pounds of Total Phosphorus Per Year
lbs/yr	Pounds Per Year
LCWA	Lake County Water Authority
mg/L	Milligrams Per Liter
MS4	Municipal Separate Storm Sewer System
NA	Not Applicable
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NSBB	Nutrient-Separating Baffle Box
NuRF	Nutrient Reduction Facility
OAWP	Office of Agricultural Water Policy (FDACS)
OCEPD	Orange County Environmental Protection Department
OSTDS	Onsite Sewage Treatment and Disposal Systems
PLRG	Pollutant Load Reduction Goal
PSA	Public Service Announcement
SAV	Submerged Aquatic Vegetation
SHS	State Highway System
SJRWMD	St. Johns River Water Management District

SR	State Road
SW	Stormwater
SWFWMD	Southwest Florida Water Management District
TBD	To Be Determined
TIGER	Topologically Integrated Geographic Encoding and Referencing
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
UF	University of Florida
UF–IFAS	University of Florida Institute of Food and Agricultural Sciences
WAV	Watershed Action Volunteers (Program)
WBID	Waterbody Identification (Number)
WQI	Water Quality Improvement
WWTF	Wastewater Treatment Facility
WWTP	Wastewater Treatment Plant

Executive Summary

The Phase 2 Upper Ocklawaha Basin Management Action Plan (BMAP) was adopted in 2014. That plan identified five priority waterbodies in the basin that would not meet their total maximum daily loads (TMDLs) without additional effort and stated as a goal the identification of additional management strategies for those waterbodies. The priority waterbodies are Trout Lake, Lake Carlton, Lake Harris, Palatlakaha River, and Lake Yale (**Figure ES-1**).

Watershed loadings for all impaired waterbodies listed in the Phase 1 and Phase 2 Upper Ocklawaha BMAPs were updated to reflect 2009 land use data and development inputs. The 2009 estimated loadings replace the previous BMAP estimates of future loading.

TMDLs were adopted in 2017 for Lake Denham, Lake Roberts, and Marshall Lake for total phosphorus (TP) and total nitrogen (TN). Lake Denham is in the Lake Harris Watershed, and Lake Roberts and Marshall Lake are in the Lake Apopka Watershed.

This Amendment presents the allocations or assignment of loading reductions for developed urban land uses and septic systems (within 200 meters of waterbodies) for the priority waterbodies and 2017 adopted TMDLs and suggests management actions that, when met, are expected to achieve the TMDLs. The document sets a deadline for achieving loading reductions for these waterbodies as no later than 2027, 20 years after the initial adoption of the BMAP.

The document also includes updated nutrient budgets based on 2009 land use coverage for the five nonpriority waterbodies: Lake Apopka, Lake Beauclair, Lake Dora, Lake Eustis, and Lake Griffin. These budgets include project loading reductions and education credits assigned through 2017 and account for the implementation of agricultural best management practices (BMPs) through 2017.

The focus of the Upper Ocklawaha BMAP is to reduce the loading of TP, which is the primary pollutant contributing to the impairment of the five priority waterbodies and 2017 adopted TMDLs. In Trout Lake, Lake Denham, Marshall Lake, Lake Roberts, and the Palatlakaha River, TN contributes to the problem, and biochemical oxygen demand (BOD) was also identified as a pollutant contributing to the impairment in the Palatlakaha River. Although the BMAP currently focuses exclusively on TP, the restoration activities under the BMAP are also expected to result in reductions in TN and BOD.

The 2007 and 2014 BMAPs remain in effect, except as specifically modified by this Amendment. The BMAP provides for phased implementation under Subparagraph 403.067(7)(a)1., Florida Statutes (F.S.), and this adaptive management process will continue until the TMDLs are met. The phased BMAP approach allows for incrementally reducing loadings through the implementation of projects, while simultaneously monitoring and conducting studies to better understand water quality dynamics (sources and response variables) in each impaired waterbody.

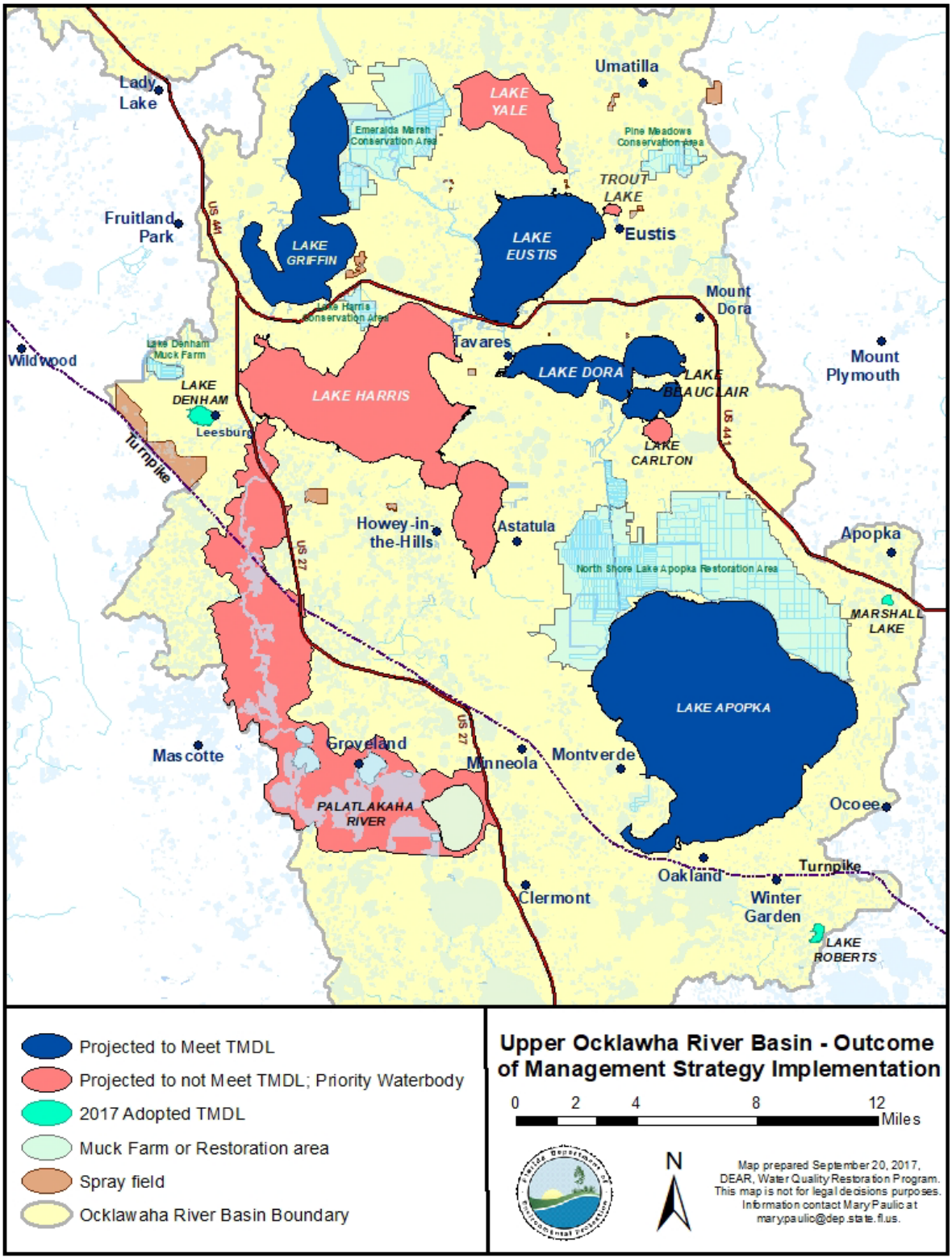

Figure ES-1. Location of impaired waterbodies

Updated Nutrient Source Budgets

Watershed loadings were recalculated, based on 2009 land use data and the number of septic systems, creating a revised baseline loading. **Appendix B** contains the detailed nutrient budgets. **Table ES-1** summarizes the revised loading numbers for Lake Harris, Palatlakaha River, Lake Carlton, Trout Lake, and Lake Yale. Each "Net Estimated Load" column indicates the net current loading after credits were subtracted for agricultural BMPs and the conversion of land from agriculture to other uses. Agricultural BMPs were assigned a loading reduction efficiency of 30 % applied to the number of acres covered by notices of intent (NOIs) for each commodity as of December 31, 2017.

The efficiency of 30 % for agricultural BMPs was considered appropriate based on work completed in the Northern Everglades Basin for surface water–dominated systems where the primary source of agricultural pollution is runoff. Loadings from golf courses were included with the source loading category "Other Agriculture" for calculation purposes but were listed as a separate source for tracking project implementation. The net estimated loads for developed land uses were allocated to local entities as summarized in **Tables ES-4** through **ES-8**. Credits for stormwater projects and education activities are also accounted for in these tables.

Table ES-2 summarizes the revised loading numbers for Lakes Apopka, Beauclair, Dora, Eustis, and Griffin. Each "Net Estimated Load" column indicates the net current loading after credits were subtracted for agricultural BMPs, the conversion of land from agriculture to other uses, and stormwater BMPs for developed land. Loadings from golf courses were listed as a separate source from the "Other Agriculture" category for tracking project implementation. Reductions for developed land stormwater BMP projects and education projects through December 2017 were included.

The revised loading numbers for these lakes indicate that they will meet their TMDLs, because net estimated TP loadings based on 2009 land uses are lower than the TMDLs. The allocation of loading reductions for these lakes was made to each watershed and, because these nutrient budgets indicate that the TMDLs will be met, individual project credits were not assigned by jurisdiction.

Table ES-1. Revised TP source loading (pounds of TP per year [lbs-TP/yr]) summary for priority waterbodies: Lake Harris, Palatlakaha River, Lake Carlton, Trout Lake, and Lake Yale

Note: Stormwater project credits and septic system credits are not included. Agriculture BMP credits were included in the Net Estimated Load from Agricultural Stormwater Runoff. Summary of source information calculated for watershed loads does not include in-lake loading.

Sources of TP	Lake Harris Net Estimated Load	Palatlakaha River Net Estimated Load	Lake Carlton Net Estimated Load	Trout Lake Net Estimated Load	Lake Yale Net Estimated Load
Spring Discharge	2,047				
Muck Farm Discharges	1,827			455	
Restoration Area Discharges	-1			540	
Atmospheric Deposition	5,422		118	30	1,443
Lake Eustis Discharge	84				
Palatlakaha River Discharge	4,586				
Point Source	1				
Natural Area Stormwater Runoff	2,253	1,049	69	382	610
Agricultural Stormwater Runoff	463	397	91	68	351
Golf Course Stormwater Runoff	13				
Developed Uses Stormwater Runoff	3,295	1,306	121	514	693
Seepage/Groundwater		27			
Septic Systems Total	2,190		70	7	586
Septic Systems	1,515		54	7	191
Package Plants	675		16		394
Loading Information					
Net TP Loading	**22,180**	**2,779**	**469**	**1,996**	**3,682**
TMDL	**18,302**	**2,207**	**195**	**521**	**2,844**
Required TP Loading Reduction to Meet TMDL	**3,878**	**572**	**274**	**1,475**	**838**

Table ES-2. Revised net TP source loading (lbs-TP/yr) for nonpriority waterbodies: Lakes Apopka, Beauclair, Dora, Eustis, and Griffin

Note: Stormwater project, education credits, and agricultural BMP credits through December 2017 were applied.
* Lake Apopka models did not separate stormwater runoff into natural, agricultural, and developed areas. Summary of source information calculated for watershed loads does not include in-lake loading.

Sources of TP	Lake Apopka Net Estimated Load	Lake Beauclair Net Estimated Load	Lake Dora Net Estimated Load	Lake Eustis Net Estimated Load	Lake Griffin Net Estimated Load
Spring Discharge	2,208				
Muck Farm Discharge		1,702		175	
Restoration Area Discharges					
Apopka Restoration Area	11,895				
Pine Meadows Restoration Area				475	
Harris Bayou					423
Emeralda Marsh Restoration Area					4,653
Atmospheric Deposition	13,645	311	1,267	2,251	3,816
Tributary Inflows					
Lake Apopka Discharge		2,774			
Lake Beauclair Discharge			4,428		
Lake Dora Discharge		6		3,074	
Lake Eustis Discharge			13		7,884
Lake Harris Discharge				4,023	
Lake Yale Discharge					2
Point Sources	2,671		1	15	
Stormwater Runoff	-1,348*				
Natural Areas Runoff		324	245	992	1,688
Agricultural Runoff		346	38	166	332
Golf Course Stormwater Runoff		10	4	7	7
Stormwater Runoff Developed		7	-31	-1,062	1,823
Septic Systems		178	445	1,391	1,006
Package Wastewater Treatment Plants (WWTPs)		83		910	1,644
Margin of Safety	1,168				
Loading Information					
Baseline TP Loading	**138,497**	**46,681**	**39,829**	**35,174**	**78,474**
Expected Reduction in TP Loading	**108,258**	**40,940**	**33,419**	**22,757**	**55,196**
Net Expected TP Loading	**30,239**	**5,741**	**6,410**	**12,417**	**23,278**
TMDLs	**35,052**	**7,056**	**13,230**	**20,286**	**26,901**

Nutrient Sources for 2017 Adopted TMDLs

Table ES-3 summarizes the sources of nutrient loading for Lake Roberts, Lake Denham, and Marshall Lake. The TMDLs developed for these waterbodies integrated 2004 and 2009 land use data. Discharges from an historical muck farm area and internal recycling are substantial sources of TP loading for Lake Denham. Lake Roberts and Marshall Lake receive large contributions of loading from stormwater and groundwater seepage and septic systems. Nutrient loads from sediment or nitrogen-fixing cyanobacteria sources were not incorporated in the derivation of the TMDLs for Marshall Lake and Lake Roberts.

Table ES-3. TP source loading (kilograms of TP per year [kg-TP/yr]) summary for 2017 adopted TMDLs: Lake Roberts, Lake Denham, and Marshall Lake

NA = Not applicable.
* TMDLs did not include loading from benthic sediments or nitrogen-fixing cyanobacteria.

Sources of TP	Lake Roberts TMDL Baseline Loading (2000–12)	Lake Denham TMDL Baseline Loading (2000–12)	Marshall Lake TMDL Baseline Loading (2000–12)
Atmospheric Deposition (Wet/Dry)	17	35	18
Stormwater Runoff	66	1,136	224
Natural Area Runoff	30	380	9
Agricultural Runoff	3	106	44
Developed Uses Runoff	33	149	171
Muck Farm	NA	500	NA
Seepage/Groundwater/Septic Systems	56	7	68
Internal Load	*	326	*
Baseline and Net TP Loading	**139**	**1,504**	**310**
TMDL	**100**	**593**	**97**
Required TP Loading Reduction to Meet TMDL	**39**	**911**	**213**

Progress Towards Meeting Loading Reductions

The developed land use loading attributed to a jurisdiction is proportional to the area and type of source loadings found within that jurisdiction's boundary. A jurisdiction's percent contribution of the area of a land use loading category was multiplied by the overall proportional reduction for that land use category defined in each TMDL. The product of that calculation is the portion of the overall proportional reduction assigned to that jurisdiction for that land use category and is represented as the first column in summary **Tables ES-4** through **ES-11**. Adjustments may need to be made to a jurisdiction's overall proportional reduction as a result of increased land area from the annexation of land into the jurisdiction. Any required adjustments or revisions will be addressed during the annual BMAP review process.

For all waterbodies, implementation activities to reduce TP loadings and achieve the TMDLs must be completed by the end of 2027. Overall loading reductions assigned to a jurisdiction are

the sum of reductions for developed land and, where present, septic systems within 200 meters of a waterbody shoreline or tributary shoreline. The loading reduction is expected to occur throughout the 10-year period, with specific targets for developed land uses for each 5-year period. The loading reduction assigned to septic systems is to be achieved by 2027, though that reduction does not have to be specifically targeted towards septic systems. Currently, there is no regulatory framework to induce property owners, developers, jurisdictions, or other stakeholders to switch from onsite septic systems to sanitary sewer systems.

Project credits are cumulative since the adoption of the Phase 1 BMAP. **Appendix C** lists new projects not previously adopted. Examples of projects given credit for loading reductions include structural BMPs, street sweeping, swale maintenance and BMP cleanout, baffle boxes, cessation of fertilizer use on Florida Department of Transportation (FDOT)–maintained medians and rights-of-way, and education outreach activities.

Education credits are assigned to the first 5-year period, and only if additional educational activities are undertaken will credits be added to the second 5-year period. Education credits calculated as less than 0.5 kg-TP/yr or lbs-TP/yr are represented in the watershed summary tables as 0. Education credits calculated between 0.5 and 1.0 kg-TP/yr or lbs-TP/yr are represented in the TMDL summary tables as 1. The 2017 adopted TMDLs estimate loadings in kilograms, while the other TMDLs in the basin estimate loadings in pounds.

The Florida Department of Agriculture and Consumer Services (FDACS) began operating a hybrid wetland treatment system to treat water in Hicks Ditch before discharging into Trout Lake. Hicks Ditch drains an historical agricultural area (muck farm). The land where the facility is located is leased from the City of Eustis. It is anticipated that this facility will prevent more than 2,200 lbs-TP/yr from entering Trout Lake and that the reduction will also benefit Lake Eustis.

The Lake County Water Authority (LCWA) proposes to purchase an historical agricultural area (muck farm) that is a major loading source for Lake Denham. The cessation of discharges from the property will reduce loading into Lake Denham by 500 kg-TP/yr and remove loading from Lake Harris. LCWA is evaluating all-lake alum treatment for Lake Yale to reduce TP loading.

LCWA and Orange County Environmental Protection Division (OCEPD) have partnered to conduct a hydrological and nutrient source assessment on Lake Carlton through a mutual contractor. This investigation is intended to quantify sources of nutrient pollutant loading and to characterize the hydrology in the watershed. The report will contain a water quality improvement plan available to stakeholders and other interested parties. Lake Carlton is located in the northwest corner of Orange County, and Lake and Orange Counties share jurisdiction.

OCEPD contractors are conducting two additional investigations to help characterize the transport of nutrient pollutant loads in the Upper Ocklawaha BMAP area. In addition to Lake Carlton, assessments are underway within the following segments with waterbody identification (WBID) numbers: Black Lake (WBID 2875A), Lake Roper (WBID 2875C), Lake Tilden (WBID

2875B), and Lake Pearl (west) (WBID 2872B). The results of these investigations are intended to identify sources and sinks of nutrient pollutant loads in the watersheds. The investigations will produce a list of ranked BMPs that can be implemented should the required resources (e.g., availability of land for construction, stakeholder willingness, funding mechanisms, etc.) become available.

In some basins, individual jurisdictions contribute less than 1 % of the total developed loading attributed to land use. The contribution to overall nutrient loading is low enough that reductions from these areas would have essentially no significant impact on the required reductions for this phase of the BMAP; therefore, these entities are considered a low priority for implementing reductions. Local governments that met the low-priority classification include the City of Wildwood in the Lake Harris Watershed and the City of Mascotte and the Florida Turnpike Enterprise in the Palatlakaha Watershed. These entities have controls in place to manage nutrients, either through a municipal separate storm sewer system (MS4) permit for stormwater or, in the case of Wildwood, a consumptive use permit from the Southwest Florida Water Management District (SWFWMD). These entities are not required to reach reduction targets during the first 5 years.

Table ES-4. Palatlakaha River required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reductions to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Developed Land Use Reductions to Be Achieved by 2027
Clermont	15	8	1	359	**0**	7	**0**
Groveland	119	60	8	15	**37**	59	**96**
Lake County	245	123	53	12	**57**	122	**180**
Leesburg	30	15	5	0	**10**	15	**25**
Mascotte	1	1	0	0	**1**	0	**1**
Minneola	24	12	1	2	**9**	12	**21**
Florida Turnpike Enterprise	4	2	0	0	**2**	2	**4**
FDOT	9	5	0	1,487	**0**	4	**0**
Total	**447**	**226**	**68**	**1,875**	**116**	**221**	**327**

Table ES-5. Lake Harris required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
Astatula	40	20	0	0	**20**	20	40	25	**65**
FDOT	47	24	1	1,207	**0**	23	0		**0**
Howey-in-the-Hills	22	11	1	11	**-1**	11	10	42	**52**
Lake County	386	193	88	205	**-99**	193	94	402	**496**
Leesburg	390	195	75	37	**84**	195	279	1	**280**
Tavares	148	74	8	10	**56**	74	130	5	**135**
Wildwood	2	1	0	0	**1**	1	1		**2**
Total	**1,035**	**517**	**172**	**1,469**	**61**	**517**	**554**	**475**	**1,030**

Table ES-6. Lake Carlton required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
FDOT	16	8	0	207	**0**	8	0	0	**0**
Lake County	12	6	1	3	**2**	6	8	25	**33**
Orange County	90	45	6	0	**39**	45	85	28	**112**
Total	**118**	**59**	**7**	**210**	**41**	**59**	**93**	**53**	**145**

Table ES-7. Trout Lake required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reduction, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5- Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5- Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
Eustis	212	106	14	199	**-107**	106	-1	1	**0**
FDOT	29	15	0	531	**0**	14	0	0	**0**
Lake County	72	36	4	143	**-111**	36	-75	6	**0**
Umatilla	166	83	10	106	**-33**	83	50	0	**50**
FDACS				2,015					**0**
Total	**479**	**240**	**28**	**2,994**	**-140**	**239**	**49**	**7**	**50**

Table ES-8. Lake Yale required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reduction, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
Eustis	119	60	14	2	**44**	59	103	4	**107**
FDOT	24	12	0	475	**0**	12	0	0	**0**
Lake County	184	92	20	15	**57**	92	149	95	**244**
Marion County	8	4	1	0	**3**	4	7	0	**7**
Umatilla	24	12	3	6	**3**	12	15	0	**15**
Total	**359**	**180**	**38**	**498**	**107**	**179**	**274**	**99**	**373**

Table ES-9. Lake Denham required reductions and credits (kg-TP/yr) by jurisdiction

* If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027
FDOT	6	3	0	0	**3**	3	**6**
Lake County	26	13	2	0	**11**	13	**24**
Leesburg	91	46	7	0	**39**	45	**85**
Wildwood	3	1	0	0	**1**	2	**3**
Muck Farm–LCWA	421	210	0	500	**0**	211	**0**
Total	**547**	**273**	**9**	**500**	**54**	**273**	**118**

Table ES-10. Marshall Lake required reductions and credits (kg-TP/yr) by jurisdiction

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction to Be Achieved by 2022	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027
Apopka	135	67	7	0	**60**	68	**128**
Orange County	23	11	1	0	**10**	11	**21**
FDOT	7	4	0	0	**4**	4	**8**
Central Florida Expressway Authority	15	8	0	2	**6**	7	**13**
Total	**180**	**91**	**8**	**2**	**80**	**90**	**170**

Table ES-11. Lake Roberts required reductions and credits (kg-TP/yr) by jurisdiction

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction to Be Achieved by 2022	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027
Orange County	24	12	1	0	**11**	12	**22**
Winter Garden	14	7	1	0	**6**	7	**13**
Total	**38**	**19**	**2**	**0**	**17**	**19**	**35**

Chapter 1: Context, Purpose, and Scope of the Plan

1.1 Scope, Purpose, and Priority Waters

The Phase 2 Upper Ocklawaha Basin Management Action Plan (BMAP) was adopted in 2014.[1] That plan identified five priority waterbodies in the basin that would not meet their total maximum daily loads (TMDLs) without additional effort and stated as a goal the identification of additional management strategies for those waterbodies. The priority waterbodies are Trout Lake, Lake Carlton, Lake Harris, Palatlakaha River, and Lake Yale (**Figure 1**).

This Amendment presents the allocations or assignment of loading reductions for developed urban land uses and septic systems for these priority waterbodies and suggested management actions that, when met, are expected to achieve the TMDLs. The document sets a deadline for achieving loading reductions for these waterbodies as no later than 2027, 20 years after the initial adoption of the BMAP. The reductions for developed land uses are split into two 5-year periods, each with a specified reduction target. Septic systems have a 10-year reduction target.

Watershed loadings for all impaired waterbodies listed in the Phase 1 and Phase 2 Upper Ocklawaha BMAPs were updated to reflect 2009 land use data and development inputs. The 2009 estimated loadings replace the previous BMAP estimates of future loading. The apportionment of loading reductions for the priority waterbodies is based on 2009 land use loading estimates.

