STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

In re:
AMENDMENTS TO THE ORANGE CREEK BASIN MANAGEMENT ACTION PLAN
_____/

OGC Case No. 19-0436

FINAL ORDER AMENDING THE ORANGE CREEK BASIN MANAGEMENT ACTION PLAN

Pursuant to Section 403.067(7), Florida Statutes, this Final Order adopts amendments to the 2008 Orange Creek Basin Management Action Plan ("BMAP"), as that BMAP was updated and supplemented in 2014. These amendments, entitled "Orange Creek Basin Management Action Plan Amendments" and dated June 2019, are attached hereto and incorporated herein as Exhibit 1. The 2008 Orange Creek BMAP, as supplemented in 2014, remains in full force and effect, except as modified by the amendments in Exhibit 1.

The Orange Creek 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 Orange Creek 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 Orange Creek Basin is located mostly in Alachua County. It also encompasses the north portion of Marion County and the southwestern part of Putnam County. In 2003, and 2006 for Alachua Sink, the Department established TMDLs for waters within the Orange Creek Basin in Rule 62-304.500 F.A.C. Excessive nutrients are the primary pollutants contributing to the impairments. Table 1 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 Orange Creek 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 November 28, 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 D 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 Orange Creek Basin Management Action Plan Amendment.

NOTICE OF RIGHTS

The Orange Creek 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. Ethridge 7/23/19
Deputy CLERK DATE

Orange Creek
Basin Management Action Plan
Amendment

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

with participation from the
Orange Creek Basin Stakeholders

June 2019

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

Acknowledgments

This *Orange Creek 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 (DEP) in coordination with the Orange Creek Basin Working Group (BWG) participants and stakeholders:

Orange Creek BWG participants and stakeholders

Type of Organization/Entity	Name
Local Governments	Alachua County Marion County Gainesville Hawthorne Gainesville Regional Utilities McIntosh Micanopy Waldo
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 2 Florida Department of Transportation, District 5 Florida Department of Environmental Protection–Northeast District Florida Department of Environmental Protection–Tallahassee Florida Department of Health in Alachua County University of Florida
Other Interested Stakeholders	Agriculture Florida Forestry Association Rayonier Inc. Weyerhaeuser Company Suwannee-St. Johns Group Sierra Club Applied Technology and Management Environmental Consulting and Technology DB Environmental Pegasus Engineering AMEC Foster Wheeler Jones Edmunds Unaffiliated Citizens

For additional information on the watershed management approach in the Orange Creek Basin, contact:

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List of Acronyms and Abbreviations

ACEPD	Alachua County Environmental Protection Department
ACHD	Alachua County Health Department
ACPCL	Alachua County Parks and Conservation Lands
ACPWD	Alachua County Public Works Department
ACT	Alachua Conservation Trust
BMAP	Basin Management Action Plan
BMP	Best Management Practice
BWG	Basin Working Group
CCRS	Camps Canal and River Styx
DEP	Florida Department of Environmental Protection
DO	Dissolved Oxygen
EMC	Event Mean Concentration
EPA	U.S. Environmental Protection Agency
FCT	Florida Communities Trust
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FFL	Florida Friendly Landscaping
FFLP	Federal Forest Legacy Program
FLUCCS	Florida Land Use, Cover, and Forms Classification System
FRPP	Farm and Ranch Land Protection Program
F.S.	Florida Statutes
FSA	Florida Stormwater Association
FWC	Florida Fish and Wildlife Conservation Commission
FWRA	Florida Watershed Restoration Act
FWS	U.S. Fish and Wildlife Service
FYN	Florida Yards and Neighborhoods
GIS	Geographic Information System
GRU	Gainesville Regional Utilities
HSPF	Hydrological Simulation Program - FORTRAN
HUD	Housing and Urban Development
IDDE	Illicit Discharge Detection and Elimination
lbs-TP/yr	Pounds of Total Phosphorus Per Year
lbs-TN/yr	Pounds of Total Nitrogen Per Year
lbs/yr	Pounds Per Year
LID	Low-Impact Development
mg/L	Milligrams Per Liter
MS4	Municipal Separate Storm Sewer System
NA	Not Applicable
N/A	Not Available
NLII	Newnans Lake Improvement Initiative
NNC	Numeric Nutrient Criteria

NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
OAWP	Office of Agricultural Water Policy
OFW	Outstanding Florida Water
OSTDS	Onsite Sewage Treatment and Disposal System
PSA	Public Service Announcement
SAV	Submerged Aquatic Vegetation
SCI	Stream Condition Index
SJRWMD	St. Johns River Water Management District
SR	State Road
SW	Stormwater
TBD	To Be Determined
TIGER	Topologically Integrated Geographic Encoding and Referencing
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
TSI	Trophic State Index
UF	University of Florida
UF–IFAS	University of Florida Institute of Food and Agricultural Sciences
ULDC	Unified Land Development Code
USDA	U.S. Department of Agriculture
WBID	Waterbody Identification (Number)
WMM	Watershed Management Model
WRF	Water Reclamation Facility
WWTP	Wastewater Treatment Plant

Executive Summary

The Phase 2 Orange Creek Basin Management Action Plan (BMAP) was adopted in 2014. That plan identified Lake Wauberg, Orange Lake, and Newnans Lake (**Figure ES-1**) as waterbodies in the basin that would not meet their total maximum daily loads (TMDLs) because they did not have adequate management strategies to reduce nutrient loading to TMDL targets. The stated goal of the 2014 BMAP was the identification of additional management strategies for these waterbodies.

This Amendment presents the allocations or assignment of loading reductions and project credits for the combined loading from developed urban land uses and septic systems (within 200 meters of waterbodies) for Orange Lake and Newnans Lake, assigns credits for agricultural activities that reduce pollutant loading, and updates project and nutrient budget status for Lake Wauberg and Alachua Sink. Lake Wauberg and Alachua Sink did not receive allocations of loading reductions for the reasons listed in **Chapter 1**. Agricultural operations in the Orange Creek Basin are required to implement appropriate best management practices (BMPs) with assistance from the Florida Department of Agriculture and Consumer Services (FDACS) through a Notice of Intent (NOI).

This document also introduces and allocates reductions and assigns project credits for the Lochloosa Lake and Cross Creek TMDLs adopted in 2017 for total phosphorus (TP) and total nitrogen (TN). Lochloosa Lake is a tributary input of Orange Lake through Cross Creek.

TMDLs were developed for both TN and TP for Newnans Lake, Lake Wauberg, and Lochloosa Lake, but only for TP for Orange Lake and only for TN for Alachua Sink. The Orange Creek Basin has unique geological characteristic, with the phosphate-rich clays and sediments of the Hawthorn Group present in tributary watersheds and in contact with the bottom of Newnans Lake and Lake Wauberg. The presence of these phosphate-rich clays requires management attention to focus on reducing their movement from the watershed into the lakes. The contact of the Hawthorn Group with lake bottoms complicates phosphorus control and remediation.

Management strategies are presented for Orange, Lochloosa, and Newnans Lakes, as well as Lake Wauberg and Alachua Sink, that attain reductions in loading for these lakes. The initial focus is on identifying and removing watershed or external loading sources from the lakes. TMDLs calculated for Newnans Lake and Lochloosa Lake identified substantial internal loading of nutrients to those lakes as a source of their water quality impairment. However, internal loading will not be immediately addressed until management actions are in place to reduce loading from the watershed.

This document sets a target date of 2028, 20 years after the initial adoption of the BMAP, for identifying management actions and, to the extent possible, achieving loading reductions for these waterbodies. Projects are updated annually, allowing progress toward meeting the 2028 target date and timelines for meeting water quality goals to be evaluated and adjusted as needed.

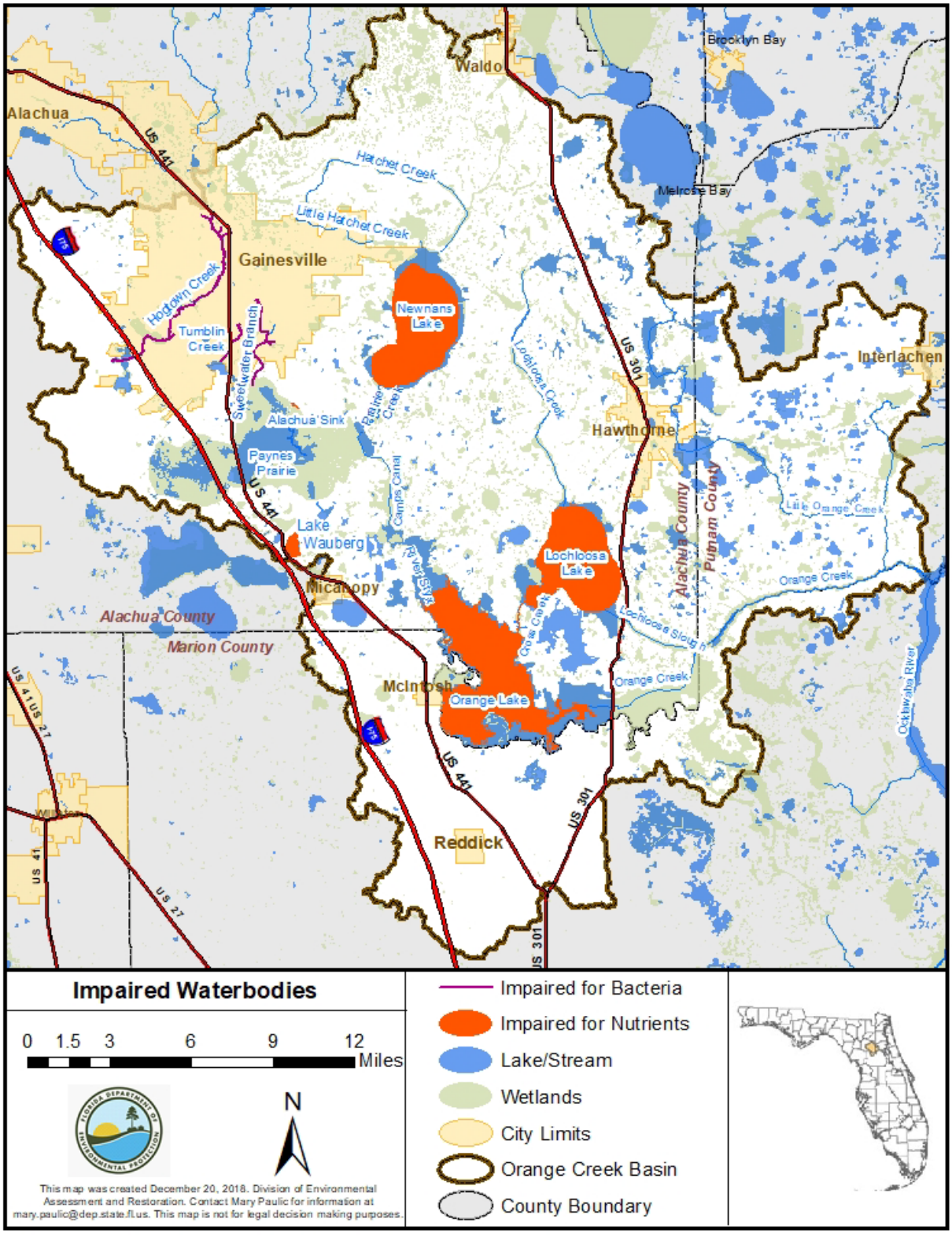

Figure ES-1. Location of impaired waterbodies

The 2008 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.

Nutrient Source Budgets

Watershed loadings were based on TMDL estimates using 1995 land use data and the number of septic systems present within 200 meters of the waterbody shoreline, tributaries, or other connected drainage pathways discharging to the waterbody. Land use was not updated because loadings calculated from 2009 land use and rainfall information were in the same range as loadings calculated from 1995 land use and corresponding rainfall information. Information on the location of septic systems was obtained from 2016 Florida Water Management Inventory Project survey data collected by the Florida Department of Health (FDOH).

Table ES-1 summarizes the revised TP and TN loading numbers for Newnans, Orange, and Lochloosa Lakes that were used to develop allocations. Stormwater and septic system project credits and agricultural BMP credits are not included in the loading estimates. **Appendix B** contains the detailed nutrient budgets.

Loading from forest land was not included as part of the baseline loading used for allocation, and other source loadings were not adjusted to compensate for the removal of forest loading. A large part of the forest land in the basin is managed for the commercial harvest of pine trees, but no distinction was made in loading during TMDL development between these commercial lands and other forest types. Commercial pine forest management is required to follow forestry BMPs and basin-specific management recommendations described in **Chapter 3, Nutrient Budget Adjustments**.

Table ES-2 summarizes the updated TP and TN budgets for Lake Wauberg and Alachua Sink. Credits for agricultural BMPs through July 31, 2018, and stormwater projects through December 2018 are included. **Appendix B** contains detailed nutrient budgets, including credits for projects.

Table ES-1. TP and TN source loading (pounds of TP or TN per year [lbs-TP/yr or lbs-TN/yr]) summary for Newnans Lake, Orange Lake, and Lochloosa Lake

Notes: Stormwater project credits, agricultural BMP credits, and septic system credits were not included.
[1] Baseline loading without forest loading and point source loading were used to calculate required reductions.

Sources	Newnans Lake Estimated TP Load	Newnans Lake Estimated TN Load	Lochloosa Lake Estimated TP Load	Lochloosa Lake Estimated TN Load	Orange Lake Estimated TP Load
Atmospheric Deposition	3,223	6,446	4,248	72,825	2,941
Point Source	386	3,104			
Forest Stormwater Runoff	1,767	28,243	1,698	24,325	594
Undeveloped Land Uses Stormwater Runoff	3,371	31,850	1,203	16,669	3,363
Agricultural Stormwater Runoff	522	3,580	2,510	22,403	5,986
Developed Land Uses Stormwater Runoff	1,246	11,128	1,667	13,266	945
Seepage/Groundwater	1,827	6,698			
Septic Systems Total	256	1,870			390
Internal Loading	13,478	226,527	5,426	266,655	
Tributary Inflow					13,671
Camps Canal (Newnans Lake)					10,344
Cross Creek (Lochloosa Lake**)**					3,327
Loading Information					
Total Baseline Loading	**26,076**	**319,869**	**16,752**	**416,142**	**27,890**
Baseline Loading without Forest Loading and Point Source[1]	**23,923**	**288,523**	**15,054**	**391,817**	**27,296**
TMDL	**10,924**	**85,470**	**9,932**	**172,318**	**15,262**
Required Loading Reduction to Meet TMDL	**12,999**	**203,053**	**5,122**	**219,499**	**12,034**

Table ES-2. Net loading summary for Lake Wauberg and Alachua Sink

Notes: Stormwater loading for Lake Wauberg did not distinguish between natural and developed lands.
Agricultural BMP credits through July 31, 2018, and stormwater project credits through December 2018 were applied.
[1] Developed land use including agriculture and undeveloped land use loadings were not separated.
[2] Point source loading and developed land use loading were combined.
[3] Prairie Creek loading was adjusted for Newnans Lake projects as 45 % of Newnans Lake credits.
[4]Agricultural BMP reductions were subtracted from agricultural runoff and stormwater BMP reductions were subtracted from total stormwater runoff for developed land uses.