This document also includes updated nutrient budgets based on 2009 land use for the nonpriority waterbodies: Lake Apopka, Lake Beauclair, Lake Dora, Lake Eustis, and Lake Griffin. These budgets include project loading reductions and education credits assigned through 2017. In addition, it introduces and allocates reductions for three waterbodies with TMDLs adopted in 2017 for total phosphorus (TP) and total nitrogen (TN): Lake Denham, Lake Roberts, and Marshall Lake. Lake Denham is in the Lake Harris Watershed, and Lake Roberts and Marshall Lake are in the Lake Apopka Watershed. The same deadline of 2027 for achieving reductions is set for the 2017 adopted TMDLs.

The 2007 and 2014 BMAPs remain in effect, except as specifically modified by this Amendment. The BMAP provides for phased implementation under Subparagraph 403.067(7)(a)1., Florida Statutes (F.S.), and this adaptive management process will continue until the TMDLs are met. The phased BMAP approach allows for incrementally reducing loadings through the implementation of projects, while simultaneously monitoring and conducting studies to better understand water quality dynamics (sources and response variables) in each impaired waterbody.

[1] http://www.dep.state.fl.us/water/watersheds/bmap.htm

1.2 Background

TMDLs for four priority waterbodies were adopted in 2003 and for Trout Lake in 2006 based on loading estimates derived from 1995 land use. **Table 1** lists these TMDLs and required reductions. The Lake Denham, Marshall Lake, and Lake Roberts TMDLs were based on nutrient loading derived from 2004 and 2009 land use data. **Table 2** lists these TMDLs and required reductions.

Watershed loadings for all impaired waterbodies listed in the Phase 1 and Phase 2 Upper Ocklawaha BMAPs were updated to reflect 2009 land use data and development inputs. The 2009 estimated loadings replace the previous BMAP estimates of future loading. The revised land use loading estimates replace the baseline loading values presented in the Phase 1 and Phase 2 BMAPs. The TMDL targets are the same as when adopted.

The Upper Ocklawaha BMAP focuses on reducing the loading of TP, which is the primary pollutant contributing to the impairment of the five priority waterbodies and the 2017 adopted TMDLs. In Trout Lake, Lake Denham, Marshall Lake, Lake Roberts, and the Palatlakaha River, TN contributes to the problem, and biochemical oxygen demand (BOD) was also identified as a pollutant contributing to the impairment in the Palatlakaha. Although the BMAP currently focuses exclusively on TP, the restoration activities under the BMAP are expected to also result in reductions in TN and BOD. Future efforts to restore water quality focused on TN load reductions may still be needed.

1.3 Pollutant Reduction Allocations

Allocations of TP loading reductions for developed land uses were calculated for individual municipalities, the Florida Department of Transportation (FDOT), Florida Turnpike Enterprise, and Central Florida Expressway Authority for the priority waterbodies and 2017 TMDLs. The loading reduction allocated to agricultural lands is addressed through enrollment and implementation of best management practices (BMPs), which is administered by the Florida Department of Agriculture and Consumer Services (FDACS) Office of Agricultural Water Policy (OAWP).

TMDLs for Lake Denham, Lake Roberts, and Marshall Lake were adopted in 2017, and with this Amendment are added to the Upper Ocklawaha BMAP. Loading reductions for these lakes were calculated and assigned to local governments using techniques similar to those used for the priority waterbodies and are adopted with this document.

The loading reductions for the remaining waterbodies covered by the Upper Ocklawaha BMAP (Lakes Griffin, Eustis, Beauclair, Dora, and Apopka) continue to be allocated to each lake's watershed and not specific municipalities. These waterbodies are expected to meet their TMDLs without targeting specific jurisdictions and assigning reductions.

However, the loading reductions achieved for four priority waterbodies—Trout Lake, Lake Harris, Lake Carlton, and Lake Yale—will contribute to overall loading reductions for Lake

Eustis, Lake Beauclair, and Lake Griffin by reducing the tributary inputs of loading. Lake Griffin and Lake Apopka are also the target of extensive watershed and in-lake water quality restoration efforts by the St. Johns River Water Management District (SJRWMD) and to a lesser extent the Florida Fish and Wildlife Conservation Commission (FWC).

1.4 Stakeholder Involvement

Throughout the development of loading reductions, local stakeholders have been engaged in the process. Their input informed and shaped the direction taken by the Florida Department of Environmental Protection (DEP) in allocating loading reductions. The first public meeting to discuss the allocation approach was held on February 25, 2015. Six additional public meetings/workshops were held (May 28, 2015; September 10, 2015; November 20, 2015; January 29, 2016; September 8, 2016; and March 16, 2017) to solicit comments from all interested parties, disseminate information, and allow for public discussion. The public meetings were formally noticed in the *Florida Administrative Register*. Technical discussions were held (May 5, 2015; May 19, 2015; July 10, 2015; October 22, 2015; November 12, 2015; December 4, 2015; December 15, 2015; March 8, 2016; and April 13, 2016) between each public meeting to review issues, considerations, and technical details. A public meeting to present the Amendment and receive public comment was held on August 29, 2017, and a second public meeting to present the final Amendment was held on April 19, 2018.

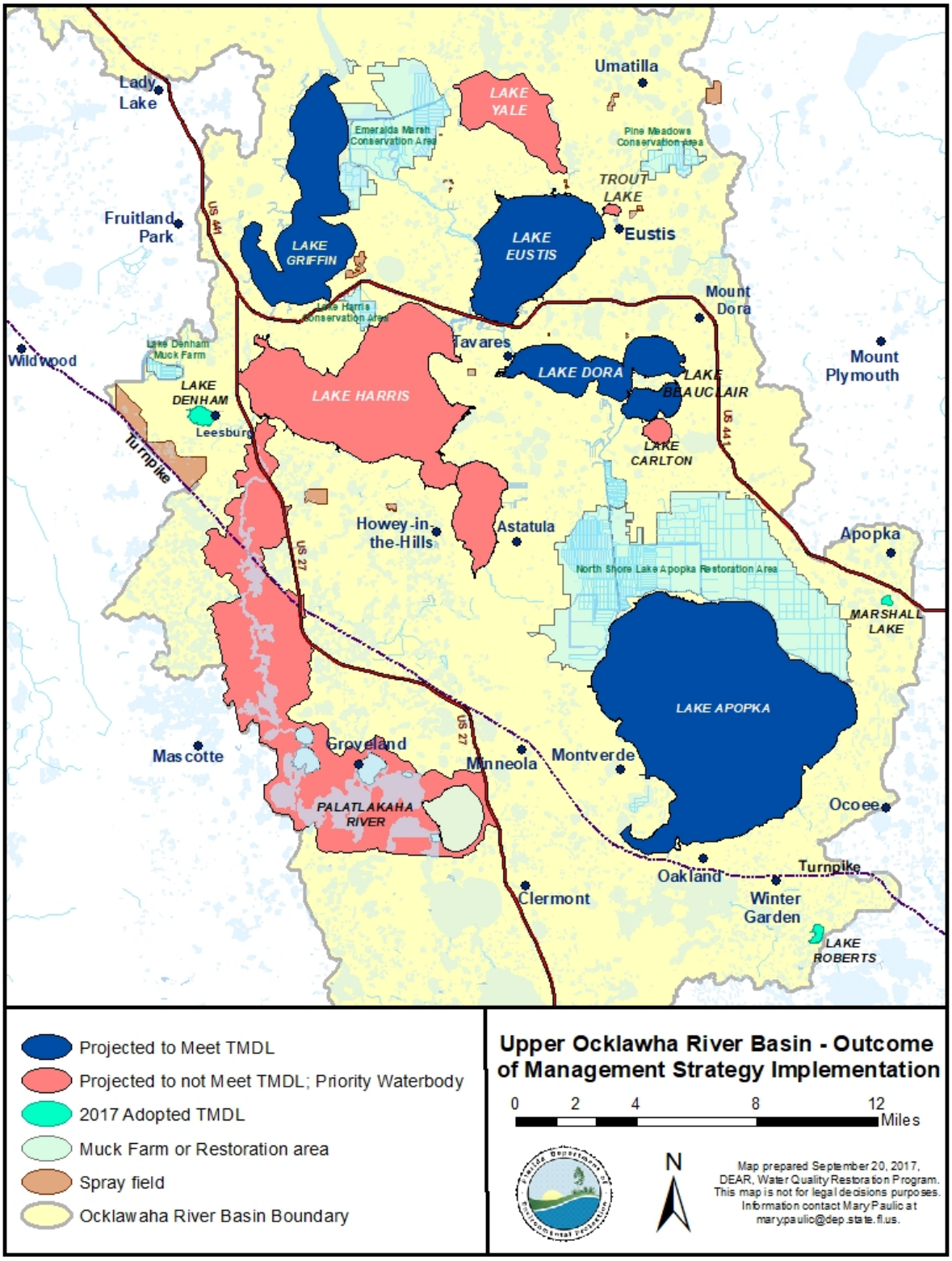

Figure 1. Location of impaired waterbodies

Table 1. Priority waterbody TMDLs with loading and TP concentration targets

WBID = Waterbody identification; lbs/yr = Pounds per year; mg/L = Milligrams per liter; NPDES = National Pollution Discharge Elimination System; NA = Not applicable

Waterbody	WBID Number	Parameter	TMDL (lbs/yr)	Target Concentration (mg/L)	TMDL Net Load with 2009 Land Use (1991–2000) (lbs/yr)	Wastewater Wasteload Allocation (lbs/yr)	NPDES Stormwater Wasteload Allocation (% reduction)	Load Allocation (nonpoint) (lbs/yr)	Overall Needed Reduction (lbs/yr)
Lake Carlton	2837B	TP	195	0.032	478	NA	59	195	**283**
Trout Lake	2819A	TP	521	0.028	2,076	NA	80	521	**1,476.5**
Trout Lake	2819A	TN	9,733	0.78	33,371	NA	60	9,733	**14,432**
Lake Harris/ Little Lake Harris	2838A, 2828B, 2832, 2817C	TP	18,302	0.026	22,192	NA	32	18,302	**3,890**
Palatlakaha River	2839	BOD	43,042	None	49,351	NA	12.8	43,042	**6,309**
Palatlakaha River	2839	TN	16,696	None	19,683	NA	5.2	16,696	**908**
Palatlakaha River	2839	TP	2,207	None	2,796	NA	6.1	2,207	**589**
Lake Yale	2807A, 2807	TP	2,844	0.02	3,692	NA	10	2,844	**848**

Table 2. Lake Denham, Lake Roberts, and Marshall Lake TMDLs with loading and nutrient concentration targets

kg/yr = Kilograms per year; AGM = Annual geometric mean; NA = Not applicable

Waterbody	WBID Number	Parameter	TMDL (kg/yr)	Target Concentration AGM (mg/L)	TMDL Baseline Load (2000–12) (kg/yr)	Wastewater Wasteload Allocation (kg/yr)	NPDES Stormwater Wasteload Allocation (% reduction)	Load Allocation (nonpoint) (% reduction)	Overall Needed Reduction (kg/yr)
Lake Denham	2832A	TP	593	0.04	1,504	NA	61	61	**911**
Lake Denham	2832A	TN	16,468	1.10	42,755	NA	61	61	**26,287**
Marshall Lake	2854A	TP	97	0.037	310	NA	69	69	**213**
Marshall Lake	2854A	TN	2,046	0.90	3,136	NA	35	35	**1,090**
Lake Roberts	2872A	TP	100	0.044	139	NA	28	28	**39**
Lake Roberts	2872A	TN	1,655	1.02	1,975	NA	16	16	**320**

Chapter 2: TP Loading Updates and Data Sources

TMDLs for the Upper Ocklawaha Basin were adopted in 2003 and for Trout Lake in 2006.[2] With exceptions for Trout Lake, Lake Carlton, and the Palatlakaha River, these TMDLs were based on pollutant load reduction goals (PLRGs) developed by SJRWMD (Fulton et al. 2004). DEP developed the Trout Lake TMDL using a similar modeling approach, and in 2016 revised the watershed loading calculation using the same methodology as for PLRG development. The Lake Carlton TMDL was developed using the same loading methodology and target concentrations that SJRWMD used for Lake Beauclair.

This chapter describes the adjustments and updates made in revising the watershed loading calculations. Growth and shifts in development patterns necessitated corrections in watershed loading estimates and the distribution of that loading before loading reductions were allocated to local governments.

2.1 TP Loading Updates for 2003 Adopted TMDLs

Land use data mapped from 1995 aerial photography were used to develop the TMDLs in the Upper Ocklawaha Basin, except for the Palatlakaha River, which used a created dataset that estimated 1991 land use. The Phase 1 BMAP provided an estimate of anticipated loading from future growth and added it to the TMDL model calculation of baseline loading, creating a revised starting load. The difference between the TMDL loading target and the starting load was the total reduction needed to meet the TMDLs.

Local governments raised concerns that this approach overestimated the necessary loading reduction, primarily because anticipated growth had not occurred since the adoption of the Phase 1 BMAP in 2007 and may not occur. Additionally, the past 20-year pattern of land use development may be different from what was mapped in 1995. Watershed loadings were recalculated based on 2009 land use data and the number of septic systems, creating a revised baseline loading.

2.1.1 Land Use Loading Revisions

Adjustments were made to the calculation of watershed loadings derived from urban and agricultural land uses for each of the 10 adopted TMDL waterbodies listed in the Upper Ocklawaha BMAP using 2009 land use data (outlined in **Figure 2**). This only affects the baseline or starting load for each TMDL. The baseline period is the data range used for the development of the TMDLs. It does not change the TMDL loading target (**Table 1**) or target concentration of nutrients needed to meet water quality criteria.

Land use data were created from the interpretation of 2009 color infrared aerial photography interpreted by SJRWMD and used as the basis for the development of loading estimates.

[2] http://www.dep.state.fl.us/water/tmdl/final_tmdl.htm

Features on the ground are assigned a classification defined by the Florida Land Use, Cover, and Forms Classification System (FLUCCS). Mapped land uses are frequently more detailed than the modeling data used to support the calculation of loading estimates. Land use classifications are grouped into categories as defined in the adopted TMDLs, and loadings are calculated for each category.

Only the acreage of different land use types was adjusted for calculation. All other modeling coefficients used in the TMDLs to estimate watershed land use loading were maintained. The amount of atmospheric deposition (rainfall and dry fall), pattern of deposition, and hydrology were kept the same as the TMDL baseline period. Inputs from springs, active muck farms, upstream tributary contributions, or other direct inputs were also kept the same.

Septic system contributions, when included in watershed loading estimates, represent septic systems located within 200 meters of the waterbody shoreline or the tributary discharging to the waterbody. SJRWMD estimated the number of systems based on counts taken from 2009 aerial photography, including package plants (treated as the estimated number of houses with septic systems) that do not discharge directly to the waterbody.

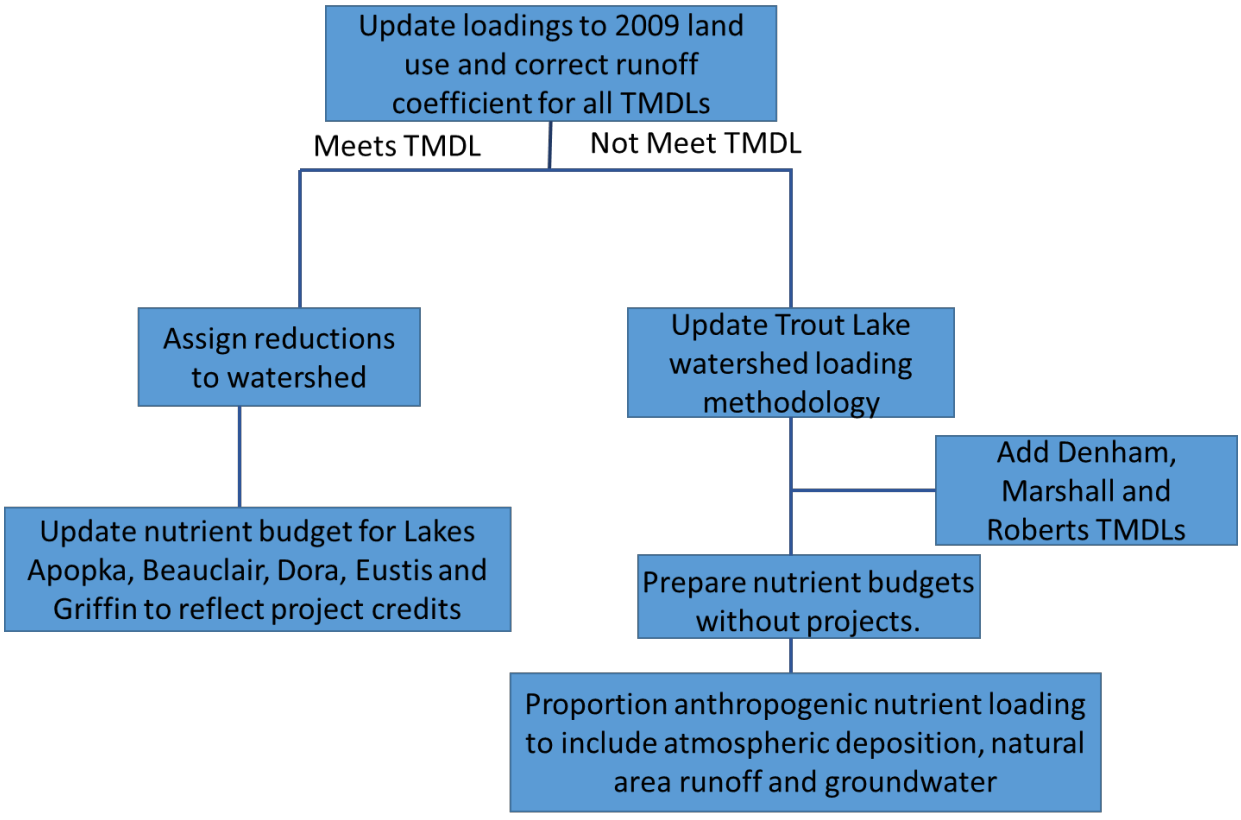

Figure 2. Decision matrix

2.1.2 Trout Lake Modeling Refinement

The method used for estimating the watershed loading for Trout Lake was refined and updated to the approach used for Lake Eustis (Fulton et al. 2004; Magley 2003). Trout Lake is a tributary of Lake Eustis. This modified approach does not change the TMDL target loadings or the concentration of nutrients needed to meet water quality standards and criteria. Land use data were more finely detailed and aggregated in the same manner as Lake Eustis, with distance from the lake considered in the delivery of loading to Trout Lake. The number of land use categories used for loading estimates was increased from 9 to 17. Soil moisture conditions were included as a factor influencing the delivery of loading.

These adjustments allow the direct comparison of results for Trout Lake with those for other impaired lakes and facilitates the tracking of annual loading inputs and changes to the lake compared with other waterbodies. The difference between methods of estimating loading was 8 %.

2.2 Agricultural BMP Reductions

Table 3 summarizes the agricultural acreage under notices of intent (NOIs) to implement BMPs and provides estimated loading reductions from the NOIs. Acreage numbers reflect land use modeled as agriculture in each TMDL watershed. Part of the acreage included with an NOI is not typically considered agricultural land use. The loading from lands covered by an NOI was calculated from the total agricultural loading as the proportion of the land under an NOI out of the total agricultural acreage modeled.

Agricultural BMPs were assigned a loading reduction efficiency of 30 % applied to the number of acres covered by NOIs as of December 2017. The efficiency of 30 % for agricultural BMPs was considered appropriate based on work completed in the Northern Everglades Basin for surface water–dominated systems where the primary source of agricultural pollution is runoff.

Loadings from golf courses were included with loadings from the model category "Other Agriculture," except for the Palatlakaha River. **Table 3** includes an estimate of loading from golf courses. A different set of BMPs is appropriate for golf courses. Loading reductions calculated for the implementation of agricultural BMPs were corrected to account for golf course loadings.

NOIs cover more acreage in the Upper Ocklawaha Basin than was modeled for the TMDLs for impaired waterbodies because parts of the larger Upper Ocklawaha Basin are covered by NOIs that are not part of the surface drainage of impaired waterbodies. Overall 15,186 acres are covered by NOIs identified as agriculture from 2009 land use data. Additional acreage in the basin may be under NOIs but is not accounted for in the total modeled acreage—possibly because land use may have transitioned to agriculture from nonagricultural land use since 2009, or was not correctly classified in the 2009 land use data, and as such is not reflected in the total acreage covered by NOIs.

FDACS is revising the methods and data sources used to estimate active agricultural acreage in the Upper Ocklawaha Basin. Future annual reviews will address this issue, and updates to this document will reflect any necessary adjustment.

Table 3. Summary of agricultural acreage covered by NOIs

NA = Not applicable.
[1] Total agricultural acreage does not include golf course acreage.
[2] Additional 409 acres under historical muck farm category covered by NOIs for sod and nursery.

Watershed	Total/ Modeled Agricultural Acres[1]	Total/ Modeled Acres Covered by NOIs	Reduction in Loading from NOIs (lbs-TP/yr)	Reduction in Loading from Conversion to Non-agricultural (lbs-TP/yr)	Acres of Golf Courses	Estimated Loading from Golf Courses (lbs-TP/yr)
Lake Apopka	12,521	2,591	NA	NA	1,756	NA
Lake Beauclair	1,753[2]	334[2]	32	NA	51	10
Lake Dora	635	113	3	NA	72	4
Lake Eustis	879	62	3	NA	81	7
Lake Griffin	4,916	521	12	NA	96	7
Lake Carlton	926	269	9	NA	NA	NA
Trout Lake	1,562	208	2	NA	NA	NA
Lake Harris	7,109	942	9	3	194	13
Lake Yale	4,152.6	704	10	NA	NA	NA
Palatlakaha River (WBID 2839)	6,020	826	17	NA	Not modeled	NA
Entire Palatlakaha River (includes WBID 2839)	39,502	5,568	NA	NA	NA	NA
Remaining Upper Ocklawaha Basin	25,915	3,873	NA	NA	606	NA

2.3 Revised Nutrient Budgets

Land use categories were further aggregated and simplified in the presentation of nutrient budgets. **Table 4** lists the aggregation of land use loading estimates used for nutrient budgets. Lake Apopka's watershed loading estimates do not distinguish between stormwater generated from developed areas and agricultural activities. The Palatlakaha River TMDL used a more simplified accounting of land uses that included only one category for agriculture and four categories for developed areas, with a separate category for transportation, communication, and utilities.

Table 5 summarizes the revised loading numbers for Lake Apopka, Lake Beauclair, Lake Dora, Lake Eustis, and Lake Griffin. The first column indicates the net current loading after credits for agricultural BMPs and developed land stormwater BMPs were subtracted. Project reductions for developed land with stormwater BMPs through December 2017 were included.

The second column for each waterbody lists the net change in loading by source category that has occurred, adjusted for changes from the 2009 land use coverage. The revised loading numbers for these lakes indicate that they will meet their TMDLs. Net estimated TP loadings based on 2009 land uses are lower than the TMDLs. The allocation of loading reductions for these lakes was made to each watershed and, because these nutrient budgets indicate that the TMDLs will be met, individual project credits were not tracked by jurisdiction.

The nutrient budgets for these lakes include reductions for projects that were implemented and continue to be maintained by FDOT and local governments to reduce stormwater loadings from developed land. There are instances where the credit reductions calculated are larger than the modeled developed land surface runoff; this may result from overestimates of project area or the inability to separate natural land loadings from developed land loadings.

FDACS continues to enroll producers under NOIs for appropriate BMPs. The benefits of loading reductions from projects in an upstream waterbody are carried through to downstream waterbodies for these lakes. For example, nutrient loading reductions for projects implemented in the Lake Eustis Basin reduce the load of nutrients that are delivered and accounted for in Lake Griffin. Projects implemented in the Lake Carlton Watershed also provide loading reductions to Lake Beauclair.

Table 6 summarizes the revised loading numbers for the priority waterbodies updated to reflect the 2009 land use coverage. **Appendix B** contains detailed budgets. The nutrient source summaries created for the priority waterbodies removed credits for urban stormwater projects, allowing loading reductions from developed stormwater sources to be allocated to local jurisdictions, FDOT, Turnpike Enterprise Authority, and FDACS.