Sources	Lake Wauberg Net Estimated Load TP (lbs-TP/yr)	Lake Wauberg Net Estimated Load TN (lbs-TN/yr)	Alachua Sink Net Estimated TN Load (lbs-TN/yr)
Atmospheric Deposition	NA	NA	23
Point Sources	NA	NA	NA[2]
Stormwater Runoff Undeveloped Land Use	NA[1]	NA[1]	72,252
Agricultural Runoff[4]	NA[1]	NA[1]	11,071
Agricultural BMPs	NA[1]	NA[1]	-363
Stormwater Runoff Developed Land Use[4]	469[1]	2,566[1]	28,861[2]
Stormwater BMPs	-39	-199	-138,190
Septic Systems	240	1,299	4,667
Prairie Creek	NA	NA	210,444[3]
Newnans Lake Projects			-2,304
Loading Information			
Net Loading	**709**	**3,865**	**322,084**
TMDLs	**374**	**2,062**	**256,322**
Additional Reduction Needed	**335**	**1,803**	**65,762**

Progress Towards Meeting Loading Reductions

Allocations of loading reductions were assigned to local jurisdictions for Newnans, Orange, and Lochloosa Lakes. 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-3** through **ES-5**. Future adjustments may need to be made to a jurisdiction's overall proportional reduction because of increased land area from the annexation of land into the jurisdiction. Any required adjustments or revisions can be addressed during the annual BMAP reporting process or later during the five-year review.

For all waterbodies, implementation activities to reduce nutrient loadings and achieve the TMDLs have a target date of 2028 listed in each table for identifying management actions and, to the extent possible, achieving loading reductions. 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 target period, with specific targets for each 5-year period. The loading reduction assigned to septic systems is part of the overall developed land loading reductions with a target date of 2028, though that reduction does not have to be specifically targeted to septic systems. The entire reduction may be achieved by addressing stormwater loading from urban and agricultural areas. Local regulations may provide a mechanism or incentive to upgrade conventional septic systems to remove nutrients or convert from septic systems to central sewer. For example, the City of Gainesville Code of Ordinances requires the implementation of applicable sections of FDOH Chapter 64E-6, Florida Administrative Code (F.A.C.). The Florida Springs and Aquifer Protection Act may be a second mechanism for addressing septic systems located in the contributing areas of Outstanding Florida Springs through the implementation of the requirements for BMAPs focused on those spring systems.

Project credits are cumulative since the adoption of the BMAP in 2008. **Appendix D** 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 maintained for the entire period of reduction activity. Credits are based on DEP's crediting scheme outlined in **Chapter 4, Determining Education Credits**. If additional educational activities are undertaken or changes made to DEP's crediting scheme that increase credits, then the additional credits will be added to the second 5-year period. Education credits calculated as less than 0.5 pounds TP per year (lbs-TP/yr) are represented in the watershed summary tables as 0.

Table ES-3a. Newnans Lake required TP 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. Septic systems are considered a developed land use. The total reduction is the sum of developed land use and septic system. How a reduction is achieved is not specific to land use.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	465	233	33	42	**158**	232	**198**	**588**
FDOT, District 2	93	47	4	525	**-483**	46	**0**	**0**
Gainesville	461	231	33	259	**49**	230	**16**	**185**
Waldo	27	14	1	0	**13**	13	**0**	**26**
Total	**1,046**	**525**	**71**	**826**		**521**	**214**	**799**

Table ES-3b. Newnans Lake required TN reductions and credits (lbs-TN/yr) by jurisdiction

*If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0. Septic systems are considered a developed land use. The total reduction is the sum of developed land use and septic system. How a reduction is achieved is not specific to land use.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	4,155	2,078	299	65	**1,714**	2,077	**1,448**	**5,239**
FDOT, District 2	878	439	42	3,414	**-3,017**	439	**0**	**0**
Gainesville	4,094	2,047	294	1,034	**719**	2,047	**113**	**2,879**
Waldo	239	120	10	0	**110**	119	**0**	**229**
Total	**9,366**	**4,684**	**645**	**4,513**		**4,682**	**1,561**	**8,347**

Table ES-4. Orange Lake required TP 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. Septic systems are considered a developed land use. The total reduction is the sum of developed land use and septic system. How a reduction is achieved is not specific to land use.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	38	19	4	0	**15**	19	60	94
FDOT, District 2	15	8	1	54	**-47**	7	0	0
FDOT, District 5	99	50	1	2,934	**-2,885**	49	0	0
Marion County	319	160	31	0	**129**	159	120	408
McIntosh	28	14	1	0	**13**	14	43	70
Micanopy	31	16	2	0	**14**	15	0	29
Reddick	12	6	1	0	**5**	6	0	11
Total	**542**	**273**	**41**	**2,988**		**269**	**223**	**612**

Table ES-5a. Lochloosa Lake required TP 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. Septic systems were included as part of the loading from basin runoff and not explicitly modeled.

Jurisdiction	Total Required Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	411	206	46		**160**	205	**365**
FDOT, District 2	321	161	20	802	**-661**	160	**0**
Hawthorne	156	78	12		**66**	78	**144**
Total	**888**	**445**	**78**	**802**		**443**	**509**

Table ES-5b. Lochloosa Lake required TN reductions and credits (lbs-TN/yr) by jurisdiction

* If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0. Septic systems were included as part of the loading from basin runoff and not explicitly modeled.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	4,055	2,028	335		**1,693**	2,027	**3,720**
FDOT, District 2	3,674	1,837	202	4,759	**-3,125**	1,837	**0**
Hawthorne	1,902	951	105		**846**	951	**1,797**
Total	**9,631**	**4,816**	**642**	**4,759**		**4,815**	**5,517**

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

Scope, Purpose, and Priority Waters

The Phase 2 Orange Creek Basin Management Action Plan (BMAP) was adopted in 2014.[1] That plan identified Lake Wauberg, Orange Lake, and Newnans Lake as waterbodies (**Figure 1**) in the basin that would not meet their total maximum daily loads (TMDLs) because they did not have adequate management strategies to reduce nutrient loading to TMDL targets. The stated goal of the 2014 BMAP was the identification of additional management strategies for these waterbodies.

This Amendment presents the allocations or assignment of loading reductions and project credits to local jurisdictions and Florida Department of Transportation (FDOT) for the combined loading from developed land uses and septic systems (within 200 meters of waterbodies) for Orange Lake and Newnans Lake, assigns credits for agricultural activities that reduce pollutant loading, and updates nutrient budgets and implementation status for Lake Wauberg and Alachua Sink. **Figure 2** displays the steps taken to prepare nutrient budgets and allocations.

The Amendment also introduces and allocates reductions and assigns project credits to local jurisdictions and FDOT for the Lochloosa Lake TMDLs adopted in 2017 for total phosphorus (TP) and total nitrogen (TN). The document suggests management actions that will improve water quality and meet additional TMDLs. Agricultural operations in the Orange Creek Basin are required to implement appropriate best management practices (BMPs) with assistance from the Florida Department of Agriculture and Consumer Services (FDACS) by a Notice of Intent (NOI).

Lake Wauberg and Alachua Sink did not receive allocations of loading reductions. Most of the land in the Lake Wauberg Watershed is in state ownership. A large multi-stakeholder project completed for Alachua Sink addresses the TMDLs' wasteload allocation, and some of the loading into Alachua Sink is derived from Newnans Lake discharge.

This document sets a target date of 2028, 20 years after the initial adoption of the BMAP, for identifying management actions and, to the extent possible, achieving loading reductions for all listed waterbodies. Projects are updated annually, allowing progress toward meeting the 2028 target and timelines for meeting water quality goals to be evaluated and adjusted as needed. The reductions for developed land uses are split into two 5-year periods, each with a specified reduction target. Septic system reductions, where applicable, are part of the total developed land loading reduction that has a 2028 target date.

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

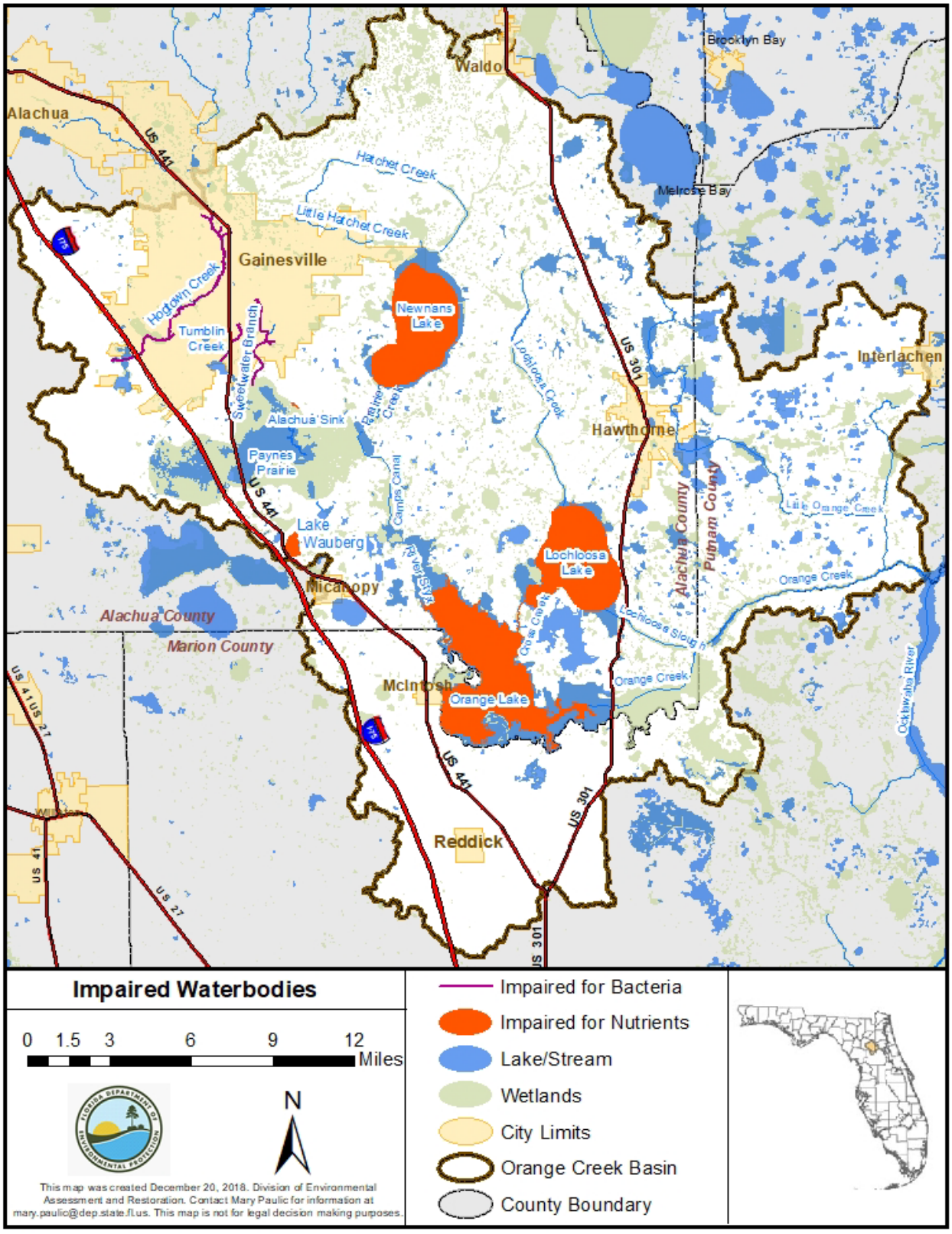

Figure 1. Location of impaired waterbodies

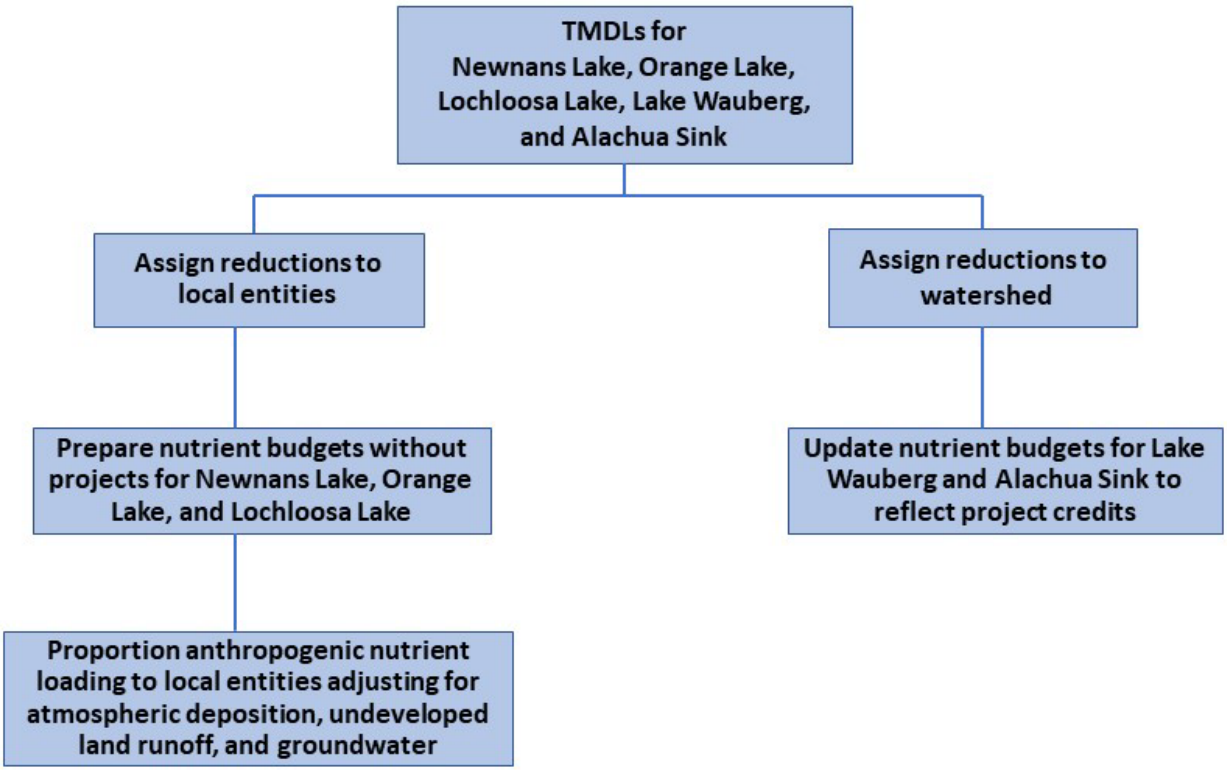

Figure 2. Steps in preparing nutrient budgets and allocations

The 2008 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.

Background

The TMDLs for Lake Wauberg, Orange Lake, and Newnans Lake were adopted in 2003 based on loading estimates derived from 1995 land use, and the Alachua Sink TMDL was adopted in 2006. The Lochloosa Lake TMDL was adopted in 2017 with nutrient loading derived from 2009 land use data and included the watershed attenuation of loadings. **Table 1** lists these TMDLs and required reductions along with target TN and TP concentrations as appropriate.

TMDLs were developed for both TN and TP for Newnans Lake, Lake Wauberg, and Lochloosa Lake, but only for TP for Orange Lake and only for TN for Alachua Sink to reduce loading into the Floridan aquifer. The Orange Creek Basin has unique geological characteristics, with the phosphate-rich clays and sediments of the Hawthorn Group present in tributary watersheds and

in contact with the bottom of Newnans Lake and Lake Wauberg. The presence of these phosphate-rich clays requires management attention to focus on reducing their movement from the watershed into the lakes. The contact of the Hawthorn Group with lake bottoms complicates phosphorus control and remediation.

The TMDLs calculated for Newnans Lake and Lochloosa Lake identified substantial internal loading of nutrients to those lakes as a source of their water quality impairment. However, internal loading will not be immediately addressed until management actions are in place to reduce loading from the watershed.