The budgets for Trout Lake and Lake Harris include loading reductions expected from historical agricultural land restoration projects, because they are important SJRWMD projects needed for improving water quality. Project credits are later added back by an individual jurisdiction to track the implementation of loading reductions for that jurisdiction. **Chapter 3** describes this process in more detail, and **Chapter 4** presents the results.

Table 4. Categories of land use aggregated for nutrient sources

Land Use Category	Activity
Agriculture	Pasture Cropland Tree Crops Feeding Operations Other Agriculture
Stormwater Natural Areas	Water Wetlands Forest and Rangeland
Stormwater Developed Uses	Low-Density Residential Medium-Density Residential High-Density Residential Low-Density Commercial High-Density Commercial Industrial Mining Open Land Recreational Sprayfields

Table 5. Revised TP source loading (lbs-TP/yr) summary for Lake Apopka, Lake Beauclair, Lake Dora, Lake Eustis, and Lake Griffin

Note: Agricultural BMP and stormwater project credits through December 2017 are applied. Loads and net changes are reported in lbs-TP/yr. Summary of source information is calculated only for watershed loads and does not include in-lake loading.

Sources of TP	Lake Apopka Net Estimated Load	Net Change in Lake Apopka Sources	Lake Beauclair Net Estimated Load	Net Change in Lake Beauclair Sources	Lake Dora Net Estimated Load	Net Changes in Lake Dora Sources	Lake Eustis Net Estimated Load	Net Changes in Lake Eustis Sources	Lake Griffin Net Estimated Load	Net Changes in Lake Griffin Sources
Spring Discharge	2,208									
Muck Farm Discharge		-115,686	1,702				175	-1,020		-22,704
Restoration Area Discharges										
Apopka Restoration Area	11,895	-27,263								
Pine Meadows Restoration Area							475	-580		
Harris Bayou									423	423
Emeralda Marsh Restoration Area									4,653	-19,246
Atmospheric Deposition	13,645		311		1,267		2,251		3,816	
Tributary Inflows										
Lake Apopka Discharge			2,774	-40,752						
Lake Beauclair Discharge					4,428	-31,587				
Lake Dora Discharge			6	-9			3,074	-16,019		
Lake Eustis Discharge					13	-1			7,884	-14,448
Lake Harris Discharge							4,023	-2,264		
Lake Yale Discharge									2	
Point Sources	2,671				1		15	15		
Stormwater Runoff	-1,348*									

Sources of TP	Lake Apopka Net Estimated Load	Net Change in Lake Apopka Sources	Lake Beauclair Net Estimated Load	Net Change in Lake Beauclair Sources	Lake Dora Net Estimated Load	Net Changes in Lake Dora Sources	Lake Eustis Net Estimated Load	Net Changes in Lake Eustis Sources	Lake Griffin Net Estimated Load	Net Changes in Lake Griffin Sources
Natural Areas Runoff			324	-37	245	-81	992	41	1,688	585
Agricultural Runoff			346	33	38	18	166	34	332	-6
Agricultural BMPs				-42		-3		-5		-12
Golf Course Stormwater Runoff			10		4		7		7	
Stormwater Runoff Developed			7	-243	-31	-1,802	-1,062	-3,740	1,823	-540
Stormwater BMPs		-5,204		-228		-1,514		-4,097		-701
Septic Systems			178	49	445	33	1,391	955	1,006	320
Package WWTPs			83	19			910	-179	1,644	439
Margin of Safety	1,168									
Loading Information										
Baseline TP Loading	**138,497**		**46,681**		**39,829**		**35,174**		**78,474**	
Expected Reduction in TP loading	**108,258**		**40,940**		**33,419**		**22,757**		**55,196**	
Net Expected TP Loading	**30,239**		**5,741**		**6,410**		**12,417**		**23,278**	
TMDLs	**35,052**		**7,056**		**13,230**		**20,286**		**26,901**	

Table 6. Revised TP source loading (lbs-TP/yr) summary for priority waterbodies

Note: Stormwater project credits are not included, but agriculture BMP credits are included. Summary of source information is calculated only for watershed loads and does not include in-lake loading.

Sources of TP	Lake Harris Net Estimated Load	Palatlakaha River Net Estimated Load	Lake Carlton Net Estimated Load	Trout Lake Net Estimated Load	Lake Yale Net Estimated Load
Spring Discharge	2,047				
Muck Farm Discharges	1,827			455	
Restoration Area Discharges	-1			540	
Atmospheric Deposition	5,422		118	30	1,443
Lake Eustis Discharge	84				
Palatlakaha River Discharge	4,586				
Point Source	1				
Natural Area Stormwater Runoff	2,253	1,049	69	382	610
Agricultural Stormwater Runoff	463	397	91	68	351
Golf Courses Stormwater Runoff	13				
Developed Uses Stormwater Runoff	3,295	1,306	121	514	693
Seepage/Groundwater		27			
Septic Systems Total	2,190		70	7	586
Septic Systems	1,515		54	7	191
Package Plants	675		16		394
Loading Information					
Net TP Loading	**22,180**	**2,779**	**469**	**1,996**	**3,682**
TMDL	**18,302**	**2,207**	**195**	**521**	**2,844**
Required TP Loading Reduction to Meet TMDL	**3,878**	**572**	**274**	**1,475**	**838**

2.4 Loadings for 2017 Adopted TMDLs

TMDLs for Lake Roberts, Marshall Lake, and Lake Denham were adopted into rule in 2017 for TN and TP, and in addition to the Amendment are included in the Upper Ocklawaha BMAP. This document describes the loading reductions and projects that will meet those requirements.

2.4.1 Loading Source Data Used

Models for these lakes estimated loading from 2000 to 2012 (defined as the baseline period for the lakes), and incorporated land use data from both 2004 and 2009. Land use data for 2009 only were used to define spatial patterns of land use distribution and to assign loadings to individual jurisdictions.

The methods used to estimate watershed loading are similar to the techniques employed in the development of PLRGs and subsequent TMDLs for the Harris Chain of Lakes. These TMDLs are comparable to previously adopted TMDLs.

2.4.2 Nutrient Budgets for 2017 Adopted TMDLs

Table 7 summarizes the sources of nutrient loading for Lake Roberts, Lake Denham, and Marshall Lake. The TMDLs for these lakes estimated loadings in kilograms instead of pounds per year. This document follows that convention for consistency with the adopted TMDLs. **Appendix B** contains detailed nutrient budgets. Discharges from an historical muck farm area and internal recycling are substantial sources of TP loading for Lake Denham. Lake Roberts and Marshall Lake receive large contributions of loading from stormwater, groundwater seepage, and septic systems.

Table 7. TP source loading (kg-TP/yr) summary for 2017 adopted TMDLs

NA = Not applicable
[1] Nitrogen loads from septic systems were estimated using the ArcNLET modeling utility.
* Nutrient recycling from benthic sediments was not included in the TMDL.

Sources of TP	Lake Roberts TMDL Baseline Loading (2000–12)	Lake Denham TMDL Baseline Loading (2000–12)	Marshall Lake TMDL Baseline Loading (2000–12)
Atmospheric Deposition (Wet/Dry)	17	35	18
Stormwater Runoff	66	1,136	224
Natural Area Runoff	30	380	9
Agricultural Runoff	3	106	44
Developed Uses Runoff	33	149	171
Muck Farm	NA	500	NA
Seepage/Groundwater/Septic Systems	56[1]	7	68[1]
Internal Load	*	326	*
Baseline and Net TP Loading	**139**	**1,504**	**310**
TMDL	**100**	**593**	**97**
Required TP Loading Reduction to Meet TMDL	**39**	**911**	**213**

Chapter 3: Calculating and Apportioning Loading Reductions

The TMDLs were developed based on hydrology—i.e., how water flows and moves loading in the system. The apportionment or allocation of loading reductions requires imposing jurisdictional boundaries on a hydrologic framework. This chapter describes the process used to assign estimated loading reductions to each local jurisdiction, Florida Turnpike Enterprise, Central Florida Expressway Authority, and FDOT. The same process was used for the priority waterbodies and the new TMDLs.

The apportionment of loading reductions follows these principles:

- It is an equitable approach that achieves the following:
    - Does not favor or burden any one stakeholder over another.
    - Provides credit for previous stormwater projects or efforts as part of the total credits that a jurisdiction has accumulated.
- Local governments are not responsible for loadings derived from agricultural activities or historical agricultural areas undergoing restoration by public agencies.
- The loading reduction is proportional to the amount of loading generated in a jurisdiction.

3.1 Nutrient Budget Adjustments

Tables 5 and **6** list the nutrient source loading budgets for each watershed. Before loading reductions can be allocated to jurisdictions, additional adjustments to the nutrient budgets must be made. Loadings from atmospheric deposition, natural areas, and groundwater are included as part of each TMDL but are considered uncontrollable or background sources. Therefore, load reductions are not required for those sources.

TMDL implementation focuses on reducing loadings from anthropogenic sources described as controllable loadings, which consist of stormwater runoff from agricultural land and developed lands and septic systems within 200 meters of the waterbody. The reductions that would be assigned to atmospheric deposition, natural areas, and/or groundwater sources are apportioned to the controllable sources. A percent contribution is calculated for each controllable source as a portion of the baseline loading without the loading from atmospheric deposition, natural areas, and/or groundwater. Each source's percent contribution to loading is used to calculate a proportional reduction to meet the TMDL for that source out of the entire TMDL loading reduction. **Appendix B** contains the detailed nutrient budgets showing the adjustments made for 2009 land use and the apportionment of percent reductions among sources.

3.2 Calculating Loading Reductions

Figure 2 outlines the process used to calculate and apportion loading reductions to local jurisdictions.

3.2.1 Interpreting Land Use Data for Loading Reductions

Along with 2009 land use data, city jurisdictional boundaries, waterbody drainage basin boundaries, wastewater sprayfield delineated areas, and restoration area delineations were composited into a geographic information system (GIS) database to assist in the interpretation and assignment of loading information to jurisdictions. **Appendix A** provides complete details about the database.

Lake County's city jurisdictional boundaries (dated December 2015 and prepared by the Lake County Planning Department) and Orange County's city jurisdictional boundaries (dated March 1, 2017, and prepared by Orange County GIS) were used to define the area of each watershed in each jurisdiction. Unincorporated areas (outside a jurisdiction) were assigned to the county where they were located. Jurisdictional boundaries for cities outside Lake County and Orange County (Wildwood) were obtained from U.S. Census Bureau Topologically Integrated Geographic Encoding and Referencing (TIGER) 2010 Places data. FDOT District 5 provided the delineation of the state roadways that it maintains, as well as stormwater management areas.

SJRWMD provided land use information describing the extent of wastewater disposal sprayfields, restoration areas, and drainage basin boundaries for Lake Apopka and the Harris Chain of Lakes. The delineation of restoration areas prevented the assignment of those tracts of land to local governments.

DEP delineated the drainage boundary for the Palatlakaha River as the boundary for the impaired segment of the river contained in WBID 2839, and created the Marshall Lake, Lake Denham, and Roberts Lake Watershed delineations for TMDL development.

The aggregated land use categories listed in **Table 4** were further aggregated into three categories of developed land uses that were used to apportion reductions between different jurisdictions (**Table 8**). The land uses aggregated together have similar event mean concentrations (EMCs) and percent imperviousness, suggesting they would generate comparable loadings. Land use codes were aggregated to simplify the calculation and apportionment of loading reductions between jurisdictions, while maintaining the distribution of sources with higher versus lower loadings. The aggregation scheme used for the Palatlakaha River TMDL differs from the other waterbodies (**Table 8**) because of differences in the underlying TMDL.

Table 8. Developed land use loading category aggregation

Category	Description
Developed Land Use – High	High-density residential, high-density commercial, and industrial
Developed Land Use – Medium	Medium-density residential and low-density commercial
Developed Land Use – Low	Low-density residential, mining, sprayfields, and open land recreational

Category Palatlakaha River	Description Palatlakaha River
Developed Land Use – High	High-density residential
Developed Land Use – Medium	Medium-density residential and transportation
Developed Land Use – Low	Low-density residential and urban open

3.2.2 Proportioning Developed Land Use Loading Reductions

The developed land use loading attributed to a jurisdiction is proportional to the area and type of source loadings found within that jurisdiction's boundary. The first step in developing loading reductions was to calculate the acreage of aggregated developed land use categories for each jurisdiction. Next, the percent acreage of a land use category within the jurisdiction out of its total acreage for the watershed was calculated for each jurisdiction (**Table 9**). The assumption is that only the total acreage of a specific source differs from the calculations that were made to estimate loadings by hydrologic basin. The percent area is an appropriate surrogate for the direct modeling of land use loading by jurisdiction. A jurisdiction's percent contribution of the area of a land use loading category was multiplied by the overall proportional reduction for that land use category. The product of that calculation is the portion of the overall proportional reduction assigned to that jurisdiction for that land use category.

Table 9. Percent developed land use by watershed and jurisdiction

NA = Not applicable.
*The Marshall Lake TMDL separated loading from roadways from other urban uses. All roadway loading was assigned to FDOT and Central Florida Expressway Authority.

Watershed	Jurisdiction	Developed – High (%)	Developed – Medium (%)	Developed – Low (%)
Lake Harris	Astatula	2.2	9.1	1.6
Lake Harris	FDOT	6.4	0.9	0.1
Lake Harris	Howey-in-the-Hills	0.1	7.6	1.7
Lake Harris	Lake County	33.7	40.2	57.6
Lake Harris	Leesburg	40.1	32.0	35.7
Lake Harris	Tavares	17.4	9.7	3.2
Lake Harris	Wildwood	0.0	0.6	0.0
Palatlakaha River	Clermont	2.3	5.1	3.0
Palatlakaha River	Groveland	34.3	19.6	11.5
Palatlakaha River	Lake County	52.4	52.1	75.6
Palatlakaha River	Leesburg	10.3	1.7	6.3
Palatlakaha River	Mascotte	0.0	0.3	1.0
Palatlakaha River	Minneola	0.5	13.6	1.9
Palatlakaha River	Florida Turnpike Enterprise	0.0	2.6	NA
Palatlakaha River	FDOT	0.1	5.1	0.6
Lake Carlton	FDOT	98.1	0.2	0.0
Lake Carlton	Lake County	0.0	2.0	23.4
Lake Carlton	Orange County	1.9	97.8	76.6
Trout Lake	Eustis	50.1	38.7	19.1
Trout Lake	FDOT	10.8	0.4	0.1
Trout Lake	Lake County	3.1	26.7	64.6
Trout Lake	Umatilla	36.0	34.2	16.3
Lake Yale	Eustis	43.0	17.2	1.6
Lake Yale	FDOT	9.8	0.3	0.1
Lake Yale	Lake County	40.6	75.5	61.5
Lake Yale	Marion County	0.0	0.0	30.9
Lake Yale	Umatilla	6.6	7.0	6.0
Lake Denham	FDOT	6.0	0.0	0.0
Lake Denham	Lake County	24.1	4.4	17.0
Lake Denham	Leesburg	69.9	82.6	83.0
Lake Denham	Wildwood	0.0	12.9	0.0
Marshall Lake	Apopka	90.9	63.2	95.8
Marshall Lake	Orange County	9.1	36.8	4.2
Marshall Lake	FDOT*	NA	NA	NA
Marshall Lake	Central Florida Expressway Authority	NA	NA	NA
Roberts Lake	Orange County	22.5	48.4	95.0
Roberts Lake	Winter Garden	77.5	51.6	5.0

3.2.3 Septic System Loading

Loadings from septic systems were calculated for all priority waterbodies and 2017 adopted TMDLs except the Palatlakaha River and Lake Denham. Septic systems located within 200 meters of the waterbody shoreline and the shoreline of a tributary were included in the calculation of loading from this source. Based on a literature review, 200 meters was considered a reasonable distance to capture any migration of phosphorus from septic system effluent discharge to surface water (Fulton 1995; Fulton et al. 2004).

For Lake Harris, Lake Carlton, and Lake Yale, both package plants (permitted as groundwater discharges) and septic systems were included in loading estimates, but a proportional reduction was only calculated for the loading from septic systems. Package plants are permitted separately by DEP as wastewater discharges and are not assigned to local jurisdictions.

For Lake Harris, Lake Carlton, Trout Lake, and Lake Yale, the portion of loading reduction assigned to a jurisdiction corresponded to the number of septic systems located within that jurisdiction expressed as a percent of the total number. For example, 3.9 % of the septic systems surrounding Lake Yale are in the City of Eustis, and thus Eustis is assigned 3.9 % of the proportional loading reduction for septic systems.

The TMDLs for Marshall Lake and Lake Roberts include combined septic system loading and groundwater seepage loading. The combined loading was proportioned by the percent area of the basin occupied by each jurisdiction and was not adjusted for the specific locations of septic systems.

3.2.4 Total Reductions

The total loading reduction assigned to each jurisdiction is the sum of reductions for developed land uses and septic systems/groundwater seepage. **Table 10** summarizes the allocated total reductions assigned to each jurisdiction for priority waterbodies. **Table 11** summarizes the allocated total reductions assigned to local jurisdictions for Lake Denham, Marshall Lake, and Lake Roberts.

3.3 Low-Priority Ranking Determination

In some basins, individual jurisdictions contribute less than 1 % of the total developed loading attributed to land use. The contribution to overall nutrient loading is low enough that reductions from these areas would have a limited impact on the required reductions for this phase of the BMAP; thus, these entities are considered a low priority for implementing reductions.

The total developed land loading was calculated for each jurisdiction using the same proportioning technique as for the calculation of reductions. The percent area of each developed land use category within a jurisdiction was multiplied by the total developed land use loadings for that category to calculate the proportion of loading assigned to that jurisdiction.

Tables 12 and **13** summarize the priority ranking calculations by basin. Jurisdictions meeting the classification requirements for low priority are highlighted in green. Local governments that met the low-priority classification include Wildwood in the Lake Harris Watershed and Mascotte and the Florida Turnpike Enterprise in the Palatlakaha Watershed. These entities have controls in place to manage nutrients, either through a municipal separate storm sewer system (MS4) permit for stormwater or, in the case of Wildwood, a consumptive use permit from the Southwest Florida Water Management District (SWFWMD). These entities will not be required to meet the first five-year reduction target for TP.

This low-priority status will be reviewed in future phases of the BMAP. TP reductions may be needed from the low-priority entities at that time. Therefore, although they do not currently have a reduction responsibility, these entities are not exempted from such requirements in future BMAPs. Any actions taken by the entities that result in TP reductions will be documented for credit against any reduction requirements allocated in subsequent BMAP iterations.

Table 10. Summary of TP loading (lbs-TP/yr) reductions for developed land use and septic system/groundwater seepage

Jurisdiction	Palatlakaha Developed Land Use Reduction	Lake Harris Developed Land Use Reduction	Lake Harris Septic System Reduction	Lake Carlton Developed Land Use Reduction	Lake Carlton Septic System Reduction	Lake Yale Developed Land Use Reduction	Lake Yale Septic System Reduction	Trout Lake Developed Land Use Reduction	Trout Lake Septic System Reduction	Total TP Reduction Assigned to Jurisdiction
Astatula		40.1	25.2							**65.3**
Clermont	15.1									**15.1**
Eustis						119.2	3.8	211.9	1.3	**336.2**
FDOT	8.6	46.9		15.6		23.5		29.0		**123.7**
Groveland	118.9									**118.9**
Howey-in-the-Hills		21.6	41.8							**63.4**
Lake County	244.9	386.4	402.3	11.9	24.9	184.3	95.0	72.3	5.6	**1,422.1**
Leesburg	30.5	390.1	1.0							**421.6**
Marion County						7.7				**7.7**
Mascotte	0.9									**0.9**
Minneola	24.0									**24.0**
Orange County				90.2	27.6					**117.8**
Tavares		147.9	5.4							**153.3**
Umatilla		-				23.9		165.5		**189.4**
Wildwood		1.5								**1.5**
Turnpike Enterprise Authority	4.2									**4.2**
Total Reduction Developed Land Use and Septic Systems	**447.1**	**1,034.6**	**475.8**	**117.7**	**52.5**	**358.5**	**98.8**	**478.7**	**6.9**	**3,065.1**

Table 11. Summary of TP loading (kg-TP/yr) reductions for developed land use and septic system/groundwater seepage for Lake Denham, Marshall Lake, and Lake Roberts

NA = Not applicable

Jurisdiction	Lake Denham Developed Land Use Reduction	Lake Denham Total Reduction	Lake Roberts Developed Land Use Reduction	Lake Roberts Groundwater TP Reduction	Lake Roberts Total Reduction	Marshall Lake Developed Land Use Reduction	Marshall Lake Groundwater TP Reduction	Marshall Lake Total Reduction
FDOT	6.0	6.0				7.2	NA	7.2
Central Florida Expressway Authority						15.0	NA	15.0
Lake County	26.0	26.0						
Leesburg	91.1	91.1						
Wildwood	2.7	2.7						
Orange County			10.4	13.1	23.5	17.2	5.5	22.7
Muck Farm	420.8	420.8						
Winter Garden			9.0	4.9	13.9			
Apopka						90.4	44.5	134.9

Table 12. Summary of low-priority ranking calculations for priority waterbodies

Note: Green highlighting and boldface type indicate jurisdictions meeting the classification requirements for low priority.

Lake Basin	2009 Developed Land Loading by Jurisdiction	Total Loading Developed – High (lbs-TP/yr)	Total Loading Developed – Medium (lbs-TP/yr)	Total Loading Developed – Low (lbs-TP/yr)	Developed Land Total Loading (lbs-TP/yr)	% of Developed Land Total Loading
Carlton	Lake County	0.0	1.1	11.1	12.3	10.1
Carlton	FDOT	15.9	0.1	0.0	16.0	13.3
Carlton	Orange County	0.3	55.9	36.5	92.7	76.6
Harris	Wildwood	0.0	4.8	0.0	4.8	**0.1**
Harris	Howey-in-the-Hills	3.1	61.0	4.8	68.9	2.1
Harris	Astatula	49.6	73.3	4.6	127.5	3.9
Harris	FDOT	142.1	7.0	0.4	149.5	4.5
Harris	Tavares	383.8	78.0	9.1	470.9	14.3
Harris	Lake County	743.4	323.2	163.9	1,230.5	37.4
Harris	Leesburg	883.5	257.2	101.6	1,242.3	37.7
Palatlakaha	Mascotte	0.1	1.2	1.4	2.7	**0.2**
Palatlakaha	Florida Turnpike Enterprise	0.0	12.3	0.0	12.3	**0.9**
Palatlakaha	FDOT	0.6	23.7	0.0	24.4	1.9
Palatlakaha	Clermont	16.1	23.9	4.2	44.2	3.4
Palatlakaha	Minneola	3.7	63.7	2.7	70.0	5.4
Palatlakaha	Leesburg	72.0	8.2	8.8	89.0	6.8
Palatlakaha	Groveland	239.0	92.0	16.0	347.1	26.6
Palatlakaha	Lake County	365.1	244.7	105.4	715.2	54.8
Trout	FDOT	30.2	0.9	0.0	31.1	6.1
Trout	Lake County	8.7	57.9	11.1	77.7	15.1
Trout	Umatilla	101.1	73.9	2.8	177.8	34.6
Trout	Eustis	140.6	83.8	3.3	227.6	44.3
Yale	Marion County	0.0	0.0	14.8	14.8	2.1
Yale	FDOT	44.8	0.6	0.0	45.5	6.6
Yale	Umatilla	30.4	13.0	2.9	46.2	6.7
Yale	Eustis	197.7	31.9	0.8	230.3	33.2
Yale	Lake County	186.9	139.8	29.5	356.2	51.4

Table 13. Summary of low-priority ranking calculations for Lake Denham, Marshall Lake, and Lake Roberts

Note: Only loading from roadways in the Lake Marshall Watershed is assigned to FDOT and the Central Florida Expressway Authority.
NA = Not applicable.