Pollutant Reduction Allocations

Allocations of TP and TN loading reductions for the combined loading from developed land uses and septic systems were calculated for Alachua County, Marion County, Gainesville, Hawthorne, Waldo, Micanopy, McIntosh, Reddick, and FDOT District 2 and District 5. In general, loading reductions for areas outside city and town boundaries and state roadways were assigned to the county where they were located. The loading reduction allocated to agricultural lands is addressed through enrollment in and implementation of BMPs, a program administered by the Florida Department of Agriculture and Consumer Services (FDACS) Office of Agricultural Water Policy (OAWP). Agricultural projects, funded through cost-share funding from St. Johns River Water Management District (SJRWMD), to implement better fertilization and irrigation methods received credits for agricultural loading reductions beyond enrollment in BMPs.

TMDLs for Lochloosa Lake were adopted in 2017, and with this document are added to the Orange Creek BMAP. Loading reductions for this lake were calculated and assigned to local governments using techniques such as those used for the other lakes and are adopted with this document. The attenuation of loading was included in this TMDL and was included in the determination of allocated loading reductions and credits for projects that reduced loading.

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 March 31, 2015. Nine additional public meetings/workshops were held (June 22, 2015; August 6, 2015; January 29, 2016; June 30, 2016; August 25, 2016; November 16, 2016; April 4, 2017; October 25, 2017; and July 10, 2018) 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 12, 2015; May 28, 2015; December 14, 2015; January 28, 2016; February 24, 2016; March 29, 2016; May 11, 2016; and October 27, 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 November 28, 2018.

Table 1. Newnans Lake, Orange Lake, Lochloosa Lake, Alachua Sink, and Lake Wauberg TMDLs with loading and TP and TN concentration targets

Notes: WBID = Waterbody identification; lbs/yr = Pounds per year; mg/L = Milligrams per liter; NA = Not applicable
[1] Cross Creek TMDL includes loading from Lochloosa Lake Watershed.

Waterbody	WBID Number	Parameter	TMDL Starting Load (lbs/yr)	TMDL (lbs/yr)	Target Concentration (mg/L)	Wastewater Wasteload Allocation (lbs/yr)	Load Allocation (nonpoint) (lbs/yr)	Overall Needed Reduction (%)
Newnans Lake	2705B	TP	25,732	10,924	0.062	386	10,538	59
Newnans Lake	2819A	TN	315,510	85,470	0.97	3,104	82,366	74
Lochloosa Lake	2738A	TP	16,752	9,932	0.0552	NA	9,932	41
Lochloosa Lake	2738A	TN	416,142	172,318	1.152	NA	172,318	59
Cross Creek	2754	TP	5,090	3,530[1]		NA	3,530	31
Cross Creek	2754	TN	125,971	71,680[1]		NA	71,680	43
Orange Lake	2749A	TP	27,889	15,262	0.031	NA	15,262	45
Lake Wauberg	2741	TP	748	374	0.056	NA	374	50
Lake Wauberg	2741	TN	4,064	2,062	1.01	NA	2,062	51
Alachua Sink	2720A	TN	462,557	256,322		41,003	215,319	45

Chapter 2: TP Loading Updates and Data Sources

DEP developed the Orange Lake and Newnans Lake TMDL models based on 1995 land use. Lochloosa Lake TMDLs used Hydrological Simulation Program - FORTRAN (HSPF) hydrologic modeling completed by SJRWMD (Clapp and Smith 2015) to estimate watershed loadings based on 2009 land use information.

This chapter describes the adjustments and updates made in the watershed loading calculations. Changes in land use patterns were determined to be insufficient to justify the revision of the TMDL watershed loadings based on 1995 land use data. This chapter describes the justification for this decision. Loading numbers as determined by TMDLs were used for allocation, but the distribution of loading categories was based on 2009 land use patterns and the most recent available jurisdictional boundaries.

Loading Adjustments

Land Use Loading Changes

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.

Land use patterns from 1995 were compared with 2009 land use patterns to determine if current watershed loading estimates were adequate to develop allocations for Newnans Lake and Orange Lake. **Tables 2** and **3** list the 1995 and 2009 acreage of major land use categories for Newnans Lake and Orange Lake, respectively. There are other factors that complicate the comparison of land use changes. The period when aerial imagery was taken (dry or wet), the resolution of imagery, and the interpretation of data between periods can result in changes in land use that are not truly shifts in land use patterns.

Agricultural acreage based on the interpretation of aerial imagery and assignment of FLUCCS categories increased in both lake watersheds, while the acreage of urban land uses (residential housing, commercial, and institutional) increased in the Orange Lake Watershed. The total acreage of water and wetland increased in the Orange Lake Watershed, but only wetland acreage increased in the Newnans Lake Watershed. Both these watersheds have extensive acreage of forest and wetland land uses. A substantial area surrounding these lakes is in public ownership as conservation lands or privately owned as commercially harvested pine forest.

The lowest contribution of loading per acre (based on event mean concentrations [EMCs] and runoff coefficients) was attributed to forest and rangeland in the original TMDLs. Shifts in land use from forest and rangeland to urban and agricultural uses were used to estimate the potential increase in loading between 1995 and 2009. For the Newnans Lake Watershed, 1,397.2 acres of

forest and rangeland in 1995 were converted to urban land use in 2009, and 525.8 acres of forest and rangeland were converted to agriculture. For the Orange Lake Watershed, 1,657.2 acres of forest and rangeland in 1995 were converted to urban land use in 2009, and 2,854.2 acres of forest and rangeland in 1995 were converted to agriculture in 2009. The changes in land use acreages were not considered large enough to necessitate a modeling update to 2009 land use. TN and TP loadings estimated for 2009 land use acreage and rainfall amounts were within the range of loading values calculated over the years of TMDL development, supporting the decision not to update land use loadings (**Appendix A** provides details).

Table 2. Newnans Lake Watershed land use comparison, 1995 and 2009

Land Use Category	2009 Acres	1995 Acres	Difference in Acres
Agriculture	4,283.7	3,644.3	639.4
Mining	98.2	135.8	-37.5
Industrial	469.9	547.7	-77.8
Urban	7,268.4	7,352.0	-83.6
Forest/Rural Open	39,022.8	41,582.6	-2,559.9
Recreational	741.7	395.7	346
Rangeland	2,339.2	1,936.7	402.4
Water	5,831.3	6,081.7	-250.4
Wetlands	17,396.2	16,114.1	1,282.1
Transportation	1,830.3	1,529.8	300.5

Table 3. Orange Lake Watershed land use comparison, 1995 and 2009

Land Use Category	2009 Acres	1995 Acres	Difference in Acres
Agriculture	30,967.8	29,146.6	1,821.2
Mining	878	871.2	6.8
Industrial	81.8	100.8	-19
Urban	8,777	7,611.5	1,165.5
Forest/Rural Open	21,697.7	25,316.3	-3,618.6
Recreational	158.4	79.2	79.3
Rangeland	808.9	1,428.7	-619.8
Transportation	821	821	0
Water	6,211.2	5,659.7	551.5
Wetlands	17,465.4	16,889.7	575.7

Transportation

Allocations of loading reductions were assigned to FDOT, but to assign an allocation a more complete delineation of areas under FDOT jurisdiction was needed. Land use data identified divided state roads and classified them as transportation but did not identify non-divided state roads as transportation; nor were the potential stormwater management structures associated with state roads identified.

The width of non-divided state roads was estimated by buffering the roadway centerline with the width of a standard lane plus right-of-way. FDOT State Routes, published August 11, 2018, was used as the source data. FDOT provided data delineating roadside ditches and point locations of stormwater ponds and inlets. Ditch areas were added to roadway width, providing a more complete delineation of FDOT jurisdiction. **Appendix A** includes descriptions of analytical methods.

Orange Lake and Newnans Lake Modeled Boundaries

A portion of the Newnans Lake Watershed (south of the lake) was not included in TMDL development. That portion includes Prairie Creek and its watershed and was delineated and removed from allocations for Newnans Lake. The discharge from Prairie Creek was treated as an input into the Orange Lake Watershed but was not modeled or included in allocations for Orange Lake. **Figure 3** displays the Newnans Lake and Orange Lake boundaries used for allocations.

Minor adjustments were made to the Newnans Lake Watershed TMDL boundary along its border with the Santa Fe Basin and southern border with the area not modeled. The adjustment was made to align the Newnans Lake Watershed with more recent delineations done by SJRWMD for water supply modeling.

Lochloosa Lake and Cross Creek Modeling

The Lochloosa Lake and Cross Creek TMDL modeling was based on 2009 land use and used the HSPF watershed model to estimate watershed loadings. This is a different approach than that used to estimate watershed loadings for Orange Lake and Newnans Lake. The HSPF model estimates watershed loading from the buildup and washoff of pollutants, instead of using the specific EMCs of pollutants associated with land use types and estimates of pervious and impervious surface area. The HSPF model allows more detailed loading estimates and the refinement of basin hydrology by routing water through the watershed.

There are characteristics of the Lochloosa Lake and Cross Creek modeling that influence how source loadings are estimated and project credits applied to sources. The loading output from an individual sub-basin is attenuated by the watershed, and thus not all the loading generated by an individual sub-basin is delivered to Lochloosa Lake. The watershed was delineated into 13 sub-basins, each with its own loading output (**Figure 4**). The amount of attenuation that occurs is dependent on the length of the flow path (number of sub-basins traversed) before loading is delivered to the lake.

Location in the watershed is important. The attenuation factors were applied to individual sub-basin loadings and the assignment of sub-basin loading reductions to individual entities. The initial modeled loading was multiplied by the attenuation factor for each sub-basin that water moved through until it reached the Lochloosa Lake Sub-Basin. Attenuation is also factored into how much credit is assigned to projects or the implementation of BMPs.

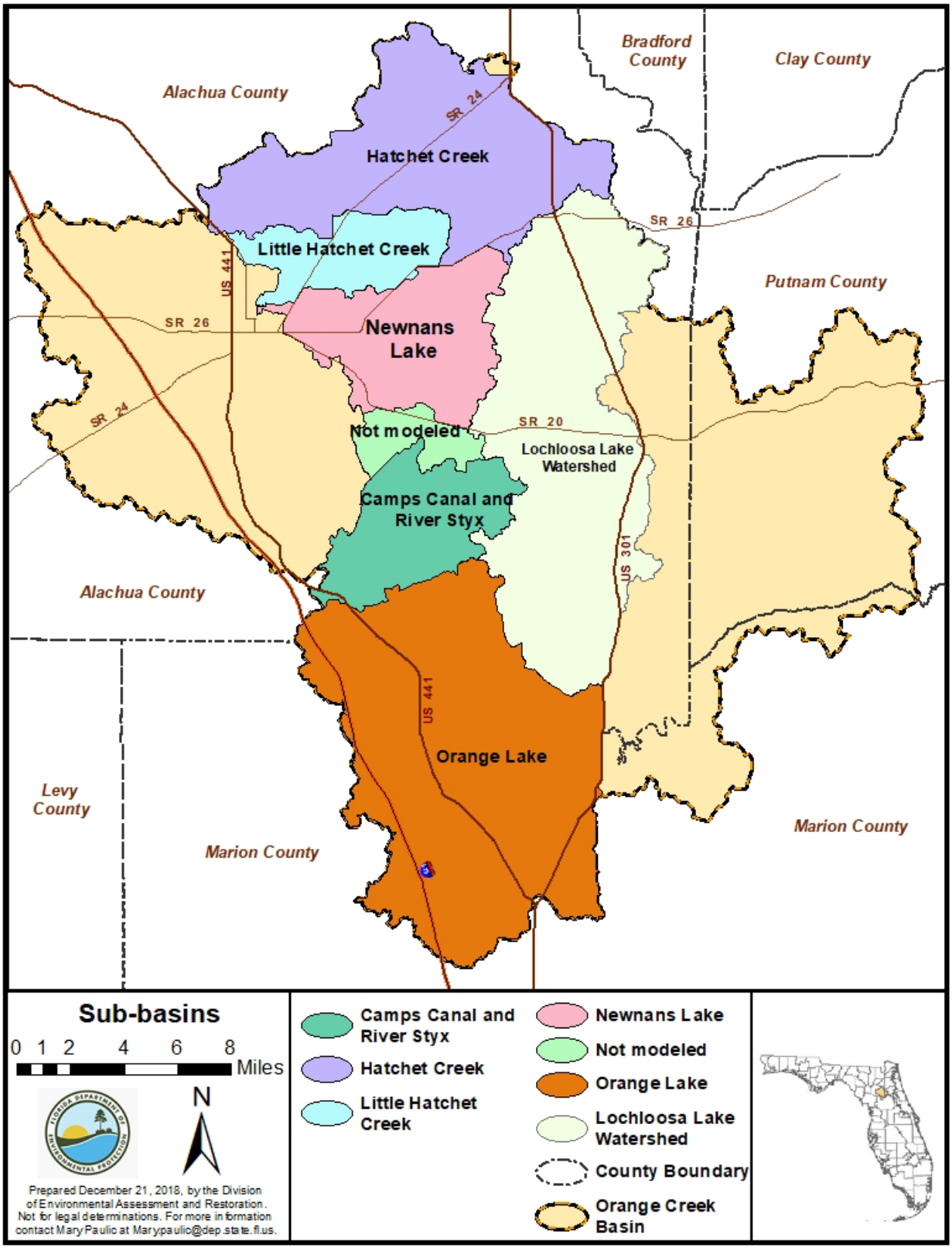

Figure 3. Newnans Lake and Orange Lake Sub-Basin boundaries used for allocation

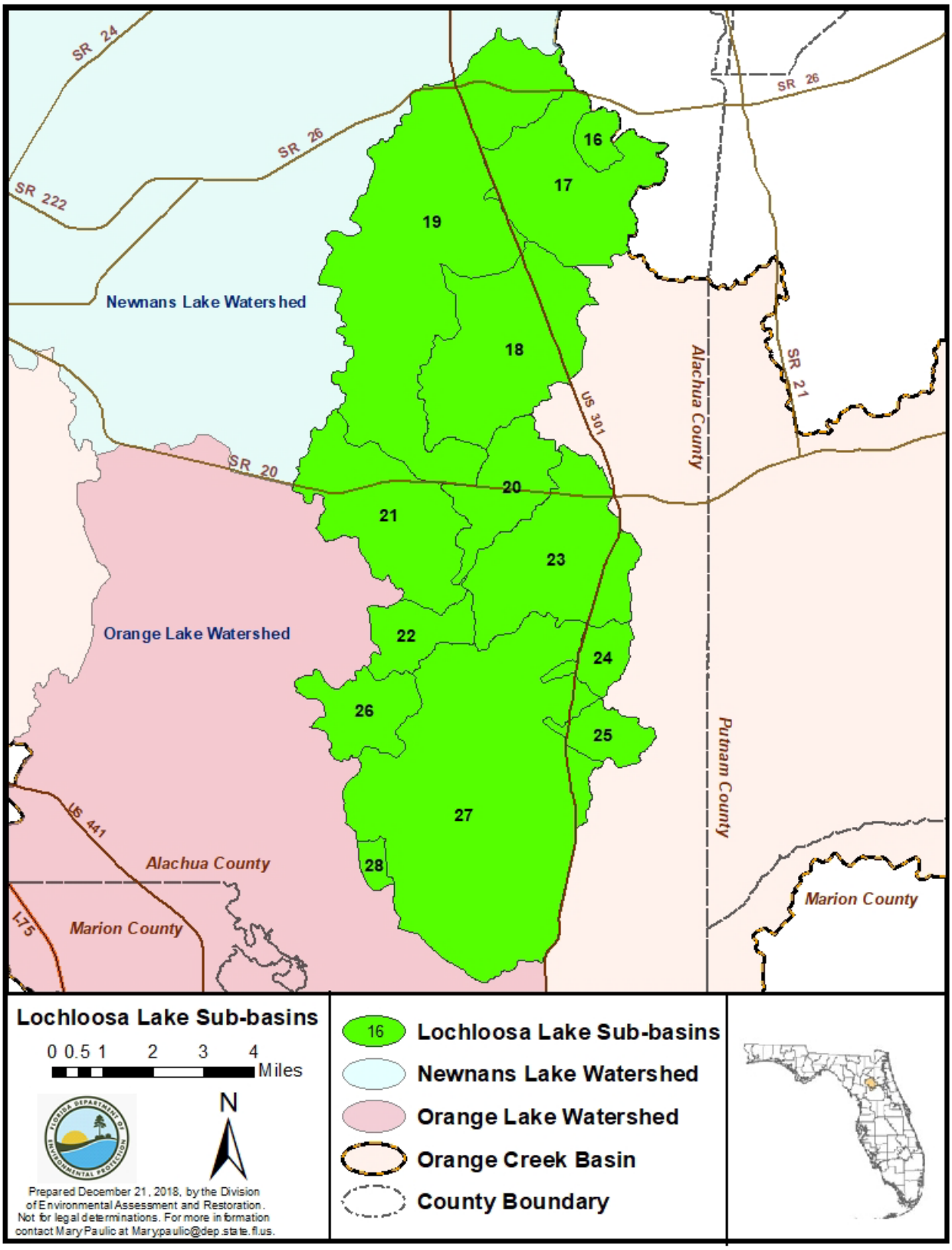

Figure 4. Lochloosa Lake Sub-Basin delineations

Table 4. Lochloosa Lake Sub-Basin flow paths

Source: Table 5.1.2 in Magley (2017).

Sub-Basin Number	Name	Acres	Sub-Basin Connection
16	Lake Elizabeth Creek	556.7	Flows into Sub-Basin 17
17	Morans Prairie	4,584.5	Flows into Sub-Basin 19
18	Unnamed Slough North	5,746.0	Flows into Sub-Basin 19
19	Lochloosa Creek State Road (SR) 20	12,949.5	Flows into Sub-Basin 21
20	Unnamed Slough South	2,248.2	Flows into Sub-Basin 21
21	Lochloosa Creek South	4,603.3	Flows into Sub-Basin 22
22	Lochloosa Creek	1,444.2	Flows into Sub-Basin 27
23	West Hawthorne Branch	5,071.8	Flows into Sub-Basin 27
24	Lake Jeffords	887.7	Flows into Sub-Basin 27
25	Unnamed Drain	1,020.3	Flows into Sub-Basin 27
26	Watson Prairie	1,849.9	Flows into Sub-Basin 27
27	Lochloosa Lake	15,306.0	Flows into Sub-Basin 28
28	Cross Creek	321.3	Discharges to Orange Lake

Septic System Delineation

Septic system contributions, when included in watershed loading estimates, represent septic systems located within 200 meters of the waterbody shoreline, tributaries, or other connected drainage pathways discharging to the waterbody. The distance for inclusion of septic systems loading was agreed on by the Orange Creek Basin Working Group (BWG). Loadings from septic systems were included in the Orange Lake and Newnans Lake TMDLs and included in allocations for individual jurisdictions for those lakes, but allocations were not assigned to FDOT. Septic systems were evaluated in the Lochloosa Lake TMDL analysis as a potential source but were not included as a separate loading source for TMDL modeling. Instead septic system loading is included as part of the watershed loading.

Locating septic systems within 200 meters of waterbodies required the creation of a data layer that identified a 200-meter buffer around the lakes and defined the connected drainage pathways into the lakes. National Hydrography Dataset (2016) at both 1:100,000 scale and 1:24,000 scale maps were used to identify lake areas, flow paths, and connected drainage pathways. Wetlands were included where they were part of the lake's littoral zone or within a connected drainage pathway (streams/canals enter or exit). Isolated lakes or ponds, streams/canals, wetlands, and expected internal drainage areas were not included. As a result, septic systems located in the southern and southwestern parts of the Orange Lake Watershed were not included in the buffer. **Figure 5** displays the created buffer and the septic systems within it.

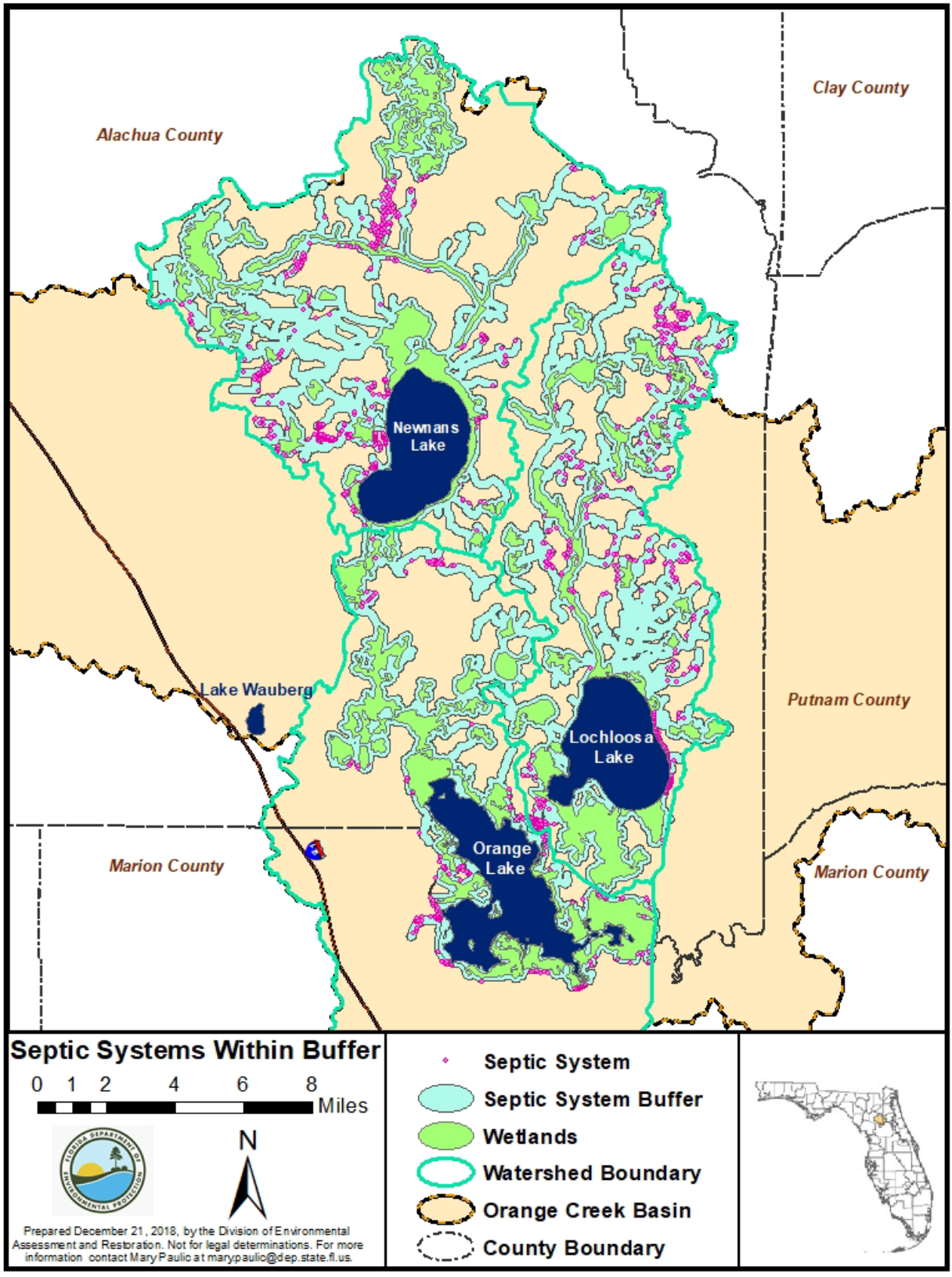

Figure 5. Location of 200-meter buffer around lakes with identified septic systems

Septic system locations were obtained from parcel information collected for the Florida Department of Health (FDOH) Florida Water Management Inventory Project data collected in 2016.[2] The only systems included were those categorized as known septic or likely septic based on the certainty of locational information. **Appendix A** contains complete descriptions of analytical methods.

Agricultural BMPs and Project Reductions

Table 5 summarizes the agricultural acreage under NOIs to implement BMPs and provides estimated loading reductions from the NOIs. Acreages used for NOI implementation reflect the acres of land use modeled as agriculture in each TMDL watershed and not the total acreage that may be listed as part of an NOI. Part of the acreage included with an NOI is not typically considered an agricultural land use, e.g., driveways, wetlands, homes. The loading from lands covered by NOIs was calculated from the total agricultural loading as the proportion of the land under NOIs 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 July 31, 2018. This percentage 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. As an example, if 20 % of agricultural acreage is covered by NOIs, then 20% of the total agricultural loading was assigned to the NOI. The final reduction is credited as 30 % of the NOIs loading.

Agricultural BMPs in the Lochloosa Lake Watershed were assigned a reduction based on the attenuated loading for the sub-basin where they are located. For properties situated in more than one sub-basin, loading reductions were calculated in proportion to the percent area of the property in each sub-basin.

NOIs cover more acreage in the Orange Creek Basin than was modeled for the impaired waterbodies with TMDLs. Active agriculture is present in parts of the Orange Creek Basin that do not currently have nutrient-impaired waterbodies. Overall, NOIs cover 17,086 acres identified as agricultural from 2009 land use data. Additional acreage in the basin may be under NOIs but is not accounted for in the total modeled acreage. Possible reasons for this are that 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.

Table 5 lists the estimated maximum credit that could be obtained by implementing NOIs for each lake. The maximum credit represents 100 % of modeled agricultural land covered by NOIs and should only be considered as a planning goal. FDACS is revising the methods and data sources used to estimate active agricultural acreage in the Orange Creek Basin on an annual basis. FDACS maintains the Florida Statewide Agricultural Irrigation Demand (FSAID) geodatabase, which estimates active agricultural acreage throughout the state, including in the

[2] http://www.floridahealth.gov/environmental-health/onsite-sewage/research/flwmi/index.html.

Orange Creek Basin. Future annual reporting efforts will address the amount of agricultural acreage as well as changes in total acreage, and the 5-year review and updates to this document will reflect any necessary adjustment.

Table 5. Summary of agricultural acreage covered by NOIs

NA = Not applicable
[1] Lochloosa Lake has multiple types of agricultural crops. Total acreage was aggregated across type of crop.
[2] Hogtown Creek and Orange Creek are not impaired for nutrients; thus there is no estimated agricultural loading for these watersheds.
[3] Maximum reduction in loading achieved is a planning target based on all modeled acreage covered by an NOI.

Watershed	Total/Modeled Agricultural Acres	Total/Modeled Acres Covered by NOIs	Reduction in Loading from NOIs (lbs-TP/yr)	Reduction in Loading from NOIs (lbs-TN/yr)	Maximum Reduction in Loading from NOIs (lbs-TP/yr/ lbs-TN/yr) [3]
Newnans Lake	3,487.6	603.9	29	199	157/445
Orange Lake	30,811.3	10,014.4	584	NA	1,796
Lochloosa Lake[1]	5,627	1,377.4	161	1,419	760/6,795
Alachua Sink	5,727.2	605.8	NA	363	3,430
Lake Wauberg	79.3	15.3	5	35	27/181
Hogtown Creek[2]	1,321.1	98.2	NA	NA	NA
Orange Creek[2]	24,391.3	4,226.8	NA	NA	NA

SJRWMD has been actively engaged in the Silver Springs Basin by providing cost-share funding for producers to implement more resource-efficient irrigation and fertilization practices. The Lochloosa Lake and Orange Lake Watersheds have benefited from these cost-share projects. **Table 6** lists the TN and TP reductions expected from better irrigation and fertilization practices. The numbers in the table represent the loading reduction after a 30 % efficiency was applied to the calculated reductions. In addition, for Lochloosa Lake the attenuation factor for the sub-basin where the project was located was applied to the calculated reduction in addition to a 30 % efficiency. The largest reductions from projects were achieved in the Orange Creek Watershed.

Table 6. Summary of SJRWMD agricultural project credits

Watershed	Reduction in Loading from Projects (lbs-TP/yr)	Reduction in Loading from Projects (lbs-TN/yr)
Orange Lake	691	NA
Lochloosa Lake	186	605
Orange Creek	7,833	46,962

Nutrient Budgets

A nutrient budget outlining nutrient sources and the amount of loading by each source was developed for each lake TMDL based on the categories of land use identified in the respective TMDL modeling. There are differences between the TMDLs on how land use data were

interpreted to develop loadings. **Table 7** lists modeled land use types. Types of land use are aggregated into broader categories for the development of nutrient budgets and allocations as well as for comparison purposes (**Table 7**).

Table 8 summarizes the net loading for Alachua Sink and Lake Wauberg which includes credits from stormwater management projects and the implementation of agricultural BMPs. Project reductions for developed land with stormwater BMPs through December 2018 and agricultural BMPs through July 31, 2018, were included. Allocations were not developed for these waterbodies. Lake Wauberg is surrounded largely by state-owned land, and a large wetland treatment system project completed for Alachua Sink addresses the wasteload allocation portion of the TMDL. Additionally, some of the loading into Alachua Sink will be addressed through projects in the Newnans Lake Watershed.

The nutrient budgets for Lake Wauberg and Alachua Sink include reductions for projects that were completed and continue to be maintained by FDOT and local governments to reduce stormwater loadings from developed land. **Appendix B** contains detailed budgets, including specific project reductions.

Table 7. Summary of modeled land use types

[1] Categories were separated, and individual estimates of loading made for each one for allocation purposes.
[2] For allocation, wetlands nonreach loadings were included with wetlands.

General Category	Lake Wauberg	Orange Lake, Newnans Lake, and Alachua Sink	Lochloosa Lake
Agriculture	Agriculture	Agriculture	Agriculture General–Crops Pasture Tree Crops
Forest	Forest	Forest/Rural Open[1]	Forest Forest Regeneration
Stormwater Undeveloped Uses	Rangeland Water Wetland	Rangeland Water/Wetlands	Rangeland Water Wetlands Wetlands Nonreach[2]
Stormwater Developed Uses	Urban Transportation	Low-Density Residential Medium-Density Residential High-Density Residential Urban Open Transportation/Communication Rural Open	Low-Density Residential Medium-Density Residential High-Density Residential Industrial and Commercial Mining Open Land and Barren Land

Table 8. Revised source loading summary for Lake Wauberg and Alachua Sink

NA = Not applicable.
Note: Agricultural BMP credits through July 2018 and stormwater project credits through December 2018 were applied.
[1] Point source loading and developed land use loading were combined.
[2] Prairie Creek loading was adjusted for Newnans Lake projects at 45 % of Newnans Lake credit.
[3] Developed and undeveloped land use loadings were not separated.

Sources	Lake Wauberg Net Estimated Load TP (lbs-TP/yr)	Lake Wauberg Net Estimated Load TN (lbs-N/yr	Alachua Sink Net Estimated TN Load (lbs-N/yr)
Atmospheric Deposition	NA	NA	23
Point Sources	NA	NA	NA[1]
Stormwater Runoff Undeveloped Land Use	NA[3]	NA[3]	72,252
Agricultural Runoff	NA[3]	NA[3]	11,071
Agricultural BMPs	NA[3]	NA[3]	-363
Stormwater Runoff Developed	469[3]	2,566[3]	28,861
Stormwater BMPs	-39	-199	-138,190
Septic Systems	240	1,299	4,667
Prairie Creek	NA	NA	210,444[2]
Newnans Lake Projects			-2,304
Loading Information			
Net Loading	**709**	**3,865**	**322,084**
TMDLs	**374**	**2,062**	**256,322**
Additional Reduction Needed	**335**	**1,803**	**65,762**

Table 9 summarizes the loading numbers for Newnans Lake, Orange Lake, and Lochloosa Lake. These are the basis for allocations for these lakes and do not include credits for stormwater improvement projects or agricultural BMPs. Project credits are later added back to each 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.