Lake Basin	2009 Developed Land Loading by Jurisdiction	Total Loading Developed – High (kg-TP/yr)	Total Loading Developed – Medium (kg-TP/yr)	Total Loading Developed – Low (kg-TP/yr)	Developed Land Total Loading (kg-TP/yr)	% of Developed Land Total Loading
Denham	FDOT	7.2	0	0	7.2	4.8
Denham	Lake County	28.9	1.1	0.9	30.9	20.7
Denham	Leesburg	84.0	20.0	4.2	108.2	72.4
Denham	Wildwood	0	3.1	0	3.2	2.1
Roberts	Orange County	0.1	14	3.8	17.8	53.8
Roberts	Winter Garden	0.2	14.9	0.2	15.3	46.2
Marshall	Apopka	95.7	22.4	1.0	119.1	69.4
Marshall	Orange County	9.5	13.1	0.0	22.6	13.2
Marshall	FDOT	NA	NA	NA	9.5	5.6
Marshall	Central Florida Expressway Authority	NA	NA	NA	19.8	11.6

Chapter 4: Reductions and Management Strategies by Watershed

Once loading reductions are calculated for jurisdictions, progress toward achieving the TMDLs is determined. This chapter describes how project credits are calculated and assigned to individual jurisdictions and how progress toward meeting TMDL targets is tracked. A summary table of credits achieved by each jurisdiction is provided for each TMDL. Recommendations for potential management activities are given where total credits are insufficient to achieve the TMDLs.

4.1 Determining Education Credits

Local jurisdictions receive credit for the education activities outlined in **Table 14** as a percent reduction based on their developed land stormwater loading. Education programs are an important component of restoration programs and a cost-effective way of addressing nutrient loading. The maximum credit that a jurisdiction can receive is 6 % of its developed land stormwater loading if it has all the required education components.

Education activities are treated as watershed-specific projects, and credits are calculated for each TMDL. An individual jurisdiction may participate in more than one TMDL. Education projects are not typically confined to a specific watershed, but rather are distributed across the jurisdiction's area. Education projects were created for each combination of TMDL and jurisdiction and are listed in **Appendix C.** Projects listed in the appendix are organized alphabetically by jurisdiction.

Table 14. Education credit components

Activity	Credit (%)	Activity Details
Florida Friendly Landscaping (FFL) Program	3	Support University of Florida Institute of Food and Agricultural Sciences (UF–IFAS) Program or alternative to FFL Program
Landscaping Local Code/Ordinance	0.50	
Irrigation Local Code/Ordinance	0.50	
Fertilizer Local Code/Ordinance	0.50	Meets minimum elements of model ordinance
Pet Waste Management Local Code/Ordinance	0.50	
Public Service Announcements (PSAs)	0.25	MS4 permit element
Informational Pamphlets	0.25	MS4 permit element
Website	0.25	MS4 permit element
Inspection Program and Call-In Number for Illicit Discharges	0.25	MS4 permit element
Total Credit for Education Activities	**6.00**	

Table 15 summarizes education credits by jurisdiction and TMDL watershed for the nonpriority waterbodies. Education credits were not calculated for Lake Apopka because models used for TMDL development did not separate developed land stormwater runoff from agriculture or natural area runoff. Nutrient budgets presented in **Appendix B** for the nonpriority waterbodies include education credits as a project. Reductions from projects in one waterbody are accounted for in downstream waterbodies.

Table 16 summarizes education credits for priority waterbodies by jurisdiction, and **Table 17** summarizes education credits for the 2017 adopted TMDLs. Lake County receives additional education credit for FFL-type programs that are available to residents within the boundaries of Lake County's cities that do not independently support the FFL Program. This credit is awarded as 3 % of the developed land loadings. For Lake Harris, developed land loadings from Astatula, Howey-in-the-Hills, and Tavares are included. For the Palatlakaha River, developed land loadings from Groveland, Mascotte, Minneola, and Clermont are included. For Lake Dora, developed land loadings from Mount Dora and Tavares are included, and for Lake Eustis, developed land loadings from Tavares are included.

Jurisdictions covered by an MS4 permit typically meet the education elements identified in **Table 14** as an MS4 permit element. They receive a minimum 1 % education credit. Mascotte and Howey-in-the-Hills receive credit through this provision. Although Wildwood does not have an MS4 permit, it meets the 1 % education credit because consumptive use permits issued by SWFWMD require the city to practice water conservation and follow FFL recommendations for fertilizing and irrigating landscapes. A jurisdiction can increase its education credit by adding program elements outlined in **Table 14**.

4.2 Crediting and Prioritizing Projects

Projects for which loading reduction credits were assigned include structural BMP retrofits, street sweeping, the cessation of fertilizer use, and the cleanout of BMPs. Project credits are cumulative starting with the 2007 adopted Upper Ocklawaha BMAP. **Appendix C** lists new projects, not previously adopted.

FDOT ceased the annual maintenance application of fertilizer to medians and rights-of-way in 2006. The agency calculated that as much as 30.5 % of the applied fertilizer was washed off rights-of-way and medians, based on an evaluation of FDOT fertilization practices by Chopra et al. (2011). FDOT provided estimates of the acreage fertilized in each watershed and the reduction in TP and TN loading achieved by not applying fertilizer. A separate fertilizer cessation project is listed for each TMDL watershed.

Estimates of TP and TN reduction by street sweeping and BMP cleanout were made using a tool developed by the Florida Stormwater Association in 2012, based on data collected by Sansalone et al. (2011) that uses the volume or mass of material removed to estimate the pounds of TP and TN removed. Streets in many of the jurisdictions in the Upper Ocklawaha Basin are in more than one lake watershed, but sweepings are typically not collected by individual TMDL watershed.

Loading reductions for street sweeping are apportioned as a percent of the total reduction to each TMDL watershed, based on the number of miles swept in that watershed out of the total miles swept throughout the jurisdiction. If the total mileage was not known, the percent of the jurisdiction within each TMDL watershed was used to apportion street sweeping credits. Cleanout credits are assigned based on the TMDL watershed where the structure is located. If the volumes or weights of cleanout material cannot be separated by watershed, then the credits are partitioned between watersheds based on the percent area of each within a jurisdiction.

In 2016, the Florida Legislature amended the Florida Watershed Restoration Act (FWRA) (Section 403.067, F.S.), creating additional requirements for all new or revised BMAPs to include planning-level details for each listed project, along with their proposed priority ranking for implementation and funding needs. Project status was selected as the most appropriate indicator of a project's priority ranking based primarily on need for funding. The management strategies listed in **Table C-1** in **Appendix C** are ranked as high, medium, or low priority based on project status. Projects with a "completed" status were assigned a low priority. Projects classified as "underway" were assigned a medium priority because some resources have been allocated to these projects but additional assistance may be needed for completion. High priority was assigned to projects listed as "proposed" or "conceptual." These projects typically need to be funded and implemented to achieve substantial reductions, or studies need to be completed to appropriately plan for additional load reductions.

There are exceptions to the assignment of priority based on project status. For example, pollution prevention projects such as street sweeping and good housekeeping measures are assigned a high priority, regardless of their status, because they are cost-effective and require continuing effort. Public outreach projects have a high priority because they are an integral component of BMAPs and are focused on preventing nutrient pollution, which is much more economical than deploying treatment efforts.

Table 15. Education credits by jurisdiction for the nonpriority waterbodies (lbs-TP/yr)

SW = Stormwater

Jurisdiction	Credit for Educational Activities (%)	Lake Griffin SW Loading	Lake Griffin Reductions	Lake Eustis SW Loading	Lake Eustis Reductions	Lake Dora SW Loading	Lake Dora Reductions	Lake Beauclair SW Loading	Lake Beauclair Reductions
Eustis	**6.00**			700.5	42.0	58.5	3.5		
FDOT	**0.500**	33.6	0.2	78.8	0.4	17.5	0.1		
Groveland	**2.25**								
Howey-in-the-Hills	**1.00**								
Lake County	**5.50**	1,125.4	61.9	1,689.6	92.9	741.3	40.8	187.9	10.3
Leesburg	**6.00**	511.1	30.7	75.6	4.5				
Marion County	**5.50**	717.6	39.5						
Orange County	**6.00**					15.7	0.9	46.8	2.8
Tavares	**1.75**			491.5	8.6	367.2	6.4	0.1	0.0
Umatilla	**5.50**								
Wildwood	**1.00**								
Florida Turnpike Enterprise	**0.00**								
Fruitland Park	**5.50**	136.4	7.5						
Mount Dora	**1.50**					282.7	4.2	0.1	0.0
Apopka	**5.50**								
Winter Garden	**6.00**								
Central Florida Expressway Authority	**0.00**								
Lake County City Jurisdiction	**3.00**			491.5	14.7	649.9	19.5		
Total SW Loading		**2,524.0**	**139.7**	**3,036.0**	**148.5**	**1,483.0**	**55.9**	**235.0**	**13.1**

Table 16. Education credits by jurisdiction for the priority waterbodies (lbs-TP/yr)

SW = Stormwater

Jurisdiction	Credit for Educational Activities (%)	Palatlakaha SW Loading	Palatlakaha Reductions	Lake Harris SW Loading	Lake Harris Reductions	Lake Carlton SW Loading	Lake Carlton Reductions	Lake Yale SW Loading	Lake Yale Reductions	Trout Lake SW Loading	Trout Lake Reductions
Astatula	**0.00**			127.5	0.0						
Clermont	**2.25**	44.2	1.0								
Eustis	**6.00**							230.3	13.8	227.6	13.7
FDOT	**0.500**	24.4	0.1	149.5	0.7	16.0	0.1	45.5	0.2	31.1	0.2
Groveland	**2.25**	347.1	7.8								
Howey-in-the-Hills	**1.00**			68.9	0.7						
Lake County	**5.50**	715.2	39.3	1,230.5	67.7	12.3	0.7	356.2	19.6	77.7	4.3
Leesburg	**6.00**	89.0	5.3	1,242.3	74.5						
Marion County	**5.50**							14.8	0.8		
Mascotte	**1.00**	2.7	0.0								
Minneola	**1.00**	70.0	0.7								
Orange County	**6.00**					92.7	5.6				
Tavares	**1.75**			470.9	8.2						
Umatilla	**5.50**							46.2	2.5	177.8	9.8
Wildwood	**1.00**		0	26.8	0.3						
Florida Turnpike Enterprise	**1.00**	12.3	0.0								
Lake County City Jurisdiction	**3.00**	464.0	13.9	667.4	20.0						
Total SW Loading		**1,304.9**	**54.3**	**3,316.6**	**152.2**	**121.1**	**6.4**	**693.0**	**37.0**	**514.3**	**27.9**

Table 17. Education credits by jurisdiction for the 2017 adopted TMDL waterbodies (kg-TP/yr)

SW = Stormwater

Jurisdiction	Credit for Educational Activities (%)	Lake Roberts SW Loading	Lake Roberts Reductions	Marshall Lake SW Loading	Marshall Lake Reductions	Lake Denham SW Loading	Lake Denham Reductions
FDOT	**0.50**			9.5	0.05	7.2	0.0
Lake County	**5.50**					30.9	1.7
Leesburg	**6.00**					108.2	6.5
Orange County	**6.00**	17.8	1.1	22.7	1.4		
Wildwood	**1.00**					3.2	0.0
Apopka	**5.50**			119.1	6.5		
Winter Garden	**6.00**	15.3	0.9				
Central Florida Expressway Authority	**0.00**			19.8	0.0		
Total SW Loading		**33.2**	**2.0**	**171.1**	**8.0**	**149.4**	**8.2**

4.3 Managing TP Loadings

This section contains a table for each priority waterbody and 2017 adopted TMDL that summarizes each jurisdiction's assigned loading reduction and education and project credits. In cases where local jurisdictions have met their allotted reductions, the value in the column "Final Reduction Needed" is 0.

For all waterbodies a period of 10 years, until 2027, was assigned to implement activities to reduce TP loading and meet the TMDLs. Overall loading reductions assigned to a jurisdiction are the sum of reductions for developed land and, where present, septic systems within 200 meters of a waterbody shoreline or tributary shoreline. The loading reduction is expected to occur throughout the 10-year period, with specific targets for developed land uses for each 5-year period. The loading reduction assigned to septic systems must be achieved by 2027, though that reduction does not have to be specifically targeted towards septic systems.

Education credits are assigned to the first 5-year period, and only if additional educational activities are undertaken will additional credits be awarded for the second 5-year period. Education credits calculated as less than 0.5 kg-TP/yr or lbs-TP/yr are represented in TMDL summary tables as 0. Education credits calculated between 0.5 and 1.0 kg-TP/yr or lbs-TP/yr are represented in TMDL summary tables as 1.

Appendix C lists new projects not previously adopted. For waterbodies without adequate project credits to meet required reductions, management strategies are suggested that could be considered for project development. New projects may be added during each annual reporting period.

4.3.1 Palatlakaha River

The Palatlakaha River originates in the Green Swamp. The impaired segment, WBID 2839, originates from Lake Minnehaha and discharges to Lake Harris. The river system is a mix of stretches of wetlands and large lakes connected by stream channels or canals. Several water control structures regulate flow along this section of the river.

After adjusting for 2009 land use changes, 589 lbs-TP/yr (**Table B-10** in **Appendix B**) will need to be removed to meet the TMDL of 2,207 lbs-TP/yr. Of the 589 lbs-TP/yr, 447 lbs-TP/yr is the reduction assigned to developed land uses, and 142 lbs-TP/yr is attributed to agriculture. **Table 18** identifies the jurisdictions assigned a loading reduction for this waterbody. Combined credits for projects and education activities will reduce allocated TP loadings by 1,875 lbs/yr.

Through December 2017, 1,038 acres of agricultural land were under an NOI, and of that acreage 826 acres (13.7 % of total modeled acres) were included in modeled loading estimates. A large part of the acreage is attributed to plant nurseries. Loading reductions for agricultural BMPs are 17 lbs-TP/yr.

Mascotte and the Florida Turnpike Enterprise each contribute less than 1 % of the developed land stormwater total loading and are ranked as low priority. For the first 5-year period they are

not required to achieve allocated reductions. Supporting that decision is the fact that both entities are MS4 permit holders. The Florida Turnpike Enterprise sweeps the highway, cleans drainage structures, and inspects major outfalls and stormwater ponds at least once per year. Maintenance fertilizing is not done on the Turnpike's grass medians or rights-of-way. Mascotte maintains stormwater ponds and installed an infiltration box at Sunset Lake with grant funding from Lake County Water Authority (LCWA). Most of the developed area of Mascotte drains to the west, away from the Palatlakaha Basin.

Clermont and FDOT meet all their loading reduction targets. FDOT uses street sweeping and the cessation of fertilizer use to meet loading reductions. Clermont has reduced loading through street sweeping and stormwater retrofits.

Suggested management strategies that may result in projects with loading reductions include regional stormwater treatment, improved residential fertilizer management, and the implementation of DEP's golf course BMP manual.

Table 18. Palatlakaha River required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reductions to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Developed Land Use Reductions to Be Achieved by 2027
Clermont	15	8	1	359	**0**	7	**0**
Groveland	119	60	8	15	**37**	59	**96**
Lake County	245	123	53	12	**57**	122	**180**
Leesburg	30	15	5	0	**10**	15	**25**
Mascotte	1	1	0	0	**1**	0	**1**
Minneola	24	12	1	2	**9**	12	**21**
Florida Turnpike Enterprise	4	2	0	0	**2**	2	**4**
FDOT	9	4	0	1,487	**0**	5	**0**
Total	**447**	**225**	**68**	**1,875**	**116**	**222**	**327**

4.3.2 Lake Harris

Lake Harris receives water from the Palatlakaha River, Lake Denham, several springs, and occasionally a small discharge from Lake Eustis through Dead River. Little Lake Harris is included in the Lake Harris Basin because TMDL modeling could not separate the two lakes. Historically, large farms (muck farms) were located on the north side of the lake, but that land is now restored and managed as the Harris Bayou (Harris Conservation Area). The Harris Bayou is used to convey water from Lake Harris to Lake Griffin as part of the management of lake levels

and flood control in the Upper Ocklawaha Basin. TP in the amount of 423 lbs/yr is transferred to Lake Griffin through the Harris Bayou.

After adjusting for 2009 land use changes, 3,890 lbs-TP/yr (**Table B-8** in **Appendix B**) will need to be removed to meet the TMDL of 18,302 lbs-TP/yr. Of the total 3,890 lbs-TP/yr reduction, 1,510 lbs-TP/yr are assigned to developed land uses and septic systems within the lake's watershed, and 153 lbs-TP/yr are attributed to agriculture. A reduction of 2,226 lbs-TP/yr is assigned to the Lake Harris tributary watershed and could be accomplished through projects and/or education activities directed at the remediation of an active muck farm or from the Palatlakaha River Basin. **Table 19** identifies the jurisdictions assigned a loading reduction for this waterbody. Potential project credits for Lake Denham and the Palatlakaha River are not accounted for in **Table 19**.

Combined agricultural NOI enrollment for Little Lake Harris and Lake Harris is 942 acres, or 13 % of the modeled TMDL agricultural acres. BMP credit for this acreage is 9 lbs-TP/yr. Golf courses account for 194 acres and an estimated 13 lbs-TP/yr, or 25.4 % of the entire "Other Agriculture" category of loading. Land originally designated as agricultural has been converted to medium-density residential land use, removing 3 lbs-TP/yr from agricultural loading.

Wildwood contributes less than 1 % of the developed land loading of TP to Lake Harris. This amount is considered a low-priority loading to the lake. Though not an MS4 permitholder, Wildwood has a 1 % education credit because consumptive use permits issued by SWFWMD require the city to conserve water and follow FFL recommendations for fertilizing and irrigating landscapes. These provisions generate a 0.3 lbs-TP/yr credit for the city, but because this amount is less than 0.5 lbs-TP/yr, it is listed in **Table 19** as 0. Wildwood is encouraged, but not required, to make additional loading reductions before 2022.

FDOT's street sweeping and fertilizer cessation projects provide enough loading reduction to meet its entire 10-year period loading reduction. Lake County has more than 200 lbs-TP/yr credit from previous stormwater BMPs but may still need to reduce by another 496 lbs-TP/yr. Howey-in-the-Hills has enough credits from projects and education to meet the 11 lbs TP/yr reduction target for 2022 but will need to make further reductions of 52 lbs TP/yr by 2017.

Loading reductions in the Palatlakaha River and Lake Denham Basins will also decrease overall loading into Lake Harris; this could reduce the need in the second five-year period for jurisdictions to meet their full apportionment of loading reductions. Other suggested management strategies include regional stormwater treatment, improved residential fertilizer management, and the implementation of DEP's golf course BMP manual.

Table 19. Lake Harris required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reduction, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
Astatula	40	20	0	0	**20**	20	**40**	25	**65**
FDOT	47	24	1	1,207	**0**	23	**0**		**0**
Howey-in-the-Hills	22	11	1	11	**-1**	11	**10**	42	**52**
Lake County	386	193	88	205	**-99**	193	**94**	402	**496**
Leesburg	390	195	75	37	**84**	195	**279**	1	**280**
Tavares	148	74	8	10	**56**	74	**130**	5	**135**
Wildwood	2	1	0	0	**1**	1	**1**		**2**
Total	**1,035**	**517**	**172**	**1,470**	**61**	**517**	**554**	**475**	**1,030**

4.3.3 Lake Carlton

Lake Carlton is located south of Lake Beauclair and is partially connected to it, allowing an exchange of water between the two lakes. Lake Carlton is included in loading estimates for Lake Beauclair. The TMDL included Lake Ola as part of Lake Carlton's drainage basin. Lake Carlton is located in the northwest corner of Orange County, and Lake and Orange Counties share jurisdiction.

The loading reduction needed after accounting for 2009 land use changes is 283 lbs-TP/yr (**Table B-7** in **Appendix B**) to meet the TMDL of 195 lbs-TP/yr. Of the total 283 lbs-TP/yr reduction, 146 lbs-TP/yr is allotted to developed land uses and septic systems, and 97 lbs-TP/yr is attributed to agriculture. **Table 20** identifies the jurisdictions assigned a loading reduction for this waterbody.

Agricultural NOIs cover 269 acres of the modeled TMDL watershed agricultural land use and account for a 9 lbs-TP/yr reduction in loading.

LCWA and Orange County Environmental Protection Department (OCEPD) have partnered to conduct a hydrologic and nutrient source assessment on Lake Carlton through a mutual contractor. This investigation will quantify sources of nutrient pollutant loading and characterize the hydrology in the watershed. The results of that study will be used to develop a water quality improvement and management plan for the lake accessible to stakeholders and other interested parties.

OCEPD contractors are conducting two additional investigations to help characterize the transport of nutrient pollutant loads in the Upper Ocklawaha BMAP area. In addition to Lake Carlton, assessments are underway within the watersheds for Black Lake (WBID 2875A), Lake Roper (WBID 2875C), Lake Tilden (WBID 2875B), and Lake Pearl (west) (WBID 2872B). These investigations will identify the sources and sinks of nutrient pollutant loads in the respective watersheds and will produce a list of ranked BMPs that can be implemented should the required resources (e.g., availability of land for construction, stakeholder willingness, funding mechanisms, etc.) become available.

FDOT has met its 10-year reduction goal through street sweeping and cessation of fertilizer use on rights-of-way.

Table 20. Lake Carlton required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5- Year 50% Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50% Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
FDOT	16	8	0	207	**0**	8	0	0	**0**
Lake County	12	6	1	3	**2**	6	8	25	**33**
Orange County	90	45	6	0	**39**	45	84	28	**112**
Total	**118**	**59**	**7**	**210**	**41**	**59**	**92**	**53**	**145**

4.3.4 Trout Lake

Trout Lake is a small lake located close to the northeast side of Lake Eustis and is part of the Lake Eustis drainage basin. It is a small lake within a much larger watershed. A canal connects Lakes Eustis and Trout. Trout Lake receives flow from Hicks Ditch, which drains an historical agricultural area (a former muck farm operation), Pine Meadows Conservation Area, for part of the year. Hicks Ditch is a major source of TP loading into Trout Lake. The management of Pine Meadows Conservation Area has been transferred to Lake County Parks and Recreation Department in partnership with FWC and SJRWMD, and the area is being enhanced for recreational use.

The loading reduction needed after accounting for 2009 land use changes is 1,476.5 lbs-TP/yr (**Table B-6** in **Appendix B**) to meet the TMDL of 521 lbs-TP/yr. Of the total reduction, 486 lbs-TP/yr is assigned to developed land uses and septic systems, and 65 lbs-TP/yr is attributed to agriculture. The remaining reduction of 925.5 lbs-TP/yr is assigned to the Pines Meadows Conservation Area discharge to account for historical agricultural inputs. **Table 21** lists the jurisdictions assigned a loading reduction for this waterbody.

Agricultural NOIs cover 208 of the modeled agricultural acres in the TMDL watershed. The loading reduction from those BMPs is 2 lbs-TP/yr.

Discharge from the Pine Meadows Conservation Area, conveyed by Hicks Ditch, is treated with a hybrid wetland treatment system. FDACS funded the construction and will fund the operation of the Trout Lake Hybrid Wetland Treatment System over the next 5 years to treat water coming from Hicks Ditch before the ditch discharges to Trout Lake. The treatment system is located on land leased to FDACS by the City of Eustis and could potentially remove 2,214 lbs-TP/yr, but monitoring will verify the removal amount. Credits awarded to this project were split between the City of Eustis (199 lbs-TP/yr) and FDACS (2,015 lbs-TP/yr). The facility became operational in spring 2017.

A second phase of the project would allow the removal and treatment of water directly from Trout Lake and would be operational during dry weather when there is no water in Hicks Ditch. Implementing the second phase of the Hicks Ditch project is a high priority for the LCWA. This project meets the loading reductions for the City of Eustis and agricultural runoff.

LCWA contracted with Environmental Research and Design, Inc. (ERD) for a hydrologic and nutrient loading evaluation of Trout Lake that provides recommendations for additional loading reduction and restoration projects (ERD 2017). The results of that evaluation indicated that accumulated sediment on the lake bottom averaged 2.2 feet deep, with a maximum greater than 6 feet closer to the center of the lake (**Figure 3**). The mean residence time of water in the lake is 167 days.

The internal recycling of nutrients is another potential source that was not included in the TMDL. The evaluation of chlorophyll *a* data from 1993 to 2015 identified water color as an important factor limiting algal growth, rather than nutrients provided through the current rate of loading into the lake.