Newnans Lake and Orange Lake were modeled using 1995 land use data. When compared with the 2009 land use data, several categories were found that were not present in the 1995 land use. This was largely the result of development of land categorized as urban open into other developed uses. The 2009 land use categories were grouped into 1995 modeled categories based on similar EMCs and potential for impervious surface area runoff. This resulted in the following groupings:

- Urban Open: include parks and open land.
- Schools, Other Institutional, and Mining: treat as low-density residential.
- High-Density Commercial: treat as high-density residential.
- Industrial: treat as high-density residential.

Both Newnans Lake and Lochloosa Lake have substantial contributions of internal loading from sediment fluxes of nutrients included in their nutrient budgets. For Orange Lake, a large part of the lake's loading comes from upstream lakes.

Table 9. Nutrient source loading summary for Newnans Lake, Orange Lake, and Lochloosa Lake

Note: Stormwater project credits and agricultural BMP credits were not included.
[1]Stormwater runoff forest and point source loading were not allocated and not included in net baseline loading.

Sources	Newnans Lake Estimated TP Load (lbs-TP/yr)	Newnans Lake Estimated TN Load (lbs-TN/yr)	Orange Lake Estimated TP Load (lbs-TP/yr)	Lochloosa Lake Estimated TP Load (lbs-TP/yr)	Lochloosa Lake Estimated TN Load (lbs-TN/yr)
Point Source	386	3,104			
Stormwater Runoff Forest	1,767	28,243	594	1,698	24,325
Stormwater Runoff Undeveloped Land Use	3,371	31,850	3,363	1,203	16,669
Stormwater Runoff Developed Land Use	1,246	11,128	946	1,667	13,266
Agriculture	522	3,580	5,986	2,510	22,403
Septic Systems	256	1,870	390		
Atmospheric Deposition	3,223	6,446	2,941	4,248	72,825
Tributary Inflows			13,671		
Camps Canal (Newnans Lake)			10,344		
Cross Creek (Lochloosa Lake)			3,327		
Seepage/Groundwater	1,827	6,698			
Internal Nutrient Recycling	13,478	226,527		5,426	266,655
Loading Information					
Baseline Loading	**26,076**	**319,869**	**27,890**	**16,752**	**416,142**
Net Baseline Loading without Forest and Point Source[1]	**23,923**	**288,523**	**27,296**	**15,054**	**391,817**
TMDL	**10,924**	**85,470**	**15,262**	**9,932**	**172,318**
Required Loading Reduction to Meet TMDL	**12,999**	**203,053**	**12,034**	**5,122**	**219,499**

Chapter 3 : Calculating and Apportioning Loading Reductions for Newnans Lake, Orange Lake, and Lochloosa Lake

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 and FDOT for Newnans, Orange, and Lochloosa Lakes.

The apportionment of loading reductions follows these principles:

- Equitable approach:
    - Approach does not favor or burden any one stakeholder over another.
    - Credit for previous stormwater projects or efforts is 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.
- Loading reduction is proportional to the amount of loading generated in a jurisdiction.

Nutrient Budget Adjustments

Table 9 lists nutrient source loading budgets for Newnans, Orange, and Lochloosa Lakes. Before loading reductions can be allocated to jurisdictions, additional adjustments to the nutrient budgets must be made. Loadings from atmospheric deposition, undeveloped land, and, in some cases, 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. Additionally, Newnans Lake and Lochloosa Lake have large internal loading components that will need to be addressed as part of overall reductions.

The reductions that would be assigned to atmospheric deposition, undeveloped land, 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, undeveloped land, 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 for the apportionment of percent reductions among sources.

A large part of the basin's forest land is maintained and harvested for commercial use, in effect coming under NOIs for silviculture BMPs. The loading calculation for forest land is the same regardless of ultimate management and use. Forest land was removed from the baseline loading used for allocation, so that stakeholders with developed land would not be required to make additional loading reductions to compensate for forest land. Though forest does not have assigned loading reductions, these lands are subject to a management agreement. The location and potential for interaction with the clays of the Hawthorn Formation is important in the Orange Creek Basin. DEP and the Florida Forest Service agree to the following management points:

- Evaluate current and previous studies for insights that are applicable to the management of forests in the Orange Creek Basin, with emphasis on the role of the Hawthorn Formation in contributing phosphorus.

- Expand BMP signup by outreach to landowners, with a focus on smaller noncommercial forest tracts. Inventory practices used on private land (focus on pine straw production).

- Provide silviculture BMP education and training for landowners. Provide technical assistance when problems are identified.

- Evaluate the need for Orange Creek basin-specific BMPs for all land uses that occur in areas where the Hawthorn Formation is at or very near the surface.

- Evaluate opportunities to restore lands impacted by historical management practices. (Large public landowners should already be engaged in some level of restoration.)

- Evaluate the need to investigate "legacy" phosphorus materials, including their origin, fate, and treatability.

One National Pollutant Discharge Elimination System (NPDES) permitted wastewater treatment facility discharges to Little Hatchett Creek in the Newnans Lake Watershed. The Newnans Lake TMDL assigned a wasteload allocation to the facility. The wasteload allocation is the allowable loading for the point source in Newnans Lake nutrient budget, but it was not included as part of the loading allocated to local municipalities and FDOT.

Calculating Loading Reductions

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

Interpreting Land Use Data for Loading Reductions

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

The Gainesville Planning Department Planning and Development Services GIS Section provided the City of Gainesville jurisdictional boundary dated October 2014. The Alachua County Growth Management Department GIS Services provided the jurisdictional boundaries for Waldo, Micanopy, and Hawthorn, dated April 2017, used to define the area of each watershed in each jurisdiction. Jurisdictional boundaries for McIntosh and Reddick in Marion County were obtained from U.S. Census Bureau Topologically Integrated Geographic Encoding and Referencing (TIGER) 2010 Places data. Unincorporated areas (outside a jurisdiction) were assigned to the county where they were located. The delineation of state roads under FDOT District 2 jurisdiction was described in **Chapter 2**. The 2009 land use data classified major divided highways as transportation. In the Orange Lake Watershed, land use data were adequately classified as transportation and in Marion County were assigned to FDOT District 5.

Adjusting Land Use Loading for Lochloosa Lake

Before allocations could be calculated for Lochloosa Lake, adjustments for watershed attenuation were made. An attenuation rate was applied to the modeled loading output for each sub-basin to adjust for watershed attenuation. The sub-basin attenuation rate is the ratio of the output loading over the input loading for that sub-basin. The rates vary by year and are different for TN and TP. **Appendix C** lists the attenuation rates for each year by sub-basin.

The modeled sub-basin loading for each year is multiplied by the attenuation rate for that sub-basin for each TMDL model year, and then an average is taken over the entire period of TMDL development. Depending on the distance of a sub-basin from Lochloosa Lake, additional attenuation is applied for each sub-basin that the loading will enter before discharge to the lake. The average attenuation for a sub-basin, including additional attenuation for distance from the lake, is used for estimating the loading from a sub-basin for allocation purposes. **Table 4** and **Figure 4** outline how water and loading move through the Lochloosa Lake Watershed. **Appendix C** provides an example.

Table 10. Percent developed land use by sub-basin and jurisdiction for Newnans Lake and Orange Lake

Lake	Sub-Basin	Jurisdiction	Communication and Transportation (%)	High-Density Residential (%)	Low-Density Residential (%)	Medium-Density Residential (%)	Urban Open (%)	Rural Open (%)
Newnans Lake	Hatchet Creek	Alachua County	19.2	18.5	90.5	85.6	82.6	100.0
Newnans Lake	Hatchet Creek	Gainesville	1.6	79.9	0.4		16.0	
Newnans Lake	Hatchet Creek	FDOT, District 2	79.2					
Newnans Lake	Hatchet Creek	Waldo		1.6	9.1	14.4	1.4	
Newnans Lake	Little Hatchet Creek	Alachua County	1.1	9.6	39.1	4.2	2.0	
Newnans Lake	Little Hatchet Creek	Gainesville	86.1	90.4	60.9	95.8	98.0	100.0
Newnans Lake	Little Hatchet Creek	FDOT, District 2	12.8					
Newnans Lake	Little Hatchet Creek	Waldo						
Newnans Lake	Newnans Lake	Alachua County	2.3	29.1	80.4	42.6	8.8	100.0
Newnans Lake	Newnans Lake	Gainesville	12.4	70.9	19.6	57.4	91.2	
Newnans Lake	Newnans Lake	FDOT, District 2	85.3					
Newnans Lake	Newnans Lake	Waldo						
Orange Lake	Orange Lake	Alachua County		2.7	8.5	3.8	6.9	0.8
Orange Lake	Orange Lake	Marion County	5.7	87.3	83.1	61.3	88.2	99.2
Orange Lake	Orange Lake	FDOT, District 2	9.0					
Orange Lake	Orange Lake	FDOT, District 5	85.3					
Orange Lake	Orange Lake	McIntosh		5.9	2.3	21.2	3.1	
Orange Lake	Orange Lake	Micanopy		1.5	1.2	13.8	1.9	0.0
Orange Lake	Orange Lake	Reddick		2.6	4.8			
Orange Lake	Camps Canal River Styx	Alachua County	5.1	14.4	75.8			100.0
Orange Lake	Camps Canal River Styx	Marion County						
Orange Lake	Camps Canal River Styx	FDOT, District 2	94.9					
Orange Lake	Camps Canal River Styx	FDOT, District 5						
Orange Lake	Camps Canal River Styx	McIntosh						
Orange Lake	Camps Canal River Styx	Micanopy		85.6	24.2	100.0		
Orange Lake	Camps Canal River Styx	Reddick						

Table 11. Percent developed land by jurisdiction and sub-basin for Lochloosa Lake

Sub-Basin	Jurisdiction	Communication and Transportation (%)	High-Density Residential (%)	Low-Density Residential (%)	Medium-Density Residential (%)	Industrial and Commercial (%)	Mining (%)	Open Land (%)
16	Alachua County			100.0				
16	FDOT, District 2							
16	Hawthorne							
17	Alachua County			100.0				100.0
17	FDOT, District 2	100.0						
17	Hawthorne							
18	Alachua County			100.0		100.0		
18	FDOT, District 2	100.0						
18	Hawthorne							
19	Alachua County			100.0	100.0	100.0		100.0
19	FDOT, District 2	100.0						
19	Hawthorne							
20	Alachua County			98.4		48.8		98.5
20	FDOT, District 2	100.0						
20	Hawthorne			1.6		51.2		1.5
21	Alachua County	100.0		100.0			100.0	100.0
21	FDOT, District 2							
21	Hawthorne							
23	Alachua County			54.0		3.6		1.6
23	FDOT, District 2	100.0						
23	Hawthorne		100.0	46.0	100.0	96.4		98.4
24	Alachua County			98.8				
24	FDOT, District 2	100.0						
24	Hawthorne			1.2				
25	Alachua County			100.0				
25	FDOT, District 2	100.0						
25	Hawthorne							
26	Alachua County			100.0				
26	FDOT, District 2							

Sub-Basin	Jurisdiction	Communication and Transportation (%)	High-Density Residential (%)	Low-Density Residential (%)	Medium-Density Residential (%)	Industrial and Commercial (%)	Mining (%)	Open Land (%)
26	Hawthorne							
27	Alachua County			100.0	100.0	100.0		100.0
27	FDOT, District 2	100.0						
27	Hawthorne							

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 sub-basin was calculated for each jurisdiction. **Table 10** lists the results for Newnans Lake and Orange Lake. **Table 11** contains the results for Lochloosa Lake.

The assumption is that only the total acreage of a specific source differs from the calculations 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 is 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.

Septic System Loading

Loadings from septic systems were calculated for Newnans Lake and Orange Lake. The TMDL analysis for Lochloosa Lake evaluated septic system loading but did not include it as a separate source when calculating TMDL reductions.

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. Stakeholders agreed to this distance and, based on a literature review, 200 meters is 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 both lakes, 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, there were 312 septic systems in the Newnans Lake Sub-Basin, with 92.3 % in Alachua County, and thus Alachua County is assigned 92.3 % of the proportional loading reduction for septic systems.

Total Reductions

The total loading reduction assigned to each jurisdiction is the sum of reductions for developed land uses and septic systems/groundwater seepage. **Tables 12** and **13** summarize the allocated total reductions assigned to each jurisdiction for TP and TN, respectively. The entire reduction may be achieved by addressing stormwater loading from urban and agricultural areas. Local regulations may provide a mechanism or incentive to convert from septic systems to central sewer. The City of Gainesville Code of Ordinances requires the implementation of applicable sections of FDOH Chapter 64E-6, F.A.C.

The Florida Springs and Aquifer Protection Act may be a second mechanism for addressing septic systems located within the contributing areas of Outstanding Florida Springs through the implementation of BMAPs focused on those spring systems. Both Newnans Lake and Lochloosa Lake have large contributions in loading from internal loading that are not accounted for in the assignment of reductions to local jurisdictions.

Table 12. Summary of TP loading (lbs-TP/yr) reductions for developed land use and septic system/groundwater seepage for Newnans Lake, Orange Lake, and Lochloosa Lake

Jurisdiction	Newnans Lake Developed Land Use Reduction	Newnans Lake Septic System Reduction	Orange Lake Developed Land Use Reduction	Orange Lake Septic System Reduction	Lochloosa Lake Developed Land Use Reduction	Total TP Reduction Assigned to Jurisdiction
Alachua County	465	198	38	60	411	**1,172**
FDOT, District 2	93	0	15	0	321	**429**
FDOT, District 5			99	0		**99**
Marion County			319	120		**439**
McIntosh			28	43		**71**
Micanopy			31	0		**31**
Reddick			12	0		**12**
Waldo	27	0				**27**
Gainesville	461	16				**477**
Hawthorne					156	**156**
Total Reduction Developed Land Use and Septic Systems	**1,046**	**214**	**542**	**223**	**888**	**2,913**

Table 13. Summary of TN loading (lbs-TN/yr) reductions for developed land use and septic system/groundwater seepage for Newnans Lake, Orange Lake, and Lochloosa Lake

Jurisdiction	Newnans Lake Developed Land Use Reduction	Newnans Lake Septic System Reduction	Lochloosa Lake Developed Land Use Reduction	Total TN Reduction Assigned to Jurisdiction
Alachua County	4,155	1,448	4,055	**9,658**
FDOT, District 2	878	0	3,674	**4,552**
Waldo	239	0		**239**
Gainesville	4,094	113		**4,207**
Hawthorne			1,902	**1,902**
Total Reduction Developed Land Use and Septic Systems	**9,366**	**1,561**	**9,631**	**20,558**

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 the 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.

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 D**. Projects listed in the appendix are organized alphabetically by jurisdiction.

Table 14. Education credit components

Activity	Credit (%)	Activity Details
Florida Friendly Landscaping (FFL) Program	3.00	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	Municipal Separate Storm Sewer System (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. Education credits were not assigned to Lake Wauberg, because a large part of the contributing watershed is in state ownership and allocations were made to the watershed. Education credits were calculated for Alachua Sink based on the percent acreage of land in the Paynes Prairie Watershed that was not in state ownership but was either within Gainesville's city limits or Alachua County. Gainesville was assigned 884 lbs-TN/yr and Alachua County was assigned 1,900 lbs-TN/yr as education credits. Alachua Sink's stormwater loading estimates for developed land uses were based on the 2004 watershed loading, identified as the wet year for modeling purposes.

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. A jurisdiction can increase its education credit by adding program elements outlined in the table.

Both Marion County and Alachua County have active and fully supported Florida Yards and Neighborhood (FYN) Programs. City residents in those counties may participate in the county-supported FYN Program. For this reason, smaller municipalities in both counties were awarded 3 % credit for FYN Programs as part of their education credit. Alachua County is a charter county, and there are elements of county ordinances that apply within smaller jurisdictions. The Alachua County fertilizer code and water quality code apply throughout the county. All jurisdictions in Alachua County received 0.5 % credit for the fertilizer code. The irrigation code (days of the week and timing) applies in unincorporated Alachua County, Gainesville, and Hawthorne. An additional 0.5 % credit was awarded to Hawthorne and Gainesville for the irrigation code.

Crediting and Prioritizing Projects

Projects for which loading reduction credits were assigned include structural BMP retrofits, street sweeping, cessation of fertilizer use, and cleanout of BMPs. Project credits are cumulative starting with the 2008 adopted Orange Creek BMAP. **Appendix D** lists new projects not previously adopted. Project location was not considered for Orange Lake and Newnans Lake because the TMDL modeling did not include the watershed attenuation of loading; nor did it include stormwater BMPs.

For Lochloosa Lake, individual project reductions are attenuated based on the sub-basin where they are located and distance from the lake. Because attenuation rates vary by year, but project reductions are considered consistent across years, an average attenuation rate over the TMDL period was taken and used for project reductions. The calculated project loading reduction was adjusted for the average attenuation rate for the sub-basin where the project was located and the distance from Lochloosa Lake. **Appendix C** lists average sub-basin attenuation rates along with details about the calculations.

Reductions from projects in the Newnans Lake and Lochloosa Lake Watersheds are accounted for as reductions of tributary loading into Orange Lake. Part of the reduction provided by Newnans Lake projects is also assigned to Alachua Sink because a water reservation for Paynes

Prairie diverts 45 % of the flow in Prairie Creek to Paynes Prairie. The remaining 55 % continues downstream to Orange Lake. Newnans Lake projects are applied to Orange Lake as 55 % of their total credit. Project credits for Lochloosa Lake are assigned at 100 % credit for Orange Lake because of the short length of Cross Creek and its small contributing watershed.

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 (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 (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 Orange Creek 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 total mileage was not known, the percent of the jurisdiction in each TMDL watershed was used to apportion street sweeping credits. Alachua County Public Works provided the amount of material collected in each subdivision that could then be assigned to a specific watershed. Cleanout credits were assigned based on the TMDL watershed where the structure was located. If the volumes or weights of cleanout material could not be separated by watershed, then the credits were 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 D-1** 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," "conceptual," or “planned." 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.

Table 15. Education credits by jurisdiction

SW = Stormwater.
[1] Based on all entities receiving the maximum percentage of 6 % for educational activities.

Jurisdiction	Credit for Educational Activities (%)	Newnans Lake SW Loading TP (lbs/yr)	Newnans Lake TP Education Credits (lbs/yr)	Newnans Lake SW Loading TN (lbs/yr)	Newnans Lake TN Education Credits (lbs/yr)	Orange Lake SW Loading TP (lbs/yr)	Orange Lake TP Education Credits (lbs/yr)	Lochloosa Lake SW Loading TP (lbs/yr)	Lochloosa Lake TP Education Credits (lbs/yr)	Lochloosa Lake SW Loading TN (lbs/yr)	Lochloosa Lake TN Education Credits (lbs/yr)
Alachua County	**6.00**	555	33	4,976	299	67	4	772	46	5,585	335
FDOT, District 2	**4.00**	110	4	1,051	42	25	1	492	20	5,060	202
Gainesville	**6.00**	548	33	4,903	294						
Waldo	**3.50**	32	1	286	10						
Marion County	**5.50**					556	31				
McIntosh	**3.00**					48	1				
Micanopy	**3.50**					54	2				
Reddick	**3.00**					20	1				
Hawthorne	**4.00**							292	12	2,620	105
FDOT, District 5	**0.50**					172	1				
Total SW Loading		**1,245**	**71**	**11,216**	**645**	**942**	**40**	**1,556**	**78**	**13,265**	**642**
Maximum Education Credit[1]	**6.00**		**75**		**673**		**57**		**93**		**796**

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.

Managing TP Loadings

This section contains a table for each of the three allocated lakes that summarizes each jurisdiction's assigned loading reduction and education and project credits, as well as text describing the status of TMDL implementation for Lake Wauberg and Alachua Sink. In cases where local jurisdictions have met their allotted reductions, the value in the column "Final Reduction Needed" is 0.

For all waterbodies, a target period of 10 years, until 2028, 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 has a target completion date of 2028, though that reduction does not have to be specifically targeted to septic systems.

Education credits are assigned to the first 5-year period and maintained for the entire period of reduction activity. Credits are based on DEP's crediting scheme outlined in **Chapter 4, Determining Education Credits**. If additional educational activities are undertaken or changes are made to DEP's crediting scheme that increase crediting, then the additional credits will be added to the second 5-year period. Education credits calculated as less than 0.5 lbs-TP/yr are represented in the TMDL summary tables as 0. Education credits calculated between 0.5 and 1.0 lbs-TP/yr or lbs-TN /yr are represented in TMDL summary tables as 1.

Appendix D 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.

Atmospheric Deposition

Atmospheric deposition is typically calculated from the sum of rainfall and dry fall onto a lake surface. It can be a large amount of loading into the lakes given the large surface area for Newnans, Orange, and Lochloosa Lakes. The small watershed delineated for Lake Wauberg results in the surface of the lake as a dominant land use increasing the potential for atmospheric deposition to be a large source of nutrient loading into the lake. For TP, atmospheric deposition contributed 10.5 % to 25.4 % of total loading, while for TN, atmospheric deposition contributed 2 % to 17.5 % of total loading. For some cases the calculated loading for atmospheric deposition was greater than the TP or TN loading for developed land uses (Newnans and Lochloosa Lakes). Published values for concentrations of TN and TP were used for Newnans and Orange Lakes, and a rainfall station located near Lake Apopka was used for Lochloosa Lake. For purposes of allocation, atmospheric deposition was treated as a locally uncontrolled source of nutrients.

Internal Loading of Nutrients

When phosphorus enters a lake, a large portion of it may remain in the lake stored in sediment. Osgood (2016) noted that more than 90 % retention is common. The phosphorus in the sediment can recycle back into the water column, delaying water quality restoration even after external watershed sources have been reduced or eliminated. The recycled nutrient is not a new source, but rather the remobilization of phosphorus deposited from external sources. Welch and Cooke (2005) note that shallow eutrophic lakes such as Newnans Lake and Lochloosa Lake are more difficult to manage for trophic state because the rates of phosphorus release can be high. The accumulation of nutrient in sediment is dependent on several environmental factors, such as depth, residence time, wind-driven resuspension, redox potential, and diffusion processes of the

lake system (Ji et al. 2010). However, the most significant factor affecting the rate of nutrient accumulation is the overall rate of nutrient loading to the lake (Ji et al. 2010). Vollenweider (1975) and Shannon and Brezonik (1972) found that in-lake nutrient concentration and external lake loading are highly correlated.

The initial strategy for addressing the internal loading of nutrients is to focus on reducing nutrients from the watershed, to reduce the rate of nutrient loading, for the first five-year period. It is not known what the effect on recycling rates will be if drastic reductions of nutrients from the watershed are achieved. Better data on lake recycling rates and the distribution of nutrients in sediments (Project NEW39) are needed. Methods that directly reduce internal loading may be needed in the future to fully restore water quality.

Dredging and lake draw-downs have been used in Florida to remove sediments or compact sediments. Draw-downs, both natural and artificial, have been used in the Orange Creek Basin. In 1989 a short-term 90-day drawdown was completed (Gottgens and Crisman 1992) on Newnans Lake. Both techniques are short-term solutions, as they do not address loading entering a lake from its watershed.

Given the surface area of Newnans and Lochloosa Lakes and the amount of bottom that would need to be exposed, dredging and draw-downs are expensive. They are also problematic in this basin because of the presence of cultural artifacts in the bottom sediments of Newnans Lake and the transport and disposal of large volumes of material from both lakes.

Treatment with alum or comparable materials to bind phosphorus is used throughout Florida on lakes to inhibit the recycling of phosphorus from sediments or for the offline treatment of water to remove phosphorus before discharge into a downstream waterbody. Hybrid wetland treatment systems combine alum treatment of water with additional filtering by wetland plants. Wetland filtering systems have also been used to treat lake water by removing particulate forms of phosphorus and suspended solids (e.g., Lake Apopka Constructed Marsh Flow-way).

Gizzard shad harvesting was tried on Newnans Lake as a way to remove some the potential internal loading. Harvest was stopped after one year because there were not enough fish to sustain continued harvest.

Newnans Lake

Newnans Lake is a shallow lake with a maximum depth of no more than 12 feet and a mean depth of 5 feet (Gao and Gilbert 2003). A large drainage area north and west of the lake supplies inflow via 3 streams: Hatchet Creek, Little Hatchet Creek, and Lake Forest Creek. Hatchet Creek and Little Hatchet Creek are blackwater streams with naturally high color and frequently have high levels of TN. The lake's surface water outflow is through Prairie Creek.

Ji completed Pollutant Load Reduction targets for the lake in 2010. The TP target concentrations are similar, but the TN target vary substantially. A different trophic state target was used.

The geology of the area is dominated by the phosphate-clay rich Hawthorn Group, which is relatively impermeable and acts as a confining layer separating surface water from the influence of the Floridan aquifer. The erosion of tributary streambeds and streambanks has exposed the phosphatic clays of the Hawthorn, allowing the transport of phosphate to the lake. The channelization of Little Hatchet Creek on the site of the Gainesville Airport accelerated erosion and the transport of phosphate to the lake.

After adjusting for the removal of loading from forest land and a point source, 12,999 lbs-TP/yr (**Table B-1a**) will need to be removed to meet the TMDL of 10,924 lbs-TP/yr. Of the total TP reduction, 1,260 lbs-TP/yr is assigned to developed land uses and septic systems, and 438 lbs-TP/yr is attributed to agriculture.

After adjusting for the removal of loading from forest land and a point source, 203,053 lbs-TN/yr (**Table B-1b**) will need to be removed to meet the TMDL of 85,470 lbs-TN/yr. Of the total TN

reduction, 10,927 lbs-TN/yr is assigned to developed land uses and septic systems, and 2,989 lbs-TN/yr is attributed to agriculture.

Internal TP and TN loading is substantial for this lake. TP internal loading accounts for 51.7 % of TP loading, while TN internal loading provides 70.8 % of the lake's TN loading, by far the largest contributor of nutrients. Removing loading inputs from the watershed may help reduce the internal load.

Through July 2018, 604 acres of agricultural land are under an NOI. Loading reductions for agricultural BMPs are 29 lbs-TP/yr and 199 lbs-TN/yr. There are no agricultural projects located in this watershed.

Silviculture represents a large part of the land use in the Newnans Lake Watershed. Most of the silviculture acreage in the watershed is managed by several large industrial operators, as well as conservation lands managed by SJRWMD and Alachua County, all of whom are participating in the Florida Forest Service BMP program. Other agricultural activities, such as blueberry farms, are present in the watershed. Nutrient loadings left from a legacy dairy operation were investigated as a source and follow-up water quality sampling was performed. Additional sampling is recommended to confirm current water quality and loading from the blueberry operation. Potential hydrologic alteration from earlier silviculture practices may also be a potential source of nutrients to the lake (Lippincott 2011).

Table 16 identifies the jurisdictions assigned a TP loading reduction for this waterbody. Combined credits for projects and education activities will reduce allocated TP loadings by 897 lbs/yr.

Table 17 identifies the jurisdictions assigned a TN loading reduction for Newnans Lake. Combined credits for projects and education activities will reduce allocated TN loadings by 5,158 lbs-TN/yr.

The reduction of loading in the watershed is one method for addressing the large internal loading source. Efforts by Alachua County to remediate incised channels and erosion problems on Little Hatchet Creek will add further large watershed loading reductions. A second effort by the county is directed at inventorying and evaluating conditions in the Hatchet Creek Watershed. The City of Gainesville is preparing a watershed management plan for the Lake Forest Creek tributary system that has the potential to define management actions to further reduce nutrient loading. Net reductions from these two efforts will potentially exceed the reductions of TN and TP needed for developed land uses.

Table 16. Newnans Lake loading 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. Septic systems are considered a developed land use. The total reduction is the sum of developed land use and septic systems. How a reduction is achieved is not specific to land use.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Remaining Developed Land Use Reduction with a Target Date of 2028	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	465	233	33	42	158	232	390	198	588
Gainesville	461	231	33	259	-61	230	169	16	185
FDOT, District 2	93	47	4	525	-482	46	-436	0	0
Waldo	27	14	1	0	13	13	26	0	26
Total	**1,046**	**525**	**71**	**826**		**521**	**149**	**214**	**799**

Table 17. Newnans Lake loading reductions and credits (lbs-TN/yr) by jurisdiction

*If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0. Septic systems are considered a developed land use. The total reduction is the sum of developed land use and septic systems. How a reduction is achieved is not specific to land use.

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 with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Remaining Developed Land Use Reduction with a Target Date of 2028	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	4,155	2,078	299	65	1,714	2,077	3,791	1,448	5,239
Gainesville	4,094	2,047	294	1,034	719	2,047	2,766	113	2,879
FDOT, District 2	878	439	42	3,414	-3,017	439	-2,578	0	0
Waldo	239	120	10	0	110	119	229	0	229
Total	**9,366**	**4,684**	**645**	**4,513**		**4,682**	**4,208**	**1,561**	**8,347**

Orange Lake

Orange Lake, a shallow lake with a relatively large surface area of 12,703 acres at median stage, naturally fluctuates between 2,745 and 15,600 acres, during drought and heavy rainfall, respectively (SJRWMD 2006). Major sources of water to the lake include interflow via Camps Canal and the River Styx from Newnans Lake and via Cross Creek from Lochloosa Lake, surface runoff from the watershed, and direct precipitation onto the lake. Water flows out of the lake through a group of sinkholes located in the southwest part of the lake at Heagy Burry Park and a notched, fixed-crest weir at the U.S. Highway 301 bridge into the headwater wetlands of Orange Creek.

Adjusting for the removal of forest loading, a total of 12,034 lbs-TP/yr (**Table B-2**) will need to be removed to meet the TMDL of 15,262 lbs-TP/yr. Of that total TP reduction, 765 lbs-TP/yr are assigned to developed land uses and septic systems in the watershed, 3,431 lbs-TP/yr are attributed to agriculture, and 7,837 lbs-TP/yr are assigned to Cross Creek and River Styx, accounting for inputs from Lochloosa Lake and Newnans Lake. Tributary inputs of nutrient account for 49 % of the total lake loading budget.

The largest developed land contributor to loading is agriculture. Agricultural NOI enrollment for Orange Lake is 10,014 acres, or 32.5 % of the modeled TMDL agricultural acres. BMP credit for this acreage is 584 lbs-TP/yr. SJRWMD funded several agricultural projects in the watershed to improve water conservation and reduce fertilizer use. Those projects reduce another 691 lbs-TP/yr, bringing the total reduction for agriculture to 1,275 lbs-TP/yr.