Other management strategies suggested by ERD (2017) to reduce TP loading into and within the lake include sediment inactivation with alum to help control nutrient inputs from groundwater seepage and the dredging of the lake bottom to remove sediments. Dredging is costly and its effectiveness diminishes over time, making it a less feasible management technique. All suggested management strategies are evaluated for cost and feasibility before they can be implemented as BMP projects.

FDOT and Lake County meet their respective overall loading reductions through stormwater retrofits, street sweeping, education outreach, and for FDOT the cessation of fertilizer application on state road medians and rights-of-way. Overall, adopted and proposed projects and education outreach (**Appendix C**) will potentially prevent 2,994 lbs-TP/yr from entering Trout Lake.

Table 21. Trout Lake required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reduction, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
Eustis	212	106	14	199	**-107**	106	-1	1	**0**
FDOT	29	15	0	531	**0**	14	0	0	**0**
Lake County	72	36	4	143	**0**	36	0	6	**0**
Umatilla	166	83	10	106	**-33**	83	50	0	**50**
FDACS				2,015					**0**
Total	**479**	**240**	**28**	**2,994**	**-140**	**239**	**49**	**7**	**50**

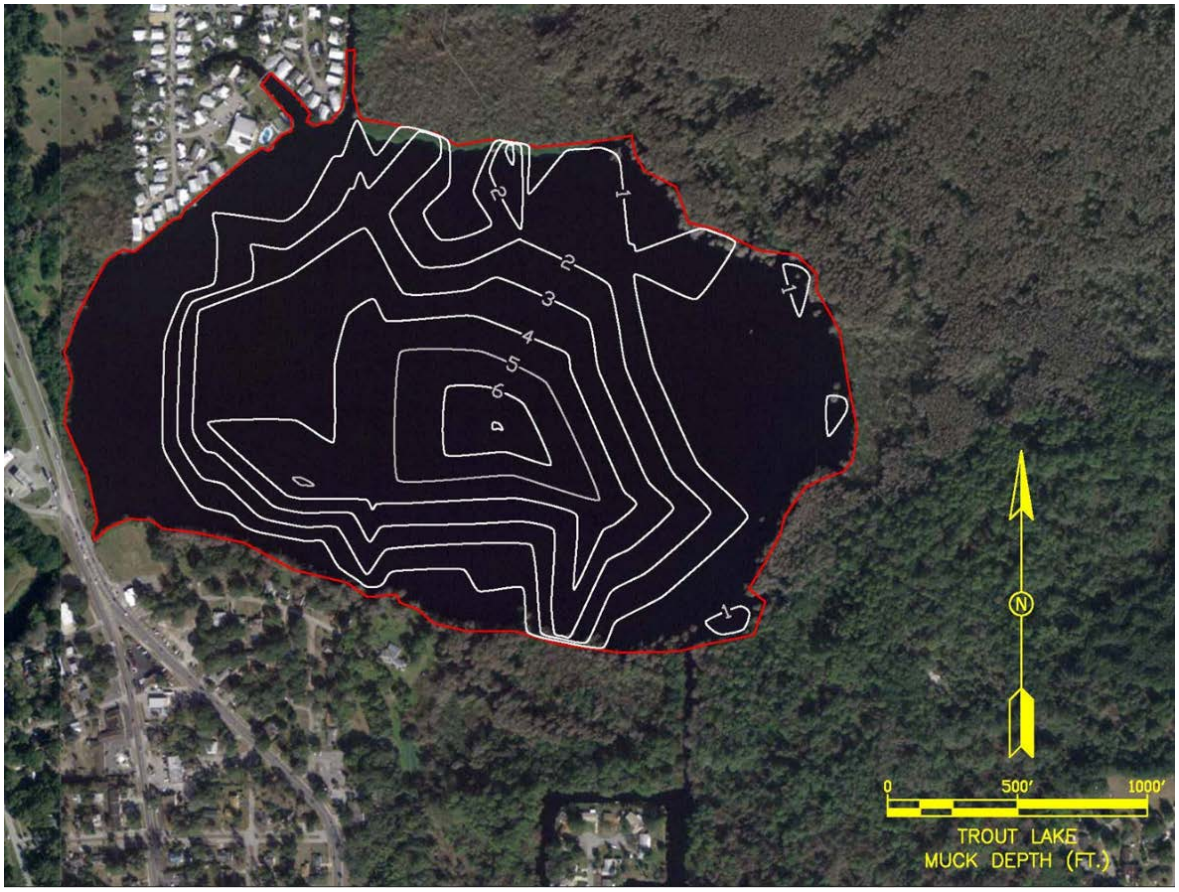

Figure 3. Depth of sediment contours for Trout Lake

4.3.5 Lake Yale

Lake Yale is located east of Lake Griffin, and the lakes are connected through the Yale-Griffin Canal. The primary sources of nutrient loading are atmospheric deposition, developed land uses, and septic systems/package plants within 200 meters of the lake. Hydrilla spread in the lake in the 1970s, and an aggressive program of chemical treatment and grass carp introduction was used in the 1980s to control the hydrilla. While the hydrilla were eliminated, so was the native vegetation (Hart 2017), and the lake shifted to an algal-dominated ecosystem.

After accounting for 2009 land use changes, the loading reduction is 848 lbs-TP/yr (**Table B-9** in **Appendix B**) to meet the TMDL of 2,844 lbs-TP/yr. Of the total loading reduction, 457 lbs-TP/yr are assigned to developed land uses and septic systems, and 187 lbs-TP/yr are attributed to agriculture. The remaining 204 lbs-TP/yr reduction are assigned to package plants. **Table 22** lists the jurisdictions assigned a loading reduction for this waterbody.

Agricultural NOIs cover 704 acres of the modeled agricultural area, primarily tree crops and pasture, within the TMDL watershed. This equates to a 10 lbs-TP/yr reduction in agricultural loadings.

FDOT meets its loading reduction through the cessation of fertilizer use and street sweeping. Other jurisdictions will need to reduce a total of 373 lbs-TP/yr.

LCWA contracted with ERD in 2015 to complete a water quality investigation of Lake Yale. The investigation surveyed and identified potential lake nutrient sources not previously evaluated and proposed remediation strategies.

Table 22. Lake Yale required reductions and credits (lbs-TP/yr) by jurisdiction

* If project credits are greater than the total required reduction, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027	Total Septic System Reduction to Be Achieved by 2027	Remaining Septic System and Developed Land Use Reductions to Be Achieved by 2027
Eustis	119	60	14	2	**44**	59	103	4	**107**
FDOT	24	12	0	475	**0**	12	0	0	**0**
Lake County	184	92	20	15	**57**	92	149	95	**244**
Marion County	8	4	1	0	**3**	4	7	0	**7**
Umatilla	24	12	3	6	**3**	12	15	0	**15**
Total	**359**	**180**	**38**	**498**	**107**	**179**	**275**	**99**	**373**

The results of the ERD evaluation (2017) indicated that sediment accumulations on the lake bottom averaged 5.2 feet in depth, with a maximum greater than 12 feet around the center of the lake (**Figure 4**). The mean residence time of water in the lake is 710 days. Internal recycling is another potential nutrient source that was not included in the TMDL. Lake water elevations since about 2000 have been lower than in previous years, even in years when annual rainfall volumes were comparable to historical records. Part of the surface watershed attributed to Lake Yale may consist of closed basins that do not contribute water to the lake. This change reduces the watershed area by half or more, resulting in a large lake surface area compared with the surface water contributing area.

Concentrations of TP in seepage samples were higher (greater than 0.12 mg/L) (**Figure 5**) in the southwest corner of the south lobe of the lake compared with the rest of the lake (largely less than 0.06 mg/L TP). Groundwater seepage and internal recycling were not considered in the TMDL, and internal recycling may comprise substantial portions of the lake's TP loading (calculated as 82 % for the study years by ERD 2017). Surface runoff was calculated as 5 % of the TP loading input to the lake (ERD 2017) over the study period.

ERD-recommended potential management strategies for Lake Yale include stormwater treatment systems for select drainage basins where runoff has elevated TP concentrations (Sub-Basins 12 and 13) and whole-lake sediment inactivation with alum that would also help control nutrient inputs from groundwater seepage. Other potential management strategies that could benefit the lake include the further investigation and remediation of elevated TP concentrations from Sub-Basin 14, in-lake revegetation, the use of swales and berms for future shoreline development, and refined aquatic vegetation control to minimize sediment additions. LCWA is evaluating the feasibility of a whole-lake alum treatment to inactivate sediments in a lake as large as Lake Yale. Projected costs are over $3.9 million (Hart 2017).

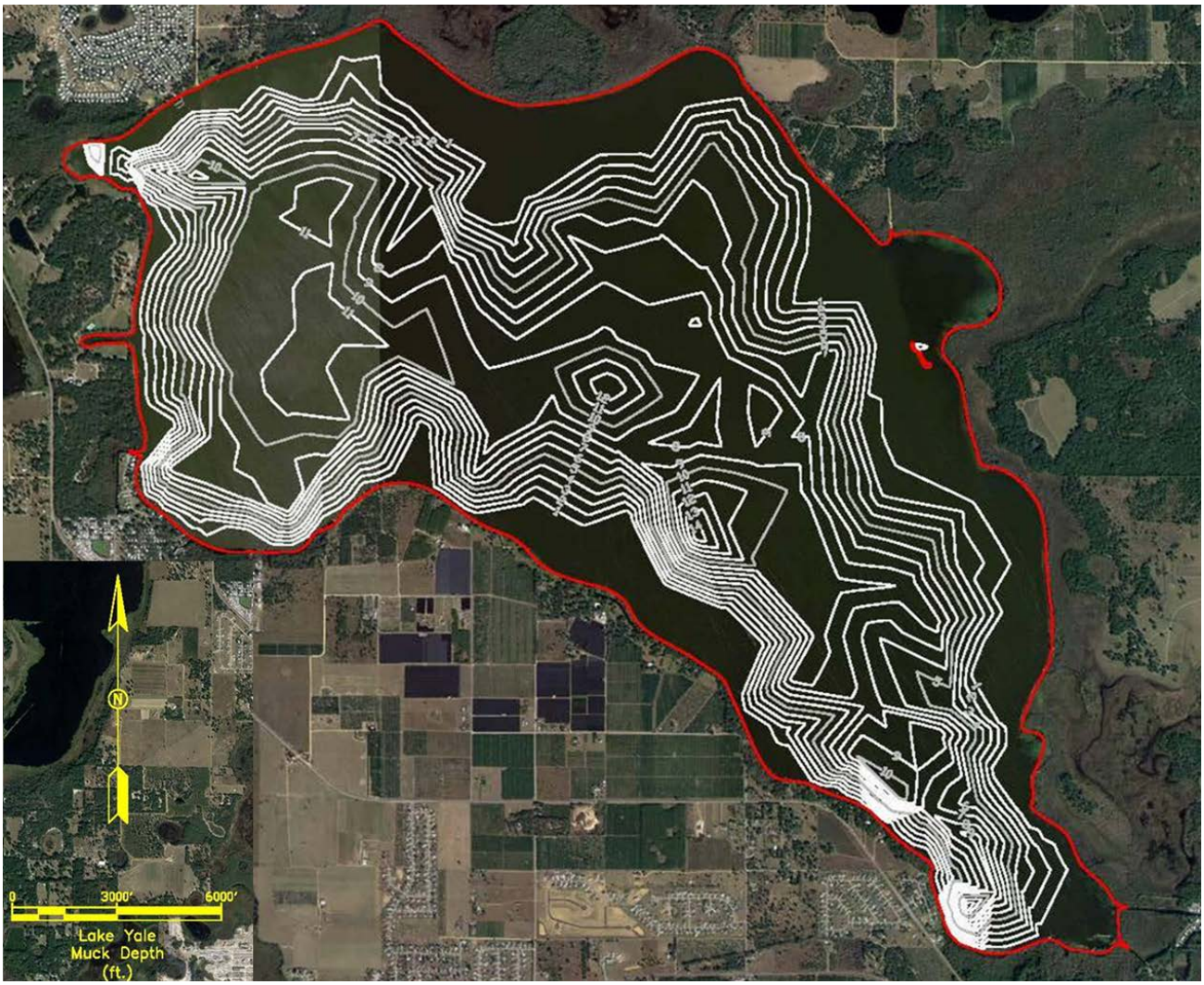

Figure 4. Depth of muck contours in Lake Yale

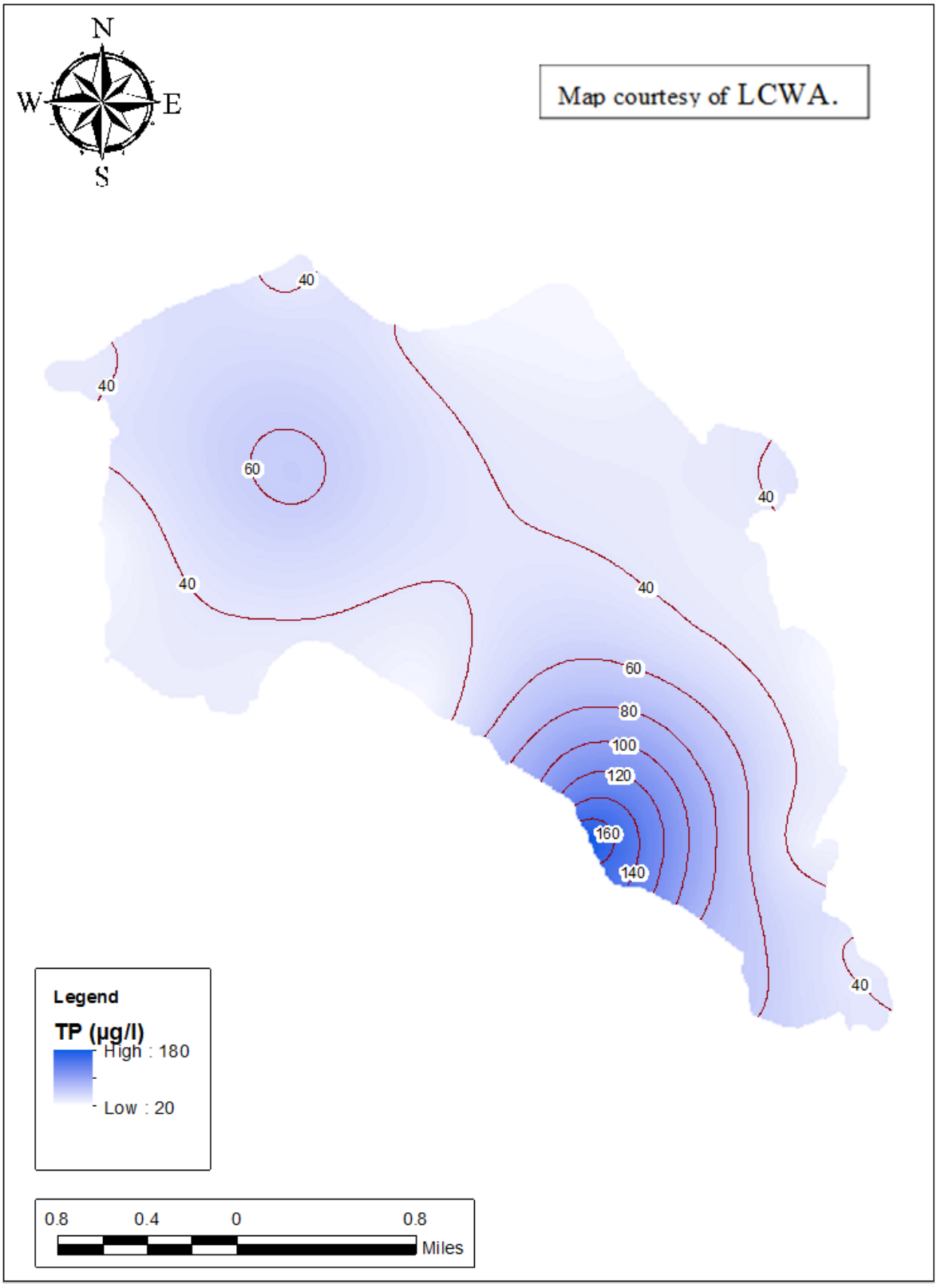

Figure 5. Isopleths of mean TP concentrations in groundwater seepage in Lake Yale

4.3.6 Lake Denham

Lake Denham is located to the southwest of Lake Harris and connected to Lake Harris by Helena Run. Wetlands occupy about half the lake's watershed area. The largest source of nutrient loading to the lake is the discharge from an historical agricultural area (muck farm). Internal nutrient loading by diffusive flux from benthic sediments accumulated in the lake is the second largest source. Leesburg had a wastewater sprayfield located in the basin, but it has ceased operation (Rhew 2017). The Villages, a large retirement community, is interested in developing residential housing in part of the basin.

A loading reduction of 911 kg-TP/yr (**Table B-11** in **Appendix B**) is needed to meet the TMDL of 593 kg-TP/yr. Of the total reduction, 126 kg-TP/yr are assigned to developed land uses. The remaining reduction is split between the internal recycling of nutrients and discharge from an historical agricultural area (a former muck farm). **Table 23** identifies the jurisdictions assigned a loading reduction for this waterbody.

LCWA is considering the purchase of this former agricultural area (Project Number DEN01). The project is assigned a high priority for completion. Placing the land into public ownership would enable the reduction or cessation of discharges, largely eliminating the loading to the lake. The property is located between conservation lands currently owned by LCWA. The removal of the discharge would also benefit water quality in Lake Harris downstream.

Table 23. Lake Denham required reductions and credits (kg-TP/yr) by jurisdiction

* If project credits are greater than the total required reduction, then the remaining developed land use reduction is 0.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits*	Remaining Developed Land Use Reduction to Be Achieved by 2022*	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027
FDOT	6	3	0	0	**3**	3	**6**
Lake County	26	13	2	0	**11**	13	**24**
Leesburg	91	46	7	0	**39**	45	**85**
Wildwood	3	1	0	0	**1**	2	**3**
Muck Farm–LCWA	421	210	0	500	**0**	211	**0**
Total	**547**	**273**	**9**	**500**	**54**	**274**	**118**

4.3.7 Marshall Lake

Marshall Lake is a small lake located in the larger Lake Apopka Basin. Its drainage area includes a portion of the City of Apopka, a portion of Orange County, and portions of U.S. Highway 441 and State Road (SR) 451.

Developed urban land is the major source of nutrient loading, with high-density residential and high-density commercial development as the primary sources. Agriculture is also present and provides an average loading comparable to high-density residential development (Kang 2017b).

A loading reduction of 213 kg-TP/yr (**Table B-12** in **Appendix B**) is needed to meet the TMDL of 97 kg-TP/yr. **Table 24** lists the jurisdictions assigned a loading reduction for this waterbody. For developed land uses, education credits and projects will achieve close to 10 kg-TP/yr in reductions, leaving 170 kg-TP/yr to be addressed by local jurisdiction projects. During its construction, compensating storage for SR 451 was created as a series of dry retention ponds and one wet detention pond, as well as dry swales to maximize the treatment of stormwater before discharge to Marshall Lake. Post-project runoff rates cannot not exceed pre-project discharge rates for the lake.

Suggested potential management strategies to address the deficit in reductions are the implementation of in-lake stormwater treatment BMPs, regional stormwater treatment, agricultural BMPs, and residential and commercial fertilizer BMPs directed toward reducing the amount of fertilizer used.

Table 24. Marshall Lake required reductions and credits (kg-TP/yr) by jurisdiction

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction to Be Achieved by 2022	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027
Apopka	135	67	7	0	**60**	68	**128**
Orange County	23	11	1	0	**10**	12	**22**
FDOT	7	4	0	0	**4**	3	**7**
Central Florida Expressway Authority	15	8	0	2	**6**	7	**13**
Total	**180**	**90**	**8**	**2**	**80**	**90**	**170**

4.3.8 Lake Roberts

Lake Roberts is a small lake located in the Lake Apopka Basin. Its drainage area includes portions of Winter Garden and Orange County. Overall anthropogenic land uses occupy 67 % of the lake's total basin area (Kang 2017a).

Primary anthropogenic sources of TP loading are medium-density residential land use and seepage from groundwater and septic systems. Loading from septic systems is included as part of groundwater seepage into the lake. Agricultural loading inputs are small.

A loading reduction of 39 kg-TP/yr (**Table B-13** in **Appendix B**) is needed to meet the TMDL of 100 kg-TP/yr. The total reduction includes reductions for developed land uses (19 kg-TP/yr)

and groundwater loading (18 kg-TP/yr). **Table 25** identifies the jurisdictions assigned a loading reduction for the waterbody. Education credits will achieve close to 2 kg-TP/yr in reductions, leaving 35 kg-TP/yr to be addressed by projects by local jurisdictions. Suggested potential management strategies to address the deficit are the implementation of in-lake stormwater treatment BMPs, regional stormwater treatment, and residential fertilizer and septic system BMPs.

OCEPD's contractor is reviewing the historical BMP recommendations for constructability as part of a broader BMP feasibility study. The study will also address the efficacy and cost-effectiveness of potential BMPs in rights-of-way owned by the county. In addition, the contractor is exploring the efficacy, longevity, and potential costs of a whole-lake or "hot spot" in-lake alum treatment. It should be noted that there is a potential for land to be annexed into the City of Winter Garden from unincorporated Orange County. Should the annexation occur, the current nutrient load allocations assigned to Orange County and the City of Winter Garden by DEP will change commensurately, as will any changes to the loads resulting from changes in land use in the annexed areas.

Table 25. Lake Roberts required reductions and credits (kg-TP/yr) by jurisdiction

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Required Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction to Be Achieved by 2022	Second 5-Year 50 % Required Developed Land Use Reduction	Remaining Required Developed Land Use Reduction to Be Achieved by 2027
Orange County	24	12	1	0	**11**	12	**22**
Winter Garden	14	7	1	0	**6**	7	**13**
Total	**38**	**19**	**2**	**0**	**17**	**19**	**35**

Chapter 5: Commitment to Plan Implementation

5.1 Adoption Process

This Amendment is adopted by Secretarial Order and assigns TP loading reductions to local governments, Central Florida Expressway Authority, Florida Turnpike Enterprise, and FDOT in the Palatlakaha River, Lake Harris, Lake Carlton, Trout Lake, Lake Yale, Lake Denham, Marshall Lake, and Lake Roberts Watersheds.

5.2 Tracking Reductions

The required loading reductions are expected to be met by 2027. Each entity responsible for implementing management strategies as part of the BMAP will provide DEP with an annual update of progress made in implementing loading reductions that will be included with DEP's statewide annual BMAP report. The update will track the implementation status of the water quality improvement projects listed in the BMAP and document additional projects undertaken to further water quality improvements in the basin. FDACS will continue to report the acreage enrolled in NOIs at least annually to DEP. Agricultural BMP–associated reductions are tracked as part of the nutrient budget for each waterbody.

Overall loading reductions assigned to a jurisdiction are the sum of reductions for developed land and, where present, septic systems within 200 meters of the waterbody shoreline or tributary shoreline. The reduction of loadings is expected to occur throughout the 10-year period, with specific targets for developed land uses for each 5-year period. The reduction of loading assigned to septic systems is to be achieved by 2027, though that reduction does not have to be specific to septic systems.

The status of the achievement of loading reductions is anticipated to be reevaluated in 2022. Upstream loading reductions as they apply to priority waterbodies and 2017 adopted TMDLs will be included with that evaluation.

5.3 Revisions to the BMAP

Adaptive management involves setting up a mechanism for making course corrections in the BMAP when circumstances change or feedback mechanisms indicate that a more effective strategy is needed. The FWRA requires that the plan be revised, as appropriate, in collaboration with basin stakeholders. All or part of a revised BMAP must be adopted by Secretarial Order. Adaptive management measures include the following:

- Procedures to determine whether additional cooperative actions are needed.
- Criteria/process for determining whether and when plan components need to be revised because of changes in costs, environmental impacts, social effects, watershed conditions, or other factors.

- Descriptions of the role for the Basin Working Group (BWG) after BMAP completion.

Tracking implementation, monitoring water quality and pollutant loads, and holding periodic BWG meetings to share information and expertise are key components of adaptive management.

Appendices

Appendix A. GIS Database Development

The initial allocation of loadings was made to each waterbody's hydrologic delineation of the surface water runoff contributing area or watershed. Models used for TMDL development estimated loadings by aggregating loading sources for each sub-basin in a TMDL watershed. The allocation of loading reductions to local jurisdictions necessitated the assignment of watershed loadings by jurisdictional boundaries, requiring the redistribution of loadings and the creation of a technique for achieving that distribution.