Orange Lake will benefit from projects implemented in the Newnans Lake and Lochloosa Lake Watersheds to decrease nutrient loading. The restoration of water quality in Newnans Lake may have the greatest benefit for Orange Lake, based on nutrient budget estimates of 37.1 % of loading into Orange Lake. TP reductions of 517 lbs-TP/yr are attributed to projects in the Newnans Lake Watershed. TP reductions of 1,226 lbs-TP/yr are attributed to the Lochloosa Lake Watershed.

A large portion of the Orange Lake Watershed is involved in commercial forestry, with most of this acreage held by several large industrial silviculture operators. All the large silviculture operators are participating in the Florida Forest Service BMP program. Analyses conducted before TMDL development indicated that nutrient loading from silviculture areas applying appropriate BMPs is roughly equivalent to loads from natural forest land uses. Besides silviculture, other primary agricultural activities in the watershed with adopted BMP manuals include horse farms and cattle operations. Marion County has the Clean Farms Initiative to assist local farmers with the implementation of BMPs, primarily for the management of animal waste and nutrients. The focus of this initiative is horse farms.

Orange Lake is regularly managed for nuisance and invasive aquatic plants by the Florida Fish and Wildlife Conservation Commission (FWC). The lake is also an important fish and wildlife habitat management area, and FWC periodically plants vegetation and scrapes exposed lake bottom to remove unconsolidated sediment to maintain habitat. FWC has prepared management guidance for Orange Lake.

Table 18 identifies the jurisdictions assigned a loading reduction for this waterbody. FDOT's fertilizer cessation and swale maintenance projects reduce loading enough to meet its entire 10-year period target loading reduction. Marion County has the largest allocation, at 439 lbs-TP/yr. Including education credits, Marion County will still need to reduce by another 408 lbs-TP/yr.

Table 18. Orange Lake loading 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. Septic systems are considered a developed land use. The total reduction is the sum of developed land use and septic systems. How a reduction is achieved is not specific to land use.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Remaining Developed Land Use Reduction with a Target Date of 2028	Total Septic System Reduction with a Target Date of 2028	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	38	19	4	0	15	19	34	60	94
FDOT, District 2	15	8	1	54	-47	7	-40	0	0
FDOT, District 5	99	50	1	2,934	-2,885	49	-2,836	0	0
Marion County	319	160	31	0	129	159	288	120	408
McIntosh	28	14	1	0	13	14	27	43	70
Micanopy	31	16	2	0	14	15	29	0	29
Reddick	12	6	1	0	5	6	11	0	11
Total	**542**	**273**	**41**	**2,988**		**269**		**223**	**612**

Lochloosa Lake

Lochloosa Lake has an estimated median area of 5,663 acres (Magley 2017), and its contributing watershed covers 56,186 acres (Lippincott 2011). It is a tributary of Orange Lake discharging to it through Cross Creek. The lake is designated as an Outstanding Florida Water (OFW) by DEP. The area around the lake is sparsely populated (Magley 2017).

The TP loading reduction needed after adjusting for the removal of forest loading is 5,122 lbs-TP/yr (**Table B-3a**) to meet the TMDL of 9,932 lbs-TP/yr. Of the total TP reduction, 888 lbs-TP/yr is allotted to developed land uses, and 1,469 lbs-TP/yr is attributed to agriculture.

The TN loading reduction needed after adjusting for the removal of forest loading is 219,499 lbs-TN/yr (**Table B-3b**) to meet the TMDL of 172,318 lbs-TN/yr. Of the total TN reduction, 9,631 lbs-TN/yr is allotted to developed land uses, and 16,265 lbs-TN/yr is attributed to agriculture.

For both TP and TN, the largest source of loading is internal recycling and resuspension from sediments. To meet the TMDLs, the internal load would have to be reduced by 2,894 lbs-TP/yr and 193,602 lbs-TN/yr. It is expected that reductions from the watershed will lead to reductions in internal loading, but it may be necessary in the future to directly address internal loading.

A large part of the lake watershed is forest, including commercially managed forest. Forest land contributes 24,325 lbs-TN/yr and 1,698 lbs-TP/yr of loading to the lake, comparable to the loading from all other types of agriculture.

NOIs cover 1,377 acres of the modeled TMDL watershed agricultural land use, and those acres account for loading reductions of 161 lbs-TP/yr and 1,419 lbs-TN/yr. Additional agricultural projects that reduce water use and fertilizer contribute reductions of another 185 lbs-TP/yr and 605 lbs-TN/yr. Combined agricultural BMPs and projects reduce TP loading by 346 lbs/yr and TN loading by 2,024 lbs/yr. More reductions in agricultural loading could be obtained through the full implementation of NOIs and additional projects to reduce fertilizer and water consumption on agricultural lands.

Table 19 lists the jurisdictions assigned a TP loading reduction for this waterbody, and **Table 20** identifies the jurisdictions assigned a TN loading reduction. FDOT's elimination of fertilizer on rights-of-way and medians and the implementation of better stormwater management with the widening of SR 20 provide enough credits for the agency to meet its TN and TP allocations. Alachua County and Hawthorne have education outreach credit but need additional reductions to meet their allocations.

Other potential contributions of loading to the lake are atmospheric deposition and groundwater inputs, including septic systems. Studies completed in 2006 by DEP and Florida State University concluded that both the surficial and intermediate aquifers were sources of pore water beneath Lochloosa Lake (Magley 2017). Groundwater seepage was higher along the northern and northwestern edges of the lake, as evidenced by radon-222 levels (Magley 2017), though seasonal fluctuations and rainfall affect the seepage rate.

Other areas in the lake's watershed have high rates of groundwater recharge (more than 8 inches per year) (Magley 2017). The TMDL supporting document estimated that the contribution of 92 septic systems within 200 meters of the lake could contribute as much as 2,593 lbs-TN/yr of loading to the lake (Magley 2017). The more extensive 200-meter Lochloosa Lake Watershed buffer used for this document contained 423 septic systems. Additional efforts to evaluate sources—particularly the potential role of legacy loading sources and land modifications in the watershed—are recommended.

Table 19. Lochloosa Lake loading 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. The target date for achieving loading reductions is 2028. Septic systems were included as part of the loading from basin runoff and not explicitly modeled.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	411	206	46		159	205	365
FDOT, District 2	321	161	20	802	-661	160	0
Hawthorne	156	78	12		66	78	144
Total	**888**	**445**	**78**	**802**		**443**	**509**

Table 20. Lochloosa Lake loading reductions and credits (lbs-TN/yr) by jurisdiction

*If project credits are greater than the total required reductions, then the remaining developed land use reduction is 0. The target date for achieving loading reductions is 2028. Septic systems were included as part of the loading from basin runoff and not explicitly modeled.

Jurisdiction	Total Developed Land Use Reduction	First 5-Year 50 % Developed Land Use Reduction	Education Credit	Project Credits	Remaining Developed Land Use Reduction with a Target Date of 2023	Second 5-Year 50 % Developed Land Use Reduction	Total Reduction to be Achieved with a Target Date of 2028*
Alachua County	4,055	2,028	335		1,693	2,027	3,720
FDOT, District 2	3,674	1,837	202	4,759	-3,125	1,837	0
Hawthorne	1,902	951	105		846	951	1,797
Total	**9,631**	**4,816**	**642**	**4,759**		**4,815**	**5,517**

Lake Wauberg

Lake Wauberg is located south of Gainesville in Paynes Prairie. It has a surface area of 248 acres, with a mean depth of 12 feet. The Lake Wauberg Watershed is largely undeveloped and bordered by limited rural residential development that relies on septic systems for wastewater management, a UF–owned recreation area near the lake, and Paynes Prairie State Preserve. Both the recreation area and State Preserve use septic systems for wastewater management. The lake is located close to U.S. Highway 441.

The bottom of the lake intersects the phosphate-rich Hawthorn Group, which influences its water quality. It is a naturally eutrophic lake. Historical water quality data indicate that TP has ranged from 0.06 to 0.26 milligrams per liter (mg/L) (Gottgens and Montague 1988).

The internal recycling of nutrients is a potential source that was not included in the TMDL analysis. The lake receives most of its recharge directly from rainfall. A large part of the watershed as defined by the TMDL is the lake surface.

The loading reduction needed for TP is 374 lbs-TP/yr and for TN 2,002 lbs-TN/yr (**Tables B-4a** and **B-4b**). Major sources of nutrient loading comprise developed land uses, septic systems, and agriculture. The cessation of fertilizer application on U.S. Highway 441 rights-of-way and medians is reducing loading to the lake by 34 lbs-TP/yr and 164 lbs-TN/yr. Agricultural NOIs cover 15.3 of the modeled agricultural acres in the watershed. The loading reduction from agricultural BMPs is 5 lbs-TP/yr and 35 lbs-TN/yr.

In 2018, DEP conducted shallow groundwater sampling to evaluate the extent of the nitrogen plume from the Paynes Prairie Preserves campground drainfield prior to repair. The septic systems located on Paynes Prairie Preserve date from the early 1980s and are beginning to fail but are being replaced as funding becomes available. Sampling will be repeated to document improvement. FDOH is using the information to establish setbacks from the lake edge for any replaced or new drainfield installation.

DEP proposes working with the UF Physical Plant to collect shallow groundwater samples downgradient of drainfields located on the university's recreational area property to test if plumes of nitrogen and phosphorus are intercepting the lake.

UF does not fertilize the landscape around the lake (Bill James, personal communication, 2011). Other potential sources of nutrient loading to Lake Wauberg are atmospheric deposition, the phosphatic-rich clays of the Hawthorn Group, and wildlife. There is active bird roosting along the shoreline at times during the year. Nutrient loading from bird defecation may contribute as much as 173 lbs-TN/yr and 54 lbs-TP/yr (Armstrong 2017).

It may be more appropriate to manage the nutrient concentrations in the lake rather than reduce watershed loadings as the management strategy for achieving the TMDLs. Additionally, since the watershed is largely undeveloped, and the Hawthorn Group is in contact with the lake

bottom, a re-evaluation of the TMDLs using numeric nutrient criteria (NNC) instead of the Trophic State Index (TSI) may be appropriate. The original TMDL was based on meeting a TSI of 60, which may be too low for a naturally eutrophic lake.

Alachua Sink

Alachua Sink is located on the northern edge of Paynes Prairie, south of the City of Gainesville. It consists of a small lake (Alachua Lake or the inundated portion of Paynes Prairie), with a corresponding solution sink (Alachua Sink) that recharges the Floridan aquifer. Prior to the Sweetwater Wetlands Park/Paynes Prairie Sheet Flow Restoration Project, there were two well-defined inflows into Alachua Sink: Sweetwater Branch and a canal connecting Alachua Lake to Alachua Sink.

Alachua Lake and the Main Street Water Reclamation Facility (WRF) are the major nonpoint and point sources of nutrient loading to Alachua Sink. The Alachua Sink TMDL defined contribution of loading is based on 2004 data, which are representative of a wet year used for developing load allocations and reductions. Nutrient sources to Alachua Lake include stormwater runoff into the Paynes Prairie Watershed and nutrients from Newnans Lake, transported via Prairie Creek. Overall, developed land uses and point sources provide 35.7 % of the TN loading, Prairie Creek provides 45.4 %, and undeveloped land uses provide 15.4 % (Gao et al. 2006).

The TMDL required loading reduction is 206,135 lbs-TN/yr (**Table B-5**). Overall reductions are 138,553 lbs-TN/yr, leaving 65,278 lbs-TN/yr unaccounted for in wet years. With the large contribution of loading attributed to Prairie Creek (Newnans Lake) when it is discharging to Paynes Prairie, greater reductions in TN are needed from the Newnans Lake Watershed.

Stormwater management, sediment and trash removal projects, and credits for education remove more than 138,000 lbs-TN/yr. Projects located in the Newnans Lake Watershed contribute 2,304 lbs-TN/yr in reductions. Newnans Lake projects are credited at 45 % of their reduction to account for only a portion of Prairie Creek flow diverted to Paynes Prairie. The largest remaining source of nutrients is the contribution from the Newnans Lake Watershed via Prairie Creek.

The Sweetwater Wetlands Park/Paynes Prairie Sheet flow Restoration Project (Project Number AS18) is the most significant project designed to address the Alachua Sink TMDL. The project has been operational since the end of 2016. Sweetwater Branch now discharges to a constructed polishing wetland located on Paynes Prairie, rather than through Sweetwater Canal into Alachua Sink, eliminating this direct discharge to the Floridan aquifer. The canal has been filled in, allowing water to sheet flow across Paynes Prairie. The Paynes Prairie Sheet Flow Restoration Project will achieve the wasteload allocation portion of the Alachua Sink TMDL by removing 125,106 lbs-TN/yr and 3,359 lbs-TP/yr.

The wasteload allocation comprises the loading from the Main Street WRF and urban stormwater that enters Sweetwater Branch. Additional TP loading reduction occurs at the Main Street WRF, before discharge to Sweetwater Branch, through chemical coagulation treatment which is estimated to remove 22,671 lbs-TP/yr. Treatment to reduce TN concentration occurs

downstream in the polishing wetland. The target TN and TP concentrations in the prairie after treatment by the polishing wetland are expected to be 1.47 and 0.1 mg/L, respectively. Regulatory requirements still need to be finished before the project is complete. Complete details about the project are available online.[3]

The City of Gainesville has achieved an additional 11,064 lbs-TN/yr and 6,706 lbs-TP/yr reduction through the construction of stormwater treatment and sediment and trash removal projects, stormwater collection system maintenance, and street sweeping. Additional TN loading reductions are contributed by Alachua County Public Works and FDOT sweeping of county and state roads in the watershed.

Agricultural NOIs cover 606 of the modeled agricultural acres, primarily cow/calf BMPs, in the watershed. This equates to a 363 lbs-TN/yr reduction in agricultural loadings.

[3] http://www.cityofgainesville.org/PublicWorks/ProgramsandServices/PaynesPrairieSheetflowProject.aspx

Chapter 5 : Commitment to Plan Implementation

Adoption Process

This Amendment is adopted by Secretarial Order and assigns TP and TN loading reductions to local governments and FDOT in the Newnans Lake, Lochloosa Lake, and Orange Lake Watersheds. It updates project status and provides potential management strategies for Lake Wauberg and Alachua Sink.

Tracking Reductions

This document sets a target date of 2028, 20 years after the initial adoption of the BMAP, for identifying management actions and to the extent possible achieving loading reductions for all listed waterbodies. Projects are updated annually allowing progress toward meeting the 2028 target and timelines for meeting water quality goals to be evaluated and adjusted as needed. 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 the DEP 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 improve water quality in the basin. FDACS will continue to report 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 part of the overall developed land loading with a target date of 2028 for achievement, that reduction does not have to specifically address septic systems. The status of the achievement of loading reductions is anticipated to be re-evaluated in 2023.

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/processes 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 of the 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.

Key Actions

The following actions are important to the continued success of implementing this BMAP and are recommended to occur by the next plan update in 2023.

- Complete evaluation of impact of septic systems on Lake Wauberg.
- Restart periodic collection of phytoplankton data (speciation and biovolume) for Lake Wauberg, Orange Lake, Newnans Lake, and Lochloosa Lake.
- Evaluate Lake Wauberg water quality for compliance with numeric nutrient criteria.
- Evaluate Newnans Lake sediment for nutrient content and contribution to in-lake nutrient loading.
- Identify Lochloosa Lake Watershed issues that contribute to impaired water quality.
- Reevaluation of Newnans Lake and Orange Lake Watershed loadings, considering whether or not to include more recent land use data, watershed loading methods comparable to Lochloosa Lake TMDL, and routing of water and loading between lakes.