The first step in the process was the creation of a GIS database containing land use data for the Upper Ocklawaha Basin from both 1995 and 2009. Including data for both years allowed changes in land use to be tracked. Large enough changes in land use had occurred, as well as concerns with the overprediction of future loadings, to warrant the updating of TMDL models with 2009 land use. Land use data were obtained from the interpretation of aerial imagery and were aggregated for TMDL modeling and BMAP allocation purposes using combinations of FLUCCS categories. **Table A-1** summarizes the land use codes used for allocating reductions in the Palatlakaha Basin. **Table A-2** summarizes the land use codes used for allocating reductions in the Harris Chain of Lakes.

SJRWMD provided delineations of wastewater treatment plant sprayfields and active muck farms and historical muck farms now owned by the district as restoration areas that were used in the calculation of PLRGs by SJRWMD and subsequent TMDLs by DEP. **Figure 1** shows the locations of these features. Parcels of land delineated as sprayfield or muck farm/restoration area were categorized for modeling purposes by those designations and not the underlying FLUCCS categories.

SJRWMD suppled the delineations of the Lake Apopka Watershed and the Harris Chain of Lakes Sub-Basin. These boundaries overlapped in places along the Little Lake Harris and Lake Beauclair Watersheds and were reconciled by giving priority to the Harris Chain of Lakes for boundary location, because Lake Apopka's loading inputs were not allocated.

The Harris Chain of Lakes Sub-Basin contains individual lake watersheds used for PLRG and TMDL modeling. Each lake watershed is further subdivided into subwatersheds. Subwatersheds that are internally drained and do not contribute surface water runoff were not included in the modeling and were not included as part of the watershed area used to partition percent land use to jurisdictions.

DEP delineated the impaired segment of the Palatlakaha River (WBID 2839). It does not include the surface area of Lakes Minneola, Hiawatha, Lucy, Cherry, and Wilson. Wetlands located at the mouth of the river into Lake Harris were included in both DEP's delineation of the Palatlakaha River and in SJRWMD's delineation of the Lake Harris Watershed. This section of

the Palatlakaha River was included in both watershed land use updates to maintain the comparability to the original TMDL modeling.

Jurisdiction boundaries for Lake County were supplied by the Lake County Planning Department and are current as of December 2015. Jurisdictional boundaries for Orange County dated March 1, 2017, were supplied by the Orange County GIS Division. Unincorporated areas (outside a jurisdiction) were assigned to the county where they were located. Jurisdictional boundaries for cities outside Lake County and Orange County (Wildwood) were obtained from the TIGER 2010 Places Database. FDOT District 5 provided the delineation of the state roadways that it maintains, as well as stormwater management areas.

Once land use data were combined with the location of sprayfields and restoration areas, the Harris Chain of Lakes data were clipped from the larger Ocklawaha Basin. The Palatlakaha River (WBID 2839) was clipped from the larger Ocklawaha Basin separately from the Harris Chain of Lakes. Jurisdictional boundaries were added to the clipped data layers.

The allocated land use category was assigned to each polygon in the database, as presented in **Table A-1** for the Palatlakaha River Watershed and in **Table A-2** for the Harris Chain of Lakes Watershed. Sprayfields were assigned to the jurisdiction where they were located. The final Palatlakaha River data layer contains 4,553 individual polygons, each with a unique combination of land use, jurisdiction, and modeled and allocated land use category. The final Harris Chain of Lakes data layer contains 26,428 individual polygons, each with a unique combination of land use, modeled and allocated land use category, jurisdiction, and impaired waterbody name.

Lake Denham is a subwatershed of the Lake Harris Watershed. The Lake Denham Watershed was clipped from the final Harris Chain of Lakes data layer to provide the data used for calculating loading reductions.

Marshall Lake and Lake Roberts are subwatersheds within the Lake Apopka Watershed. Orange County city jurisdiction boundaries within the Lake Apopka Watershed land use layer were updated with 2017 data provided by Orange County GIS Division. Transportation land use for Marshall Lake is managed by FDOT and the Central Florida Expressway Authority and was assigned to the respective authority based on roadway name. The Marshall Lake and Lake Roberts Watersheds were clipped from the updated Lake Apopka Watershed layer to create separate data layers for each lake.

Table A-1. Summary of land use aggregations for the Palatlakaha River Basin

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Agricultural Land Uses	Agriculture	2110	2,844.0
Agricultural Land Uses	Agriculture	2120	740.9
Agricultural Land Uses	Agriculture	2130	270.9
Agricultural Land Uses	Agriculture	2140	13.6
Agricultural Land Uses	Agriculture	2150	640.7
Agricultural Land Uses	Agriculture	2210	898.3
Agricultural Land Uses	Agriculture	2240	15.7
Agricultural Land Uses	Agriculture	2410	334.5
Agricultural Land Uses	Agriculture	2430	205.3
Agricultural Land Uses	Agriculture	2500	12.9
Agricultural Land Uses	Agriculture	2510	42.7
Developed Land Use-High	High density residential	1300	1,171.0
Developed Land Use-High	High density residential	1390	378.8
Developed Land Use-Low	Low density residential	1100	613.7
Developed Land Use-Low	Low density residential	1180	666.8
Developed Land Use-Low	Low density residential	1190	24.7
Developed Land Use-Low	Urban Open Land	1400	241.6
Developed Land Use-Low	Urban Open Land	1490	23.8
Developed Land Use-Low	Urban Open Land	1510	16.0
Developed Land Use-Low	Urban Open Land	1520	21.2
Developed Land Use-Low	Urban Open Land	1550	44.3
Developed Land Use-Low	Urban Open Land	1600	3.3
Developed Land Use-Low	Urban Open Land	1620	165.6
Developed Land Use-Low	Urban Open Land	1650	4.1
Developed Land Use-Low	Urban Open Land	1660	6.0
Developed Land Use-Low	Urban Open Land	1670	80.9
Developed Land Use-Low	Urban Open Land	1700	322.4
Developed Land Use-Low	Urban Open Land	1800	11.0
Developed Land Use-Low	Urban Open Land	1810	1.3
Developed Land Use-Low	Urban Open Land	1820	771.3
Developed Land Use-Low	Urban Open Land	1840	16.9
Developed Land Use-Low	Urban Open Land	1850	42.9
Developed Land Use-Low	Urban Open Land	1860	52.9
Developed Land Use-Low	Urban Open Land	1900	122.6
Developed Land Use-Low	Urban Open Land	1920	92.5
Developed Land Use-Medium	Medium density residential	1200	1,914.4
Developed Land Use-Medium	Medium density residential	1290	66.1
Developed Land Use-Medium	Communication and Transportation	8130	8.5
Developed Land Use-Medium	Communication and Transportation	8140	202.6
Developed Land Use-Medium	Communication and Transportation	8180	7.8

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Developed Land Use-Medium	Communication and Transportation	8310	2.0
Developed Land Use-Medium	Communication and Transportation	8320	29.2
Developed Land Use-Medium	Communication and Transportation	8330	9.0
Developed Land Use-Medium	Communication and Transportation	8340	33.9
Developed Land Use-Medium	Communication and Transportation	8350	2.8
Developed Land Use-Medium	Communication and Transportation	8370	101.1
Natural Land Uses	Forest, Rural Open	4110	6.2
Natural Land Uses	Forest, Rural Open	4120	17.3
Natural Land Uses	Forest, Rural Open	4200	367.6
Natural Land Uses	Forest, Rural Open	4340	881.8
Natural Land Uses	Forest, Rural Open	4410	857.3
Natural Land Uses	Forest, Rural Open	4430	123.7
Natural Land Uses	Open water or wetlands	5100	121.4
Natural Land Uses	Open water or wetlands	5200	733.9
Natural Land Uses	Open water or wetlands	5250	135.4
Natural Land Uses	Open water or wetlands	5300	339.0
Natural Land Uses	Open water or wetlands	6110	15.4
Natural Land Uses	Open water or wetlands	6170	3.1
Natural Land Uses	Open water or wetlands	6210	209.8
Natural Land Uses	Open water or wetlands	6250	3.7
Natural Land Uses	Open water or wetlands	6300	559.6
Natural Land Uses	Open water or wetlands	6410	4,938.8
Natural Land Uses	Open water or wetlands	6430	379.4
Natural Land Uses	Open water or wetlands	6440	175.5
Natural Land Uses	Open water or wetlands	6460	728.4
Natural Land Uses	Rangeland	3100	222.2
Natural Land Uses	Rangeland	3200	39.2
Natural Land Uses	Rangeland	3300	149.6
Natural Land Uses	Rangeland	7400	28.3
Natural Land Uses	Rangeland	7410	31.8

Table A-2. Summary of land use aggregations for the Harris Chain of Lakes

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Agriculture activities	Cropland	2140	221.0
Agriculture activities	Cropland	2150	3,492.9
Agriculture activities	Cropland	2160	39.8
Agriculture activities	Cropland	2600	1.0
Agriculture activities	Feeding operations	2310	22.9
Agriculture activities	Feeding operations	2500	5.3
Agriculture activities	Feeding operations	2520	119.5
Agriculture activities	Other agriculture	1820	542.4
Agriculture activities	Other agriculture	2400	49.7
Agriculture activities	Other agriculture	2410	97.2
Agriculture activities	Other agriculture	2420	11.5
Agriculture activities	Other agriculture	2430	661.2
Agriculture activities	Other agriculture	2431	337.4
Agriculture activities	Other agriculture	2432	19.9
Agriculture activities	Pasture	2110	8,439.8
Agriculture activities	Pasture	2120	1,030.3
Agriculture activities	Pasture	2130	912.2
Agriculture activities	Pasture	2510	850.4
Agriculture activities	Tree crops	2200	96.4
Agriculture activities	Tree crops	2210	5,475.1
Developed Land Use-High	High density commercial	1400	3,138.4
Developed Land Use-High	High density commercial	1490	19.5
Developed Land Use-High	High density commercial	8110	346.5
Developed Land Use-High	High density commercial	8120	5.1
Developed Land Use-High	High density commercial	8140	534.0
Developed Land Use-High	High density commercial	8160	6.0
Developed Land Use-High	High density commercial	8180	21.4
Developed Land Use-High	High density residential	1300	4,209.0
Developed Land Use-High	High density residential	1390	257.7
Developed Land Use-High	Industrial	1510	162.0
Developed Land Use-High	Industrial	1550	611.3
Developed Land Use-High	Industrial	1560	97.0
Developed Land Use-High	Industrial	1562	164.5
Developed Land Use-High	Industrial	1590	19.4
Developed Land Use-Low	Low density residential	1100	6,066.5
Developed Land Use-Low	Low density residential	1180	2,939.3
Developed Land Use-Low	Low density residential	1190	199.3
Developed Land Use-Low	Mining	1600	5.4
Developed Land Use-Low	Mining	1611	39.0
Muck farm or restoration area	Muck Farm	2150	9,030.7

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Open water or wetlands	Water	5100	1,161.3
Open water or wetlands	Water	5200	49,226.8
Open water or wetlands	Water	5250	39.8
Open water or wetlands	Water	5300	351.5
Open water or wetlands	Water	5500	2.3
Open water or wetlands	Wetlands	6110	1,569.1
Open water or wetlands	Wetlands	6170	7,043.5
Developed Land Use-Low	Mining	1620	72.9
Developed Land Use-Low	Mining	1632	132.9
Developed Land Use-Low	Mining	1633	92.1
Developed Land Use-Low	Mining	1650	198.6
Developed Land Use-Low	Mining	1660	158.1
Developed Land Use-Low	Mining	1670	9.6
Developed Land Use-Low	Open land/recreation	1480	100.8
Developed Land Use-Low	Open land/recreation	1800	92.8
Developed Land Use-Low	Open land/recreation	1850	285.9
Developed Land Use-Low	Open land/recreation	1860	151.7
Developed Land Use-Low	Open land/recreation	1890	5.4
Developed Land Use-Low	Open land/recreation	1900	206.9
Developed Land Use-Low	Open land/recreation	1920	1,960.7
Developed Land Use-Low	Open land/recreation	7400	82.7
Developed Land Use-Low	Open land/recreation	7410	281.8
Developed Land Use-Low	Open land/recreation	7430	29.0
Developed Land Use-Low	Sprayfield	2150	1,931.3
Developed Land Use-Medium	Low density commercial/ institutional	1700	1,159.7
Developed Land Use-Medium	Low density commercial/ institutional	1840	96.1
Developed Land Use-Medium	Low density commercial/ institutional	8200	19.0
Developed Land Use-Medium	Low density commercial/ institutional	8310	19.5
Developed Land Use-Medium	Low density commercial/ institutional	8320	167.3
Developed Land Use-Medium	Low density commercial/ institutional	8330	19.3
Developed Land Use-Medium	Low density commercial/ institutional	8340	74.0
Developed Land Use-Medium	Low density commercial/ institutional	8350	367.2
Developed Land Use-Medium	Low density commercial/ institutional	8370	109.6
Developed Land Use-Medium	Medium density residential	1200	10,524.5
Developed Land Use-Medium	Medium density residential	1290	549.4
Forest, range, or open land	Forest/Rangeland	2240	78.7
Forest, range, or open land	Forest/Rangeland	3100	1,973.1
Forest, range, or open land	Forest/Rangeland	3200	658.6
Forest, range, or open land	Forest/Rangeland	3300	884.6
Forest, range, or open land	Forest/Rangeland	4110	1,864.5
Forest, range, or open land	Forest/Rangeland	4120	77.7

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Forest, range, or open land	Forest/Rangeland	4130	181.5
Forest, range, or open land	Forest/Rangeland	4200	886.0
Forest, range, or open land	Forest/Rangeland	4210	118.9
Forest, range, or open land	Forest/Rangeland	4340	10,672.0
Forest, range, or open land	Forest/Rangeland	4410	2,907.3
Forest, range, or open land	Forest/Rangeland	4430	341.6
Open water or wetlands	Wetlands	6210	318.8
Open water or wetlands	Wetlands	6220	130.7
Open water or wetlands	Wetlands	6250	1,129.4
Open water or wetlands	Wetlands	6300	6,432.2
Open water or wetlands	Wetlands	6410	7,011.0
Open water or wetlands	Wetlands	6430	1,388.8
Open water or wetlands	Wetlands	6440	763.7
Open water or wetlands	Wetlands	6460	6,572.0

Appendix B. Nutrient Budgets by Watershed

Individual waterbody nutrient budgets for Lake Apopka, Lake Beauclair, Lake Dora, Lake Eustis, and Lake Griffin include credit adjustments for the implementation of agricultural BMPs and projects through December 2017. The nutrient budgets listed for Trout Lake, Lake Carlton, Lake Harris, Lake Yale, Palatlakaha River, Lake Denham, Lake Marshall, and Lake Roberts do not include credits for agricultural BMPs and water quality improvement projects. Their purpose is to show how reductions were calculated and apportioned between sources. The summary tables for each waterbody in **Chapter 4** calculate the credits achieved by each entity and the total reductions achieved for developed land uses for that waterbody. **Tables B-1** through **B-13** list the nutrient budgets by waterbody.

Table B-1. Lake Apopka TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses. Agricultural BMPs are being used in the watershed, but agricultural loadings could not be separated from other stormwater loadings.

Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1989–94)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
Apopka Spring	2,208				2,208	
Muck Farm Discharges	115,686	-115,686			0	
Apopka Restoration Areas	1,681	37,477	-27,263		11,895	
LAP09 Jones Ave. Regional Stormwater Pond			-296			
Atmospheric Deposition (Wet/Dry)	13,645				13,645	
Johns Lake		488		-488		
Point Sources	621	2,050			2,671	
Peat Mine (Inactive)	800	-800				
Stormwater Runoff[1]	3,856	-35	-4,831	-338	-1,348	
Natural Area Runoff						
Runoff from Developed Uses						
LAP14 SR 50 Basin G		3				
LAP15 SR 50 Basin H		-13				
LAP 16 SR 50 Basin I						
LAP18 Berg Dr. retrofit		-2				
LAP19 Water Street retrofit		-23				
LAP25 Pioneer Key Mobile Home Park			-62			
LAP30 SR 50 Basin 1 (L-4)			-12			
LAP31 SR 50 Basin 2 (L-7)			-16			
LAP32 SR 50 Basin 3 (M-10/11)			-27			
LAP33 SR 50 Basin 4 (N-2)			-2			
LAP36 FM:239535-2			-7			
LAP38 / Lake Clarice Pond			-1			
APOPKA01 Street Sweeping			-557			

Sources of TP Loading	TMDL Baseline Loading (1989–94)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
OCOEE01 Street Sweeping			-201			
DOT01 FDOT Street Sweeping			-53			
DOT03-LAP Fertilizer Cessation			-2,607			
WNTRGAR01 Street Sweeping			-1,286			
Seepage/Groundwater						
Septic Systems						
Margin of Safety		1,168			1,168	
Total	**138,497**	**-75,338**	**-32,094**	**-826**	**30,239**	**35,052**

Table B-2. Lake Beauclair TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
Muck Farm Discharges	1,702				1,702	
Muck Farm 1 (Active)	1,702					
Atmospheric Deposition (Wet/Dry)	311				311	
Discharge from Lake Apopka	43,526	-26,011	-14,741		2,774	
Acquisition and Restoration on Lake Apopka		-26,011	-9,741			
Nutrient Reduction Facility (NuRF)			-5,000			
BCL02 Suction Dredging of West Beauclair						
ABC02 Lois Dr. Baffle Box						
Discharge from Lake Dora	15	-4	-5		6	
Point Sources						
Stormwater Runoff [1]	934		-460	23	687	
Natural Area Runoff	361			-37	324	
Agricultural Runoff	323		-42	65	346	
Agricultural BMPs			-42			
Golf Course Stormwater Runoff				10	10	
Runoff from Developed Uses	250		-228	-15	7	
DOT02-CARL FDOT Swale Maintenance						
DOT03-CARL Fertilizer Cessation			-206			
LC09-CARL Catch Basin and Pipe Cleaning			-3			
Education ORANGE09-BCL, LC05-BCL			-13			
Education ORANGE09-CARL, LC05-CARL, DOT04-CARL			-6			
Seepage/Groundwater						
Septic Systems	129			49	178	
Package Plants	64			19	83	
Total	**46,681**	**-26,015**	**-15,244**	**91**	**5,741**	**7,056**

Table B-3. Lake Dora TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
Atmospheric Deposition (Wet/Dry)	1,267				1,267	
Discharge from Lake Beauclair	36,015	-20,072	-11,554	71	4,428	
Discharge from Lake Eustis	14		-1		13	
Point Sources				1	1	
Stormwater Runoff[1]	2,121	10	-1,472	-348	256	
Natural Area Runoff	326			-81	245	
Agricultural Runoff	24		-3	17	38	
Agricultural BMPs			-3			
Golf Course Stormwater Runoff				4	4	
Runoff from Developed Uses	1,771	10	-1,524	-288	-31	
DOR09 SR 19 in Tavares-System I		2				
DOR04 SR 500/US 441 Basin 300A		-3				
DORA05 SR 500 US 441-Basin 300A, B, C, D		11				
DORA19 Nutrient-Separating Baffle Box (NSBB) Gilbert Park			-2			
DORA20			-2			
DORA22 NSBB at 4th Ave. and Lakefront			-6			
DORA23 Flexstorm Inlet Filters			-15			
DORA24 NSBB at Grandview St. and Johns St.			-5			
DORA25 NSBB at 5th Ave. and Rossiter St.			-6			
DORA26/StormX Gross Pollutant Traps			-6			
DORA27 Continuous Deflective Separation (CDS) Unit at Lake Dora Rd.			-4			
DORA28 NSBB at 4th Ave. and Donnelly St.			-2			
DORA29 NSBB at 3rd Ave. and McDonald St.			-5			
DORA31 CDS Unit at Old Eustis Rd. and Overlook Rd.			-1			

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
DORA32 Underground Stormwater Treatment System at 6th Ave. and Baker St.			-20			
DORA35 City of Mount Dora MS4 System			-82			
MTDORA01 Street Sweeping			-685			
DOT01/FDOT Street Sweeping (E5Q71 Contract No)			-32			
DOT03-DORA Fertilizer Cessation			-96			
Tavares01 Street Sweeping			-88			
Tavares02 Baffle Boxes			-252			
Tavares04-DORA Stormwater Improvement			-104			
LC09-DORA Catch Basin and Pipe Cleaning			-57			
Education DOT034-DORA, EUSTIS02-DORS, LC05-DORA, Orange09-DORA, TAVARES03-DORA			-56			
Seepage/Groundwater						
Septic Systems	412			33	445	
Package Plants						
Total	**39,829**	**-20,062**	**-13,113**	**-244**	**6,410**	**13,230**

Table B-4. Lake Eustis TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
Muck Farm Discharges	1,195	-647	-373		175	
Muck Farm 2 (Inactive)	647	-647			0	
Muck Farm 3 (Inactive)	548		-373		175	
Restoration Area Discharges	1,055	-438	-142		475	
Pine Meadows Restoration Area	1,055	-438	-142		475	
Atmospheric Deposition (Wet/Dry)	2,251				2,251	
Discharge from Lake Dora	19,093	-9,617	-6,244	-116	3,074	
Discharge from Lake Harris	6,286	-1,157	-1,597	557	4,023	
Point Sources				15	15	
Stormwater Runoff[1]	3,769	-315	-3,489	437	103	
Natural Area Runoff	951			41	992	
Agricultural Runoff	139		-5	32	166	
Agricultural BMPs			-5			
Golf Course Stormwater Runoff				7	7	
Runoff from Developed Uses	2,679	-315	-3,783	357	-1,062	
DOR10 SR 19 in Tavares-System II		-1				
DOR11 SR 19 in Tavares-System III		-8				
EUS02 Haynes Creek Park Retrofit		-6				
EUS06 Eustis St./Ward Ave. Stormwater Facility		-36				
EUS07 Salem St. and Magnolia Ave. Retrofit		-63				
EUS08 South Grove St. and Palm Ave. Stormwater Facility		-32				
EUS09 Barnes Ave. and Center St. Retrofit		-5				
EUS10 Stevens Ave. Retrofit		-41				
EUS11 Russell Ave. Retrofit		-31				
EUS12 Hazzard Ave. Retrofit		-14				

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
EUS13 South Grove St. and Steven Ave. Retrofit			-14			
EUS14 SR 500 US 441-Basin A		-26				
EUS15 SR 500 US 441-Basin C		-4				
EUS16 SR 500 US 441-Basin D		1				
EUS17SR 500 US 441-Basin E		-15				
EUS18 SR 500 US 441-System C		-21				
EUS19 SR 19 in Tavares-System IV		-10				
EUS20 SR 500 US 441		-2				
EUS21 SR 500 US 441		-3				
EUS22 SR 500 US 441-System D		2				
EUS23 South Bay St. and Eustis St. Retrofit			-80			
EUS24 North Bay St. and Clifford Ave. Retrofit			-51			
EUS26 Lakeshore Drainage Improvement			-2			
EUS27 Bates Ave. Pond			-10			
EUS28 Downtown Stormwater Master Plan			-45			
EUS30 Orange Ave. Retrofit			-19			
EUSTIS01/Street Sweeping and Drainage Maintenance			-2			
TROUT06 Getford Rd. Stormwater Park			-143			
TROUT08/Hicks Ditch Hybrid Wetland			-1,920			
DOT01/FDOT Street Sweeping (E5Q71 Contract No)			-132			
UMATILLA03-Trout Street Sweeping			-61			
Tavares01-EUS Street Sweeping			-215			
Tavares02-EUS Baffle Boxes			-84			
EUSTIS01-TROUT Street Sweeping and Drainage Maintenance						
LC09-EUS Catch Basin and Pipe Cleaning			-3			
DOT01-TROUT FDOT Street Sweeping			-24			

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
DOT02-TROUT FDOT Swale Maintenance			-5			
DOT03-TROUT Fertilizer Cessation			-502			
Education TAVARES03-EUS, LEESBURG02-EUS, LC05-EUS, DOT04-EUS			-148			
Education EUSTIS02-TROUT, UMATILLA05-TROUT, LC05-TROUT, DOT04-TROUT			-28			
Seepage/Groundwater						
Septic Systems	436			955	1,391	
Package Plants	1,089			-179	910	
Total	**35,174**	**-12,174**	**-12,253**	**1,670**	**12,417**	**20,286**

Table B-5. Lake Griffin TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
Muck Farm Discharges	22,704	-22,704			0	
Restoration Area Discharges	23,899	-17,863	-960		5,076	
Harris Bayou			423		423	
Emeralda Marsh Restoration Area	23,899	-17,863	-1,383		4,653	
Atmospheric Deposition (Wet/Dry)	3,816				3,816	
Discharge from Lake Eustis	22,331	-7,729	-7,583	1,060	7,884	
Discharge from Lake Harris						
Discharge from Lake Yale	2				2	
Point Sources	20		-20		0	
Stormwater Runoff[1]	3,811	-190	-511	752	3,861	
Natural Area Runoff	1,103			585	1,688	
Agricultural Runoff	345		-12	-1	332	
Agricultural BMPs			-12			
Golf Course Stormwater Runoff				7	7	
Runoff from Developed Uses	2,363	-190	-511	161	1,823	
GRIF05 Lazy Oaks Retrofit		-19				
GRIF06 Griffwood Community Retrofit		-33				
GRIF07 Brittany Estates Retrofit		-13				
GRIF08 Canal St. Retrofit			-7			
GRIF10 Whispering Pines Reg SW Retrofit			-130			
GRIF13 SR 500/US 441 Basin 100			-55			
GRIF14 SR 500/US 441 Basin 200		-74				
GRIF15 SR 500 US 441-Basin 2		-10				
GRIF22 Mid-Florida Lake Mobile Home Park Retrofit		-42				
GRIF24 SR 500 US 441 Basin D			-15			

Sources of TP Loading	TMDL Baseline Loading (1991–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	Allowable Loading or Allocation
GRIF25 SR 500 US 441 Basin			-8			
GRIF26 SR 500 US 441 Basin			-8			
GRIF29/Lake Griffin Stormwater Improvements (Project Name Change)			-36			
GRIF30/Oak Terrace Dr. Detention			-30			
LADYL02 Street Sweeping			-8			
DOT01-GRIF FDOT Street Sweeping (E5Q71 Contract No)			-57			
LADYL02 Street Sweeping			-8			
MARION06 Street Sweeping			-1			
LC09-GRIF Catch Basin and Pipe Cleaning			-9			
Education MARION01-GRIF, LEESBURG02-GRIF, LC05-GRIF, FRUITLANDP02, DOT04-GRIF			-140			
Seepage/Groundwater						
Septic Systems	686			320	1,006	
Package Plants	1,205			439	1,644	
Total	**78,474**	**-48,487**	**-9,283**	**2,571**	**23,278**	**26,901**

Table B-6. Trout Lake TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1995–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	TMDL Controllable 2009 Loading	Controllable 2009 % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading or Allocation
Muck Farm Discharges									
Muck Farm 2 (Inactive)									
Muck Farm 3 (Inactive)	474		-19		455	455	28.7	424	32
Restoration Area Discharges									
Pine Meadows Restoration Area	1,266		-726		540	540	34.0	502	37
Atmospheric Deposition (Wet/Dry)	30				30				30
Point Sources									
Stormwater Runoff[1]	1,115			-150	966	584		544	422
Natural Area Runoff	376			6	382	0		0	382
Agricultural Runoff	124			-54	70	70	4.4	65	5
Agricultural BMPs									
Runoff from Developed Uses	616			-102	514	514	32.4	479	35
Developed Land Uses–High	332			-52	281	281	17.7	261	19
Developed Land Uses–Medium	265			-49	217	217	13.6	202	15
Developed Land Uses–Low	19			-1	17	17	1.1	16	1
Seepage/Groundwater									
Septic Systems	7				7	7	0	7	1
Total	**2,892**	**0**	**-745**	**-150**	**1,998**	**1,586**	**100**	**1,477**	**521**

Table B-7. Lake Carlton TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1995–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	TMDL Controllable 2009 Loading	Controllable 2009 % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading or Allocation
Atmospheric Deposition (Wet/Dry)	118				118	0		0	118
Point Sources									
Stormwater Runoff[1]	294			-4	290	221		215	75
Natural Area Runoff	76			-7	69	0		0	69
Agricultural Runoff	84			16	100	100	34.4	97	3
Agricultural BMPs									
Runoff from Developed Uses	134			-13	121	121		118	3
Developed–High					16	16	5.6	16	0
Developed–Medium					57	57	19.7	56	2
Developed–Low					48	48	16.4	46	1
Seepage/Groundwater									
Septic Systems Total	43			27	70	70	24.1	68	2
Septic Systems	29			25	54	54	18.6	53	2
Package Plants	14			2	16	16	5.5	16	0
Total	**455**	**0**	**0**	**23**	**478**	**291**	**100**	**283**	**195**

Table B-8. Lake Harris TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1995–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	TMDL Controllable 2009 Loading	Controllable 2009 % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading or Allocation
Spring Discharge	2,047				2,047				2,047
Muck Farm Discharges	174	-174				0		0	
Muck Farm 4 (Active)	1,827				1,827	1,827	14.8	574	1,253
Restoration Area Discharges									
Harris Bayou	6,907	-4,715	-2,193		-1	-1	0	0	0
Atmospheric Deposition (Wet/Dry)	5,422				5,422	0		0	5,422
Discharge from Lake Eustis	183		-99		84				84
Discharge from Palatlakaha River	3,891			695	4,586	4,586	37	1,440	3,146
Point Sources	121		-120		1	1	0	0	1
Stormwater Runoff[1]	5,287			749	6,036	3,783		1,188	4,848
Natural Area Runoff	2,211			42	2,253	0		0	2,253
Agricultural Runoff	372			116	475	475	3.9	149	326
Agricultural BMPs									
Land Conversion									
Golf Course Stormwater Runoff					13	13	0.1	4	9
Runoff from Developed Uses	2,704			591	3,295	3,295		1,035	2,260
Developed–High					2,206	2,206	17.8	693	1,513
Developed–Medium					805	805	6.5	253	552
Developed–Low					284	284	2.3	89	195
Seepage/Groundwater									
Septic Systems Total	1,232			959	2,191	2,191	17.7	688	1,503
Septic Systems	591			924	1,515	1,515	12.2	476	1,039
Package Plants	640			35	675	675	5.4	212	463
Total	**27,091**	**-4,889**	**-2,412**	**2,403**	**22,192**	**12,386**	**100**	**3,890**	**18,302**

Table B-9. Lake Yale TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1995–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	TMDL Controllable 2009 Loading	Controllable 2009 % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading or Allocation
Atmospheric Deposition (Wet/Dry)	1,443				1,443	0		0	1,443
Point Sources	141	-141			0	0			
Stormwater Runoff[1]	1,352			312	1,664			546	1,118
Natural Area Runoff	557			53	610	0		0	610
Agricultural Runoff	197			164	361	361	22.0	187	174
Agricultural BMPs									
Runoff from Developed Uses	598			95	693	693		359	334
Developed–High					460	460	28.1	238	222
Developed–Medium					185	185	11.3	96	89
Developed–Low					48	48	2.9	25	23
Seepage/Groundwater									
Septic Systems Total	292			294	586	586	35.8	303	283
Septic Systems	94			97	191	191	11.7	99	92
Package Plants	197			197	394	394	24.0	204	190
Total	**3,228**	**-141**	**0**	**606**	**3,692**	**1,640**	**100**	**848**	**2,844**

Table B-10. Palatlakaha River TP budget (lbs-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (1995–2000)	Load Change from Current Projects (through 2005)	Load Change from Future Projects (2005 on)	Load Change from Growth (2009 land uses)	Net TP Load	TMDL Controllable 2009 Loading	Controllable 2009 % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading or Allocation
Atmospheric Deposition (Wet/Dry)									
Point Sources									
Stormwater Runoff[1]	2,350			419	2,769			589	2,180
Natural Area Runoff	1,293			-244	1,049	0		0	1,049
Agricultural Runoff	370			44	414	414	24.1	142	272
Agricultural BMPs									
Runoff from Developed Uses	687			619	1,306	1,306	75.9	447	859
Developed–High					697	697	40.5	239	458
Developed–Medium					470	470	27.3	161	309
Developed–Low					139	139	8.1	48	92
Seepage/Groundwater	27				27	0			27
Septic Systems									
Total	**2,377**	**0**	**0**	**419**	**2,796**	**1,720**	**100**	**589**	**2,207**

Table B-11. Lake Denham TP budget (kg-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (2000–12)	Load Change from Current Projects (through 2016)	Load Change from Future Projects (2017 on)	Net TP Load	TMDL Controllable Loading	Controllable % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading[1] or Allocation
Atmospheric Deposition (Wet/Dry)	35			35	0		0	35
Point Sources								
Stormwater Runoff[1]	1,136			1,136	755		636	500
Natural Area Runoff	380			380	0		0	380
Agricultural Runoff	106			106	106	9.8	90	17
Runoff from Developed Uses	149			149	149	13.8	126	24
Developed–High	120			120	120	11.1	101	19
Developed–Medium	24			24	24	2.2	20	4
Developed–Low	5			5	5	0.5	4	1
Muck Farms	500			500	500	46.2	421	79
Seepage/Groundwater/Floridan	7			7	0		0	7
Internal Load	326			326	326	30.1	275	51
Total	**1,504**	**0**	**0**	**1,504**	**1,081**	**100**	**911**	**593**

Table B-12. Lake Marshall TP budget (kg-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (2000–12)	Load Change from Current Projects (through 2016)	Load Change from Future Projects (2017 on)	Net TP Load	TMDL Controllable Loading	Controllable % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading or Allocation
Atmospheric Deposition (Wet/Dry)	18			18	0		0	18
Point Sources								
Stormwater Runoff[1]	224			224	215		163	61
Natural Area Runoff	9			9	0		0	9
Agricultural Runoff	44			44	44	20.5	33	11
Runoff from Developed Uses	171			171	171	79.5	130	41
Developed–High	105			105	105	48.9	80	25
Developed–Medium	36			36	36	16.5	27	9
Developed–Low	1			1	1	0.5	1	0
Roadways	29			29	29	13.6	22	7
Seepage/Groundwater/Septic Systems	68			68	68		50	18
Total	**310**	**0**	**0**	**310**	**283**	**100**	**213**	**97**

Table B-13. Lake Roberts TP budget (kg-TP/yr)

[1] Stormwater runoff = Total of natural area + agriculture + developed uses.
Note: Negative values indicate a decrease in TP loading.

Sources of TP Loading	TMDL Baseline Loading (2000–12)	Load Change from Current Projects (through 2016)	Load Change from Future Projects (2017 on)	Net TP Load	TMDL Controllable Loading	Controllable % Contribution	Proportional Load Reduction Needed to Meet TMDL	Allowable Loading or Allocation
Atmospheric Deposition (Wet/Dry)	17			17	0		0	17
Point Sources								
Stormwater Runoff[1]	66			66	36		21	45
Natural Area Runoff	30			30	0		0	30
Agricultural Runoff	3			3	3	7.5	2	1
Runoff from Developed Uses	33			33	33	92.5	19	14
Developed–High	0			0	0	0.8	0	0
Developed–Medium	29			29	29	80.5	17	12
Developed–Low	4			4	4	11.2	2	2
Seepage/Groundwater/Septic Systems	56			56	56		18	38
Total	**139**	**0**	**0**	**139**	**36**	**100**	**39**	**100**

Appendix C. New Projects to Reduce Nutrient Sources (Not Previously Adopted)

In 2016, the Florida Legislature amended the FWRA (Section 403.067, F.S.), creating additional requirements for all new or revised BMAPs. BMAPs must now include planning-level details for each listed project, along with a proposed priority ranking for implementation and funding needs. Project status was selected as the most appropriate indicator of a project's priority ranking, based primarily on need for funding. The management strategies listed in **Table C-1** are ranked as high, medium, or low priority based on project status. Projects with "completed" status were assigned a low priority. Projects classified as "underway" were assigned a medium priority because some resources have been allocated to these projects, but additional assistance may be needed for completion. High priority was assigned to projects listed as "proposed" or "conceptual." These projects typically need to be funded and implemented to achieve substantial reductions, or studies need to be completed to appropriately plan for additional load reductions.

There are exceptions to the assignment of priority based on project status. For example, pollution prevention projects such as street sweeping and good housekeeping measures were assigned high priority, regardless of their status, because they are cost-effective and require continuing effort. Public outreach projects are high priority because they are an integral component of BMAPs and are focused on preventing nutrient pollution, which is much more economical than deploying treatment efforts.

Though Project DEN0 (highlighted in **Table C-1**), Lake Denham Muck Farm Buyout, is assigned a status of underway and, based on the prioritization scheme, would normally be medium priority, the project is a critical component in the restoration of Lake Denham and Lake Harris and is assigned a high priority.

Table C-1. New projects to reduce nutrient sources

TBD = To be determined; NA = Not applicable

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Apopka	APOPKA02-MARSHAL	Educational Outreach	Various educational activities that inform and guide citizens on importance of water as resource. Activities included presentations, newspaper articles, handouts, and mail-outs on topic of water conservation and stormwater runoff. Storm drain stenciling program that engages local volunteers. Informs residents of discharges into surface waters. Indirect benefit to Lake Apopka by reducing pollutant sources and runoff in watershed.	Education and Outreach Efforts	Lake Marshall Basin	Completed	14		7	
City of Apopka	LAP48	Harry St. Project	Drainage easement located off Harry St. in Apopka has become dumping ground. City is removing all garbage, debris, and litter. It is installing new fence to protect retention area and sodding hill slope to prevent erosion.	BMP Cleanout	Lake Apopka Basin	Underway	TBD	TBD		
City of Clermont	CLR03	Education and Outreach Activities	Pamphlets and website provide information to local residents. Adopted landscaping, irrigation, and pet waste management ordinances.	Education and Outreach Efforts	Palatlakaha River Basin	Completed	1			
City of Clermont	PAL25	12th St. and Lakeshore Dr. Stormwater Improvements	Project includes removing 3,500 square feet of impervious area subject to vehicular traffic and construction of dry retention pond to treat stormwater discharges from 8.72-acre contributing basin.	Structural BMPs–Quantified Load Reductions	Palatlakaha River Basin	Completed	7	46		

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Clermont	PAL26	Lake Winona Stormwater Improvements	Lake Ave. and Linden St. north of Lake Winona. Proposed project will treat runoff from 2 sub-basins, prior to discharge to Lake Winona using treatment train. Proposed treatment train includes source control (street sweeping), nutrient separating baffle box followed by retention (underground storm chambers at one outfall, and dry retention pond at second outfall).	Structural BMPs– Quantified Load Reductions	Palatlakaha River Basin	Completed	2	11		
City of Clermont	PAL27	Disston Ave. Stormwater Improvements	Lake Minnehaha, Disston Ave. south of Minnehaha Ave., Clermont. Project consists of 50 underground concrete chambers that hold stormwater, allowing it to percolate through sand and enter lake laterally. Sand acts as filter to remove unwanted nutrients. Underground chambers are preceded by baffle boxes that remove floatables, such as trash, leaves and grass, and sand. Combination of types of underground structures sufficiently cleans stormwater before it enters lake. Types of pollutant loadings targeted in existing stormwater discharge to Lake Minnehaha include TP and total suspended solids (TSS). Removes 1,991 lbs/yr of TSS. Project site allows for implementation of specific BMPs that will provide nutrient uptake and suspended solids settling. Infiltration systems are expected to reduce predicted loadings by 80 %.	Structural BMPs– Quantified Load Reductions	Palatlakaha River Basin	Completed	8			
City of Clermont	PAL29	Victory Pointe	Online wet detention BMP.	Structural BMPs– Load Reductions Not Quantified	Palatlakaha River Basin	Completed	41			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Clermont	PAL30	Drew Avenue and East Avenue	Drew Ave. and East Ave. project site is located on east shore of Lake Minnehaha in City of Clermont. Lake Minnehaha receives direct, untreated stormwater discharge from this 8.77-acre basin. Project will provide treatment of runoff from basin using treatment train. Proposed treatment train includes source control (street sweeping), followed by NSBB, followed by retention. Proposed retention is underground. Treats stormwater before entering Lake Minnehaha, which discharges to Lake Minneola and downstream Palatlakaha River. Removes 1,116 lbs/yr of TSS. Hydrocarbons absorbed by Storm Boom.	BMP Treatment Train	Palatlakaha River Basin	Completed	8	62		
City of Eustis	EUS29	Westmoreland Retrofit	Proposed new stormwater pond for collection on Westmoreland; modified to conveyance system; no pond installed.	Structural BMPs – Load Reductions Not Quantified	Lake Eustis Basin	Cancelled				
City of Eustis	EUS31	Ardice Ave. – Kurt and Ruleme Improvements	Storm piping along Ardice Ave. to Kurt and Ruleme St. will be constructed and routed to stormwater pond maintained by city.	Structural BMPs – Load Reductions Not Quantified	Lake Eustis Basin	Underway				
City of Eustis	EUS32	Bates Ave. Sewer Master Lift Station Upgrade	Upgrade will include addition of bar screen, fixture replacement, and coating.	Wastewater Infrastructure Management	Lake Eustis Basin	Planned				
City of Eustis	EUS33	Florida Food Products (FFP) Inc. for City to Provide Sewage Treatment Services	In attempt to decrease its sprayfield burden, FFP has petitioned city to accept some excess process waters for treatment. In spirit of being "good neighbor," city wastewater department has accepted FFP discharge waters in increasing step-feed manner for testing, analysis, and treatment viability.	Wastewater Infrastructure Management	Lake Eustis Basin	Completed				

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Eustis	EUS34	Ferran Park Parking Lot	Parking lot was constructed along with its drainage.	Structural BMP – Load Reductions Not Quantified	Lake Eustis Basin	Completed				
City of Eustis	EUS35	Lakeview Ave. Sewer Line Replacement	Project will replace all damaged sewer lines, removing TN seepage upstream from Lake Eustis.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Lake Eustis Basin	Underway				
City of Eustis	EUS36	Woodward Ave.	Project will replace all damaged manholes/sewer lines along street, removing TN seepage upstream from Lake Eustis.	Sanitary Sewer and WWTF Maintenance	Lake Eustis Basin	Planned				
City of Eustis	EUSTIS02-YALE	Support of Watershed Action Volunteers (WAV) Program	Eustis is partner and financial supporter of WAV Program. WAV provides assistance to city with implementation of educational programs and water quality monitoring to support Eustis MS4 permit.	Education and Outreach Efforts	Lake Eustis Basin	Completed	13.8	NA		
City of Eustis	EUSTIS02-DORA	Support of WAV Program	Eustis is partner and financial supporter of WAV Program. WAV provides assistance to city with implementation of educational programs and water quality monitoring to support Eustis MS4 permit.	Education and Outreach Efforts	Lake Eustis Basin	Completed	3.5	NA		
City of Eustis	EUSTIS02-TROUT	Support of WAV Program	Eustis is partner and financial supporter of WAV Program. WAV provides assistance to city with implementation of educational programs and water quality monitoring to support Eustis MS4 permit.	Education and Outreach Efforts	Lake Eustis Basin	Completed	13.7	NA		
City of Eustis	EUSTIS02-EUS	Support of WAV Program	Eustis is partner and financial supporter of WAV Program. WAV provides assistance to city with implementation of educational programs and water quality monitoring to support Eustis MS4 Permit.	Education and Outreach Efforts	Lake Eustis Basin	Completed	42	NA		

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Eustis	EUSTIS04	Sewer Line Replacement Idlewilde Dr., Lakeshore Dr., Mary St.	Project will replace all damaged sewer lines, removing TN seepage upstream from Lake Eustis.	Wastewater Infrastructure Management	Lake Eustis Basin	Completed				
FDACS with City of Eustis	TROUT08	Hicks Ditch Hybrid Wetland	Hybrid wetland treatment system will remove TN and TP loading to Hicks Ditch and Trout Lake. In dry season, system will also be used to treat water in canal connected to Trout Lake.	Structural BMPs – Quantified Load Reductions	Trout Lake Basin	Completed	2,214	23,946		
City of Fruitland Park	FRUITLANDP02	Fruitland Park NPDES Permit Education and Outreach	Landscaping, irrigation, fertilizer, and pet waste ordinances. City of Fruitland Park uses consultant for education and outreach. Activities include PSAs in cooperation with City of Leesburg and SJRWMD, distribution of pamphlets, educational website, illicit discharge inspection and education program, utility bill inserts, and informational displays for proper irrigation techniques and landscape management.	Education and Outreach Efforts	Lake Griffin Basin	Completed	8			
City of Groveland	GROVE02	Education and Outreach Activities	Pamphlets and website provide information to local residents. Adopted landscaping, irrigation, and fertilizer application ordinances.	Education and Outreach Efforts	Palatlakaha River Basin	Completed	8			
City of Leesburg	GRIF31	Birchwood Phase 2 and 3	Remove open ditch and enclosing pipes.	Structural BMPs – Load Reductions Not Quantified	Lake Griffin Basin	Planned				
City of Leesburg	GRIF32	Public Works	Baffle box.	Structural BMPs – Load Reductions Not Quantified	Lake Griffin Basin	Completed				
City of Leesburg	HAR25	PoBoys	Remove open ditch and enclose pipes located at U.S. Highway 27 and South St.	Structural BMPs – Load Reductions Not Quantified	Lake Harris Basin	Underway				

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Leesburg	HAR26	Palm Harbour Court	Redirect flow and add storage capacity to ditch system.	Structural BMPs – Load Reductions Not Quantified	Lake Harris Basin	Underway				
City of Leesburg	LEESBURG02-DEN	Education and Outreach Activities	PSAs on Lakefront TV, pamphlets, website, illicit connection reporting. City adopted ordinances for landscaping, fertilizer application, and pet waste management. Student and adult education programs.	Education and Outreach Efforts	Lake Denham Basin	Completed	14		7	
City of Leesburg	LEESBURG02-EUS	Education and Outreach Activities	PSAs on Lakefront TV, pamphlets, website, illicit connection reporting. City adopted ordinances for landscaping, fertilizer application, and pet waste management. Student and adult education programs.	Education and Outreach Efforts	Lake Eustis Basin	Completed	5			
City of Leesburg	LEESBURG02-GRIF	Education and Outreach Activities	PSAs on Lakefront TV, pamphlets, website, illicit connection reporting. City adopted ordinances for landscaping, fertilizer application, and pet waste management. Student and adult education programs.	Education and Outreach Efforts	Lake Griffin Basin	Completed	31			
City of Leesburg	LEESBURG02-HAR	Education and Outreach Activities	PSAs on Lakefront TV, pamphlets, website, illicit connection reporting. City adopted ordinances for landscaping, fertilizer application, and pet waste management. Student and adult education programs.	Education and Outreach Efforts	Lake Harris Basin	Completed	75			
City of Leesburg	LEESBURG02-PAL	Education and Outreach Activities	PSAs on Lakefront TV, pamphlets, website, illicit connection reporting. City adopted ordinances for landscaping, fertilizer application, and pet waste management. Student and adult education programs.	Education and Outreach Efforts	Palatlakaha River Basin	Completed	5			
City of Minneola	MINN01	Education Outreach	Implement MS4 permit outreach requirements for 1 % credit.	Education and Outreach Efforts	Palatlakaha River Basin	Completed	1			
City of Minneola	MINN02	Inlet Cleanout and Street Sweeping	Street sweeping and inlet cleanout. Removes sediments and debris from streets and prevents their entry into lakes.	Basic Stormwater Management Program Implementation	Palatlakaha River Basin	Completed	2			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Mount Dora	MTDORA02	Education Outreach	Education outreach to meet requirements of MS4 permit.	Education and Outreach Efforts	Lake Dora Basin	Completed	4			
City of Ocoee	LAP39	Ocoee Crown Point Subdivision	Retention BMPs.	Structural BMPs – Load Reductions Not Quantified	Lake Apopka Basin	Completed	NA	NA		
City of Ocoee	LAP40	Renaissance Charter School	Retention BMPs at West Rd., Ocoee.	Structural BMPs – Load Reductions Not Quantified	Lake Apopka Basin	Completed	NA	NA		
City of Ocoee	LAP41	Arbors at Crown Point Subdivision	Retention BMPs at Fountain Rd. – West Rd.	Structural BMPs – Load Reductions Not Quantified	Lake Apopka Basin	Completed	NA	NA		
City of Ocoee	LAP42	Crown Pointe Cove Subdivision	Retention BMPs at West Rd. and Ocoee-Apopka Rd.	Structural BMPs – Load Reductions Not Quantified	Lake Apopka Basin	Completed	NA	NA		
City of Ocoee	LAP43	Eagles Creek Subdivision	Retention BMPs at Ocoee-Apopka Rd. and Fullers Cross Rd.	Structural BMPs – Load Reductions Not Quantified	Lake Apopka Basin	Completed	NA	NA		
City of Tavares	Tavares03-DORA	Education and Outreach Activities	Pamphlets, website, illicit connection reporting. City adopted irrigation ordinance and has several displays of FFL.	Education and Outreach Efforts	Lake Dora Basin	Completed	6			
City of Tavares	Tavares03-EUS	Education and Outreach Activities	Pamphlets, website, illicit connection reporting. City adopted irrigation ordinance and has several displays of FFL.	Education and Outreach Efforts	Lake Eustis Basin	Completed	9			
City of Tavares	Tavares03-HAR	Education and Outreach Activities	Pamphlets, website, illicit connection reporting. City adopted irrigation ordinance and has several displays of FFL.	Education and Outreach Efforts	Lake Harris Basin	Completed	8			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
City of Tavares	Tavares04-DORA	City of Tavares Downtown Community Redevelopment Area (CRA) Area A Stormwater Improvements Treatment Pond	Project proposes construction of stormwater interceptor to divert stormwater from city's downtown CRA into new wet detention pond, thus eliminating several direct outfalls into Lake Dora. Water quality benefits to lake include sediment/TP/TN loading reductions. Located in Lake County (Sections: 29,32; Township: 19S; Range: 26E).	Structural BMPs – Quantified Load Reductions	Lake Dora Basin	Underway	104	518		
City of Umatilla	YALE04-TROUT	Trout Lake Priority for Reuse	Trout Lake priority for reuse.	Structural BMPs – Load Reductions Not Quantified	Trout Lake Basin	Cancelled				
City of Umatilla	YALE04-YALE	Lake Yale Priority for Reuse	Lake Yale priority for reuse.	Structural BMPs – Load Reductions Not Quantified	Lake Yale Basin	Cancelled				
City of Wildwood	WILDWD01	Education and Outreach Activities	Education and outreach activities.	Education and Outreach Efforts	Lake Harris Basin	Completed	0.3			
City of Winter Garden	WNTRGAR02-ROB	Education and Outreach Activities	Education outreach credit of 6 %.	Education and Outreach Efforts	Lake Roberts Basin	Completed	2		1	
City of Winter Garden	LAP49	Stormwater Capture and Reuse and Recharge	Treat untreated stormwater with recharge to aquifer. Berm will direct-discharge canals to Lake Apopka and treat stormwater to reuse standards to be put into distribution system. Project also includes aquifer recharge with reclaimed water.	Stormwater Reuse	Lake Apopka Basin	Underway	TBD	TBD		
FDACS	NUTRIENT13	Statewide BMP Manual for Dairy Operations	Development and rule adoption of manual addressing BMPs for fruit and nut production.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
FDACS	NUTRIENT14	Statewide Cow/Calf BMP Manual Development and Implementation	Development and rule adoption of manual addressing BMPs for cows/calves.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				
FDACS	NUTRIENT15	Statewide Equine BMP Manual Development and Implementation	Development and rule adoption of manual addressing BMPs for horse management. Management of agricultural runoff reduces nutrient loadings.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				
FDACS	NUTRIENT16	Statewide Nurseries	Revision and adoption of manual addressing BMPs for container grown plants. Management of agricultural runoff reduces nutrient loadings.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				
FDACS	NUTRIENT17	Statewide Vegetable and Agronomic Crops	Revision and adoption of manual addressing BMPs for vegetable and agronomic crops. Management of agricultural runoff reduces nutrient loadings.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				
FDACS	NUTRIENT18	Statewide Sod Operations BMP Manual	Development and rule adoption of manual addressing BMPs for sod operations.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				
FDACS	NUTRIENT19	Sod Farm Operations	Reduce nutrient loadings from sod farm operations.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				
FDACS	NUTRIENT20	BMP Enrollment	Agricultural acreage covered by BMP NOIs increased by 1,322.87 acres during reporting period.	Agricultural BMPs	Upper Ocklawaha Basin	Completed				
FDOT District 5	DOT01-DORA	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Lake Dora Basin	Completed	32	50		

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
FDOT District 5	DOT01-EUS	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Lake Eustis Basin	Completed	132	206		
FDOT District 5	DOT01-GRIF	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Lake Griffin Basin	Completed	57	88		
FDOT District 5	DOT01-HAR	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Lake Harris Basin	Completed	105	164		
FDOT District 5	DOT01-LAP	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways (US 27, US 441, SR 44, SR 19, SR 50).	Nonstructural BMP – Quantified Load Reductions	Lake Apopka Basin	Completed	53	82		
FDOT District 5	DOT01-PAL	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Palatlakaha River Basin	Completed	37	57		
FDOT District 5	DOT01-TROUT	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Trout Lake Basin	Completed	24	37		
FDOT District 5	DOT01-YALE	FDOT Street Sweeping (E5Q71 Contract No)	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Lake Yale Basin	Completed	8	12		
FDOT District 5	DOT02-CARL	FDOT Swale Maintenance	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Lake Carlton Basin	Completed	<1	3		
FDOT District 5	DOT02-TROUT	FDOT Swale Maintenance	Remove debris and sediment from state-maintained roadways swales.	Nonstructural BMP – Quantified Load Reductions	Trout Lake Basin	Completed	5	39		

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
FDOT District 5	DOT02-YALE	FDOT Swale Maintenance	Remove debris and sediment from state-maintained roadways.	Nonstructural BMP – Quantified Load Reductions	Lake Yale Basin	Completed	4	33		
FDOT District 5	DOT03-CARL	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along state highway system (SHS).	Nonstructural BMP – Quantified Load Reductions	Lake Carlton Basin	Completed	206	206		
FDOT District 5	DOT03-DORA	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along SHS.	Nonstructural BMP – Quantified Load Reductions	Lake Dora Basin	Completed	96	96		
FDOT District 5	DOT03-HAR	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along SHS.	Nonstructural BMP – Quantified Load Reductions	Lake Harris Basin	Completed	819	819		
FDOT District 5	DOT03-LAP	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along SHS (US 27, US 441, SR 44, SR 19, SR 50).	Nonstructural BMP – Quantified Load Reductions	Lake Apopka Basin	Completed	2,607	2,607		
FDOT District 5	DOT03-LLHAR	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along SHS in Little Lake Harris Basin.	Nonstructural BMP – Quantified Load Reductions	Lake Harris Basin	Completed	189	189		
FDOT District 5	DOT03-PAL	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along SHS.	Nonstructural BMP – Quantified Load Reductions	Palatlakaha River Basin	Completed	1,437	1,437		
FDOT District 5	DOT03-TROUT	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along SHS.	Nonstructural BMP – Quantified Load Reductions	Trout Lake Basin	Completed	502	502		
FDOT District 5	DOT03-YALE	Fertilizer Cessation	Eliminate bulk fertilizer contracts. Reduce TN/TP by eliminating fertilizer use along SHS.	Nonstructural BMP – Quantified Load Reductions	Lake Yale Basin	Completed	463	463		
FDOT District 5	DOT04-CARL	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Lake Carlton Basin	Completed	<1			
FDOT District 5	DOT04-DORA	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Lake Dora Basin	Completed	<1			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
FDOT District 5	DOT04-EUS	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Lake Eustis Basin	Completed	<1			
FDOT District 5	DOT04-GRIF	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Lake Griffin Basin	Completed	<1			
FDOT District 5	DOT04-HAR	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Lake Harris Basin	Completed	1			
FDOT District 5	DOT04-PAL	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Palatlakaha River Basin	Completed	<1			
FDOT District 5	DOT04-Trout	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Trout Lake Basin	Completed	<1			
FDOT District 5	DOT04-YALE	Education and Outreach Activities	Informational pamphlets and illicit discharge notification.	Education and Outreach Efforts	Lake Yale Basin	Completed	<1			
Howey-in-the-Hills	HAR27	Baffle Box	NSBB installed in urban area of city bordering Little Lake Harris.	Structural BMPs-Quantifiable Load Reductions	Lake Harris Basin	Completed	11			
Howey-in-the-Hills	HHILL01	Education	Education outreach assigned 1 % credit for meeting MS4 permit requirements.	Education and Outreach Efforts	Lake Harris Basin	Completed	1			
Lake County	DORA43	Lake Saunders Outfall Improvements	Project addressed deteriorating pipe, ditch, and outfall from Lake Saunders to Lake Dora. Pipe upsizing reduced flood stage in Lake Saunders. Ditch improvements included raised/ditch block area to provide treatment. Project also included drainage improvements for commercial area adjacent to Bay Rd. that previously had no treatment and caused drainage complaints.	Structural BMPs – Load Reductions Not Quantified	Lake Dora Basin	Completed				

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Lake County	HAR21	Magnolia Lane Water Quality Retrofit	Install pipe, manholes and next-generation baffle box with media filtration on existing outfall in portion of Springs Subdivision in Yahala. Will retrofit treatment onto 18-acre basin.	Structural BMPs – Quantified Load Reductions	Lake Harris Basin	Underway	3	25		
Lake County	HAR22	Harris Rd. Water Quality Retrofit	Install swales with ditch blocks and replace existing outfall with next-generation nutrient removal baffle box at Harris Rd. and County Road (CR) 473 in Tavares.	Structural BMPs – Load Reductions Not Quantified	Lake Harris Basin	Planned				
Lake County	HAR23	Country Club Dr. Water Quality Retrofit	Install multiple NSBB-type structures on existing direct stormwater discharges from Country Club Dr. (Astatula) to Little Lake Harris.	Structural BMPs – Load Reductions Not Quantified	Lake Harris Basin	Planned				
Lake County	HAR24	Aquatic Vegetation Harvesting – Dead River and Hollondel Ponds	Chemical treatment with physical harvesting and removal of excessive aquatic plants in Dead River and Hollondel Ponds. 150+ cubic yards of plant material harvested and removed from ponds. Nutrient load in plant matter physically removed from system.	Nonstructural BMP – Load Reductions Not Quantified	Lake Harris Basin	Completed				
Lake County	LC05-DEN	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Denham Basin	Completed	4		2	
Lake County	LC05-DORA	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Dora Basin	Completed	40.8			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Lake County	LC05-EUS	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Eustis Basin	Completed	92.9			
Lake County	LC05-GRIF	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Griffin Basin	Completed	61.9			
Lake County	LC05-HAR	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Harris Basin	Completed	67.7			
Lake County	LC05-LAP	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Apopka Basin	Completed				
Lake County	LC05-PAL	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Palatlakaha River Basin	Completed	39.3			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Lake County	LC05-TROUT	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Trout Lake Basin	Completed	4.3			
Lake County	LC05-YALE	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Yale Basin	Completed	19.6			
Lake County	LC05-CARL	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Carlton Basin	Completed	0.7			
Lake County	LC05-BCL	Support of Adopt-a-Lake Program	Adopt-a-Lake Program is outreach program to Lake County residents that enhances knowledge and awareness of stormwater management. Part of MS4 Phase II public education requirement (replaces WAV Program).	Education and Outreach Efforts	Lake Beauclair Basin	Completed	10.3			
Lake County	LC07	Targeted Business Sector BMP Education	Site visits to targeted business sectors (automotive service, landscape, and food service) throughout unincorporated Lake County. Inspection for BMPs to protect stormwater quality and distribution of educational flyers on water quality.	Education and Outreach Efforts	Upper Ocklawaha Basin	Completed				

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Lake County	LC08	Construction Erosion Control – Education and Inspection	Provide DEP Erosion Control Inspector Training and Certification exam to private construction and local government employees through qualified county staffer for free annually. Conduct ongoing site inspections for use of erosion control BMPs at all construction sites throughout unincorporated Lake County. Educate contractors and municipal employees on construction erosion control measures.	Education and Outreach Efforts	Upper Ocklawaha Basin	Completed				
Lake County	LC09-CARL	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Lake Carlton Basin	Completed	3	6		
Lake County	LC09-DORA	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Lake Dora Basin	Completed	57	93		
Lake County	LC09-EUS	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Lake Eustis Basin	Completed	3	6		
Lake County	LC09-GRIF	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Lake Griffin Basin	Completed	9	14		

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Lake County	LC09-HAR	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Lake Harris Basin	Completed	5	9		
Lake County	LC09-LAP	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Lake Apopka Basin	Completed	0	1		
Lake County	LC09-PAL	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Palatlakaha River Basin	Completed	8	13		
Lake County	LC09-YALE	Catch Basin and Pipe Cleaning	Lake County proactively cleans stormwater manholes and pipes to remove accumulated sediments and nutrients to reduce discharge to receiving waterbodies. Project aids in reduction of sediment and TSS and nutrient loading to waterbodies countywide.	Nonstructural BMPs – Load Reductions Not Quantified	Lake Yale Basin	Completed	3	6		
Lake County	PAL30	Lake Emma Rd. and Lake Emma Estates Water Quality Retrofit	Install 3 next-generation nutrient baffle boxes on existing outfalls from Lake Emma Rd. and Lake Emma Estates Subdivision.	Structural BMPs – Quantified Load Reductions	Palatlakaha River Basin	Underway	4	37		
LCWA	DEN01	Lake Denham Muck Farm Buyout	Purchase 563-acre Lake Denham Muck Farm to eliminate 1,100 lbs/yr TP loading.	Restoration and Water Quality Improvement Project	Lake Denham Basin	Underway	1,100		563	

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
LCWA	PAL23	Hooks St. Interlocal Water Quality Improvement (WQI) Project	Hooks St. in Clermont.	Structural BMPs – Load Reductions Not Quantified	Palatlakaha River Basin	Cancelled				
LCWA	TROUT09	Water Quality Investigation	Trout Lake Watershed: Survey and identify potential nutrient sources not previously evaluated and propose remediation projects.	Special Studies and Planning Efforts	Trout Lake Basin	Completed				
LCWA	YALE05	Water Quality Investigation	Lake Yale Watershed: Survey and identify potential nutrient sources not previously evaluated and propose remediation projects.	Special Studies and Planning Efforts	Lake Yale Basin	Completed				
Marion County	MARION01-YALE	Springshed Protection	Prevent further degradation of water quality of Rainbow and Silver Springs and reduce or eliminate existing sources of pollution. Marion County Board of County Commissioners adopted Resolution 05-R-106 declaring support for protection of Marion County springs and directing staff to develop recommended policies for springs protection. Fertilizer Ordinance 08-35 was adopted on November 4, 2008. Irrigation Ordinance 08-09 was adopted on April 1, 2008, and subsequently amended in Ordinance 09-13 on May 19, 2009. Springs Protection Ordinance 09-17 was adopted June2, 2009, and included multiple amendments to county land development code, adoption of spring protection overlay zone, regulations for springs protection and water conservation, etc.	Education and Outreach Efforts	Lake Yale Basin	Completed	1			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Marion County	MARION01-GRIF	Springshed Protection	Prevent further degradation of water quality of Rainbow and Silver Springs and reduce or eliminate existing sources of pollution. Marion County Board of County Commissioners adopted Resolution 05-R-106 declaring support for protection of Marion County springs and directing staff to develop recommended policies for springs protection. Fertilizer Ordinance 08-35 was adopted on November 4, 2008. Irrigation Ordinance 08-09 was adopted on April 1, 2008, and subsequently amended in Ordinance 09-13 on May 19, 2009. Springs Protection Ordinance 09-17 was adopted June2, 2009, and included multiple amendments to county land development code, adoption of spring protection overlay zone, regulations for springs protection and water conservation, etc.	Education and Outreach Efforts	Lake Griffin Basin	Completed	40			
Marion County	MARION06	Street Sweeping	Curbed section of Highway 42 in Lake Griffin Basin. Sweep county-maintained curbed section of Highway 42. Swept 9 times per year.	Structural BMPs – Load Reductions Quantified	Lake Griffin Basin	Completed	1			
Orange County	CARL01	Lake Carlton Nutrient and Hydrologic Assessment	Lake Carlton Watershed. Nutrient and hydrologic assessment of lake and identification of possible nutrient reduction projects.	Special Studies and Planning Efforts	Lake Carlton Basin	Underway				
Orange County	LAP38	Lake Clarice Pond	Lake Clarice Estates. Bold and Gold® filter media added to discharge of wet pond.	Structural BMPs – Load Reductions Not Quantified	Lake Apopka Basin	Planned	TBD			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Orange County	LAP44	Lake Black Hydrological and Nutrient Pollutant Source Assessment	Stakeholders can use data and information from assessment to refine TMDL, provide allocation information in watershed, and identify potential BMP effectiveness.	Special Studies and Planning Efforts	Lake Apopka Basin	Underway				
Orange County	LAP45	Lake Roper Hydrological and Nutrient Pollutant Source Assessment	Stakeholders can use data and information from assessment to refine TMDL, provide allocation information in watershed, and identify potential BMP effectiveness.	Special Studies and Planning Efforts	Lake Apopka Basin	Underway				
Orange County	LAP46	Lake Tilden Hydrological and Nutrient Pollutant Source Assessment	Stakeholders can use data and information from assessment to refine TMDL, provide allocation information in watershed, and identify potential BMP effectiveness.	Special Studies and Planning Efforts	Lake Apopka Basin	Underway				
Orange County	ORANGE09-MARSHAL	Educational Efforts	Implementation of educational efforts per new DEP guidelines: (1) FYN funded by county, (2) local ordinances existing or under development; landscape ordinance under revision to reflect FYN; fertilizer ordinance under development to require certifications and reduced TP content; water conservation ordinance limiting landscape irrigation; (3) PSAs including pet waste; (4) information pamphlets addressing pollution reduction and good housekeeping from NPDES Program; (5) Water Atlas and website addressing nutrient reduction; (6) and proactive and reactive inspection programs associated with NPDES and complaint system for call-in by residents.	Education and Outreach Efforts	Lake Marshall Basin	Completed	2		1	

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Orange County	ORANGE09-ROB	Educational Efforts	Implementation of educational efforts per new DEP guidelines: (1) FYN funded by county, (2) local ordinances existing or under development; landscape ordinance under revision to reflect FYN; fertilizer ordinance under development to require certifications and reduced TP content; water conservation ordinance limiting landscape irrigation; (3) PSAs including pet waste; (4) information pamphlets addressing pollution reduction and good housekeeping from NPDES Program; (5) Water Atlas and website addressing nutrient reduction; and (6) proactive and reactive inspection programs associated with NPDES and complaint system for call-in by residents.	Education and Outreach Efforts	Lake Roberts Basin	Completed	2		1	
Orange County	ORANGE09-BCL	Educational Efforts	Implementation of educational efforts per new DEP guidelines: (1) FYN funded by county, (2) local ordinances existing or under development; landscape ordinance under revision to reflect FYN; fertilizer ordinance under development to require certifications and reduced TP content; water conservation ordinance limiting landscape irrigation; (3) PSAs including pet waste; (4) Information pamphlets addressing pollution reduction and good housekeeping from NPDES Program; (5) Water Atlas and website addressing nutrient reduction; and (6) proactive and reactive inspection programs associated with NPDES and complaint system for call-in by residents.	Education and Outreach Efforts	Lake Beauclair Basin	Completed	3			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Orange County	ORANGE09-LAP	Educational Efforts	Implementation of educational efforts per new DEP guidelines: (1) FYN funded by county, (2) local ordinances existing or under development; landscape ordinance under revision to reflect FYN; fertilizer ordinance under development to require certifications and reduced TP content; water conservation ordinance limiting landscape irrigation; (3) PSAs including pet waste; (4) information pamphlets addressing pollution reduction and good housekeeping from NPDES Program; (5) Water Atlas and website addressing nutrient reduction; and (6) proactive and reactive inspection programs associated with NPDES and complaint system for call-in by residents.	Education and Outreach Efforts	Lake Apopka Basin	Completed				
Orange County	ORANGE09-CARL	Educational Efforts	Implementation of educational efforts per new DEP guidelines: (1) FYN funded by county, (2) local ordinances existing or under development; landscape ordinance under revision to reflect FYN; fertilizer ordinance under development to require certifications and reduced TP content; water conservation ordinance limiting landscape irrigation; (3) PSAs including pet waste; (4) information pamphlets addressing pollution reduction and good housekeeping from NPDES Program; (5) Water Atlas and website addressing nutrient reduction; and (6) proactive and reactive inspection programs associated with NPDES and complaint system for call-in by residents.	Education and Outreach Efforts	Lake Carlton Basin	Completed	5.6			

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
Orange County	ORANGE09-DORA	Educational Efforts	Implementation of educational efforts per new DEP guidelines: (1) FYN funded by county, (2) local ordinances existing or under development; landscape ordinance under revision to reflect FYN; fertilizer ordinance under development to require certifications and reduced TP content; water conservation ordinance limiting landscape irrigation; (3) PSAs including pet waste; (4) information pamphlets addressing pollution reduction and good housekeeping from NPDES Program; (5) Water Atlas and website addressing nutrient reduction; and (6) proactive and reactive inspection programs associated with NPDES and complaint system for call-in by residents.	Education and Outreach Efforts	Lake Dora Basin	Completed	0.9			
Orange County	ROB01	Lake Roberts Sediment Inactivation	Alum injection. Sediment inactivation on entire lake surface.	Structural BMPs – Quantified Load Reductions	Lake Roberts Basin	Planned	TBD		TBD	
Orange County	ROB02	Lake Roberts Nutrient and Hydrologic Loading Study	Lake Roberts nutrient and hydrologic loading study.	Special Studies and Planning Efforts	Lake Roberts Basin	Completed				
Orange County	ROB03	Lake Roberts Feasibility Study	BMP construction feasibility study.	Special Studies and Planning Efforts	Lake Roberts Basin	Completed				
SJRWMD	LAP50	In-Lake Sump Project at Lake Apopka	SJRWMD Contract 27971. Dredging in Lake Apopka in northwest portion of lake to remove nutrient-laden sediments and create sump where unconsolidated flocculent can settle and be removed in future. Project also includes navigation dredging near mouth of Apopka-Beauclair Canal. Project will remove 28,400 lbs/TN and 662,00 lbs/TP.	Muck Removal/ Restoration Dredging	Lake Apopka	Underway				

Lead Entity	Project Number	Project Name	Project Description	Project Type	Location	Project Status	TP Reduction (lbs/yr)	TN Reduction (lbs/yr)	TP Reduction (kg/yr)	TN Reduction (kg/yr)
SJRWMD	LAP51	Unconsolidated Floc Pumping	Pump unconsolidated floc from Lake Apopka to improve opportunity for habitat. Project will remove 16,000 lbs/TN and 500 lbs/TP.	Muck Removal/ Restoration Dredging	Lake Apopka	Underway				
SJRWMD	LAP52	Lake Apopka Submerged Aquatic Vegetation (SAV) Initial Assessment and In-Lake Planting Pilot Projects	SJRWMD Contract 31945 with University of Florida (UF). Purpose: Reestablish viable beds of SAV, document viability and growth, and assess environmental conditions that promote or limit establishment, persistence, and expansion of planted SAV. This will inform future large-scale efforts to restore SAV. Greater than 5 acres of planted SAV.	SAV Planting	Lake Apopka	Underway				
SJRWMD	LAP53	Stormwater Nutrient Loading Assessment of Lake Apopka Tributaries	SJRWMD Contract 31869. Storm event monitoring of tributaries on Lake Apopka south shore; includes project concept development for phosphorus load reductions. Implementation of projects will be via future cost-share or Florida Legislature appropriations.	Special Studies and Planning Efforts	Lake Apopka Basin	Underway				
East Central Florida Expressway Authority		Stormwater Treatment for SR451	Ponds 1, 3, 4, and 5 are dry detention ponds designed to retain 25-year, 24-hour storm event. Pond 9 is wet detention pond designed to retain entire 100-year, 24-hour storm event.	Structural BMPs	Lake Marshall Basin	Completed			1.5	

Appendix D. References

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