Appendices

Appendix A: GIS Database Development and Loading Comparison

GIS Database Development

Models used for TMDL development estimated loadings by aggregating land use loading categories for each sub-basin in a TMDL watershed. The allocation of loading reductions to local jurisdictions necessitated the reassignment of watershed loadings by jurisdictional boundaries, a task that required 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 Orange Creek Basin from both 1995 and 2009. Including data for both years allowed changes in land use to be tracked. Large changes in land use patterns were not observed, and thus the updating of TMDL models with 2009 land use was not required. This was checked using a spreadsheet version of the Watershed Management Model (WMM). The land use acreage from 2009 was substituted for the 1995 land use acreage, but the rainfall data from the TMDL analysis were used. 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 Newnans Lake and Orange Lake Watersheds. **Table A-2** summarizes the land use codes used for allocating reductions in the Lochloosa Lake Watershed.

The watershed delineations used for Newnans and Orange Lakes were created during TMDL development and are described in the relevant TMDL documents. Small modifications were made to the Newnans Lake boundary to incorporate more recent hydrologic information from SJRWMD. SJRWMD supplied the delineation of the Lochloosa Lake Watershed and subwatersheds used for modeling and allocation purposes.

The Gainesville Planning Department Planning and Development Services GIS Section provided the City of Gainesville jurisdictional boundary dated October 2014. The Alachua County Growth Management Department GIS Services provided jurisdictional boundaries for Waldo, Micanopy, and Hawthorn, dated April 2017, used to define the area of each watershed in each jurisdiction. Jurisdictional boundaries for McIntosh and Reddick in Marion County were obtained from U.S. Census Bureau TIGER 2010 Places data. Unincorporated areas (outside a jurisdiction) were assigned to the county where they are located.

Chapter 2, Transportation summarized the delineation of state roads within FDOT District 2 jurisdiction. The 2009 land use data classified major divided highways as transportation, and that land use classification was used to assign allocations to FDOT. Portions of state roads in the Gainesville and Alachua County area (Newnans Lake and Lochloosa Lake Watersheds) are not divided and not identified on land use data layers as transportation. To more accurately reflect FDOT's jurisdiction, a 22-foot-wide buffer was added to each side of the centerline of these

undivided state roadways (FDOT State Routes data layer August 11, 2018) to capture the paved road surface and immediate shoulder right-of-way. FDOT supplied location data for open channels that it maintains along roadways. The area of the open channel was assigned a communication and transportation land use and assigned to FDOT. Any gaps between the buffered roadway width and the open channels were closed in GIS to make one continuous road width of FDOT jurisdiction matching the mapping that was done for divided roadways in the 2009 land use database. In the Orange Lake Watershed, land use data were adequately classified as transportation. In Marion County roadways were assigned to FDOT District 5 and in Alachua County to FDOT District 2.

Newnans and Orange Lakes were combined into one allocation database clipped from the larger Orange Creek Basin land use database for allocation purposes. Lochloosa Lake was separated into its own land use database because there was a difference in some of the aggregations of FLUCCS codes into model categories.

The allocated land use category was assigned to each polygon in the database, as listed in **Table A-1** for the Newnans Lake and Orange Lake Watersheds and in **Table A-2** for the Lochloosa Lake Watershed. The final Newnans Lake and Orange Lake data layer contains 28,717 individual polygons, each with a unique combination of land use, modeled and allocated land use category, jurisdiction, sub-basin, and impaired waterbody name. The final Lochloosa Lake database contains 9,690 individual polygons, each with a unique combination of land use, modeled and allocated land use category, jurisdiction, sub-basin, and impaired waterbody name.

Table A-1. Summary of land use aggregations for Newnans and Orange Lakes

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Agriculture	Agriculture	2100	0.01
Agriculture	Agriculture	2110	15,577.04
Agriculture	Agriculture	2120	622.99
Agriculture	Agriculture	2130	3,340.43
Agriculture	Agriculture	2140	260.39
Agriculture	Agriculture	2150	5,458.07
Agriculture	Agriculture	2153	104.19
Agriculture	Agriculture	2160	659.11
Agriculture	Agriculture	2200	325.69
Agriculture	Agriculture	2210	51.50
Agriculture	Agriculture	2230	3.27
Agriculture	Agriculture	2240	15.10
Agriculture	Agriculture	2310	34.57
Agriculture	Agriculture	2320	7.45
Agriculture	Agriculture	2400	5.51
Agriculture	Agriculture	2410	47.70

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Agriculture	Agriculture	2430	21.54
Agriculture	Agriculture	2500	103.75
Agriculture	Agriculture	2510	8,446.08
Agriculture	Agriculture	2610	36.88
Communication and Transportation	Communication and Transportation	1100	9.22
Communication and Transportation	Communication and Transportation	1180	13.90
Communication and Transportation	Communication and Transportation	1200	6.63
Communication and Transportation	Communication and Transportation	1300	1.01
Communication and Transportation	Communication and Transportation	1400	7.67
Communication and Transportation	Communication and Transportation	1550	3.60
Communication and Transportation	Communication and Transportation	1700	6.87
Communication and Transportation	Communication and Transportation	1840	0.01
Communication and Transportation	Communication and Transportation	1900	0.90
Communication and Transportation	Communication and Transportation	2110	4.36
Communication and Transportation	Communication and Transportation	2130	2.19
Communication and Transportation	Communication and Transportation	2150	0.78
Communication and Transportation	Communication and Transportation	2160	0.18
Communication and Transportation	Communication and Transportation	2200	2.04
Communication and Transportation	Communication and Transportation	3100	8.41
Communication and Transportation	Communication and Transportation	3200	1.12
Communication and Transportation	Communication and Transportation	3300	2.79
Communication and Transportation	Communication and Transportation	4110	3.60
Communication and Transportation	Communication and Transportation	4120	0.05
Communication and Transportation	Communication and Transportation	4340	10.73
Communication and Transportation	Communication and Transportation	4410	27.83
Communication and Transportation	Communication and Transportation	4430	3.20
Communication and Transportation	Communication and Transportation	5300	0.10
Communication and Transportation	Communication and Transportation	6170	14.33
Communication and Transportation	Communication and Transportation	6210	0.30
Communication and Transportation	Communication and Transportation	6250	0.50
Communication and Transportation	Communication and Transportation	6300	0.58
Communication and Transportation	Communication and Transportation	8110	952.09
Communication and Transportation	Communication and Transportation	8140	1,412.66
Communication and Transportation	Communication and Transportation	8200	14.51
Communication and Transportation	Communication and Transportation	8310	22.34
Communication and Transportation	Communication and Transportation	8320	165.29
Communication and Transportation	Communication and Transportation	8340	60.00
Communication and Transportation	Communication and Transportation	8350	20.67

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Communication and Transportation	Communication and Transportation	8370	34.89
Forest	Forest	4100	4.65
Forest	Forest	4110	5,614.55
Forest	Forest	4120	341.87
Forest	Forest	4200	411.98
Forest	Forest	4340	15,160.78
Forest	Forest	4410	27,092.25
Forest	Forest	4430	11,900.15
High-Density Residential	High-Density Residential	1300	390.43
High-Density Residential	High-Density Residential	1390	11.46
High-Density Residential	High-Density Residential	1400	1,077.88
High-Density Residential	High-Density Residential	1510	51.06
High-Density Residential	High-Density Residential	1520	27.29
High-Density Residential	High-Density Residential	1530	12.98
High-Density Residential	High-Density Residential	1550	457.64
Low-Density Residential	Low-Density Residential	1100	4,184.07
Low-Density Residential	Low-Density Residential	1110	0.74
Low-Density Residential	Low-Density Residential	1130	3.03
Low-Density Residential	Low-Density Residential	1180	6,469.63
Low-Density Residential	Low-Density Residential	1480	47.68
Low-Density Residential	Low-Density Residential	1600	9.41
Low-Density Residential	Low-Density Residential	1620	86.89
Low-Density Residential	Low-Density Residential	1632	421.85
Low-Density Residential	Low-Density Residential	1650	405.44
Low-Density Residential	Low-Density Residential	1660	21.88
Low-Density Residential	Low-Density Residential	1670	17.84
Low-Density Residential	Low-Density Residential	1700	1,492.41
Medium-Density Residential	Medium-Density Residential	1200	2,110.54
Rangeland	Rangeland	3100	809.45
Rangeland	Rangeland	3200	436.21
Rangeland	Rangeland	3300	1,854.31
Rural Open	Rural Open	7400	48.09
Rural Open	Rural Open	7410	155.25
Rural Open	Rural Open	7420	1.73
Urban Open	Urban Open	1820	147.56
Urban Open	Urban Open	1830	280.84
Urban Open	Urban Open	1840	19.75
Urban Open	Urban Open	1850	222.35

Allocated Land Use	Modeled Land Use	FLUCCS	Total Acres
Urban Open	Urban Open	1860	157.01
Urban Open	Urban Open	1890	186.12
Urban Open	Urban Open	1900	54.73
Urban Open	Urban Open	1920	71.40
Water and Wetland	Water and Wetland	5100	11.62
Water and Wetland	Water and Wetland	5200	11,451.81
Water and Wetland	Water and Wetland	5250	389.68
Water and Wetland	Water and Wetland	5300	178.89
Water and Wetland	Water and Wetland	6110	261.71
Water and Wetland	Water and Wetland	6130	10.02
Water and Wetland	Water and Wetland	6170	10,273.80
Water and Wetland	Water and Wetland	6181	24.85
Water and Wetland	Water and Wetland	6210	3,978.40
Water and Wetland	Water and Wetland	6250	2,244.25
Water and Wetland	Water and Wetland	6300	2,852.93
Water and Wetland	Water and Wetland	6410	6,909.91
Water and Wetland	Water and Wetland	6430	1,253.02
Water and Wetland	Water and Wetland	6440	1,603.16
Water and Wetland	Water and Wetland	6460	5,371.15

Table A-2. Summary of land use aggregations for the Lochloosa Lake Watershed

Allocated Land Use	HSPF Modeled Land Use	FLUCCS	Total Acres
Agriculture	Agriculture General	2140	146.2
Agriculture	Agriculture General	2150	934.4
Agriculture	Agriculture General	2160	4.2
Agriculture	Agriculture General	2310	13
Agriculture	Agriculture General	2410	9.5
Agriculture	Agriculture General	2430	37.6
Agriculture	Agriculture General	2500	6.5
Agriculture	Agriculture General	2520	32.3
Agriculture	Agriculture General	2610	71.6
Pasture	Pasture	2110	2,782.5
Pasture	Pasture	2120	256.2
Pasture	Pasture	2130	593.8
Tree Crops	Agriculture Tree Crops	2200	739.3
Communication and Transportation	Communication and Transportation	1100	0.61
Communication and Transportation	Communication and Transportation	1400	0.47
Communication and Transportation	Communication and Transportation	2150	3.42
Communication and Transportation	Communication and Transportation	2200	3.56
Communication and Transportation	Communication and Transportation	2500	0.77
Communication and Transportation	Communication and Transportation	4110	1.66
Communication and Transportation	Communication and Transportation	4340	2.16
Communication and Transportation	Communication and Transportation	4410	31.03
Communication and Transportation	Communication and Transportation	6170	1.22
Communication and Transportation	Communication and Transportation	6210	0.01
Communication and Transportation	Communication and Transportation	6300	0.33
Communication and Transportation	Communication and Transportation	6460	4.95
Communication and Transportation	Communication and Transportation	7410	0.59
Communication and Transportation	Communication and Transportation	8140	544.91
Communication and Transportation	Communication and Transportation	8200	0.07
Forest	Forest	4110	927.91
Forest	Forest	4200	50.98
Forest	Forest	4340	3,144.63
Forest	Forest	4410	17,691.87
Forest	Forest Regeneration	4430	6,186.66
High-Density Residential	High-Density Residential	1300	18.41
High-Density Residential	High-Density Residential	1390	12.66
Industrial and Commercial	Industrial and Commercial	1400	106.77
Industrial and Commercial	Industrial and Commercial	1480	18.54
Industrial and Commercial	Industrial and Commercial	1490	2.63
Industrial and Commercial	Industrial and Commercial	1510	6.23
Industrial and Commercial	Industrial and Commercial	1550	36.82

Allocated Land Use	HSPF Modeled Land Use	FLUCCS	Total Acres
Industrial and Commercial	Industrial and Commercial	1700	81.54
Industrial and Commercial	Industrial and Commercial	1840	4.70
Industrial and Commercial	Industrial and Commercial	8310	2.79
Low-Density Residential	Low-Density Residential	1100	996.77
Low-Density Residential	Low-Density Residential	1180	1,382.11
Medium-Density Residential	Medium-Density Residential	1200	217.21
Mining	Mining	7420	2.95
Open Land and Barren Land	Open Land and Barren Land	1850	2.34
Open Land and Barren Land	Open Land and Barren Land	1860	35.38
Open Land and Barren Land	Open Land and Barren Land	1900	18.54
Open Land and Barren Land	Open Land and Barren Land	1920	39.70
Open Land and Barren Land	Open Land and Barren Land	7410	44.76
Open Land and Barren Land	Open Land and Barren Land	8200	6.37
Open Land and Barren Land	Open Land and Barren Land	8320	3.43
Rangeland	Rangeland	3100	129.00
Rangeland	Rangeland	3200	199.61
Rangeland	Rangeland	3300	293.16
Water/Wetlands	Water	5100	11.75
Water/Wetlands	Water	5200	5,637.49
Water/Wetlands	Water	5300	28.70
Water/Wetlands	Water	8370	0.90
Water/Wetlands	Wetlands	6110	107.01
Water/Wetlands	Wetlands	6170	3,109.89
Water/Wetlands	Wetlands	6210	2,017.85
Water/Wetlands	Wetlands	6250	1,060.42
Water/Wetlands	Wetlands	6300	1,805.31
Water/Wetlands	Wetlands	6410	2,503.39
Water/Wetlands	Wetlands	6430	227.45
Water/Wetlands	Wetlands	6440	289.54
Water/Wetlands	Wetlands	6460	1,941.54

Septic System Buffer Delineation

Septic system contributions, when included in watershed loading estimates, represent septic systems located within 200 meters of the waterbody shoreline, tributaries, or other connected drainage pathways discharging to the waterbody. Locating septic systems within 200 meters of waterbodies required the creation of a data layer that identified a 200-meter buffer around the lakes and defined the connected drainage pathways into the lakes. The 2016 Florida National Hydrography Dataset (NHD) classifies hydrographic features by the type of waterbody. Both 1:100,000 scale and 1:24,000 scale NHD maps were used to identify lake areas, flow paths, and connected drainage pathways. Wetlands were included where they were part of the lake's littoral

zone or within a connected drainage pathway (streams/canals enter or exit). Isolated lakes or ponds, streams or canals, wetlands, and expected internal drainage areas were not included.

Streams and canals were mapped at a1:24,000 scale from the NHD 24 layer using the NHD Flowline and NHD Area data layers. This scale provided the best resolution of detail needed for mapping of these types of waterbodies within the basin. The NHD dataset includes predicted flow paths for streams and provides connectivity between the streams, lakes, and wetlands. It is not uncommon for streams to enter and exit wetlands to continue their flow paths and that was accounted for in the delineation of flow paths.

Large wetland systems beyond the littoral zone of individual lakes are present in the basin. Wetlands were mapped at scale of 1:100,000 which eliminated the inclusion of small isolated wetland systems.

Lakes were mapped at the 1:100,000 scale including their connected wetland littoral zones. Lake areas and wetlands were identified from the NHD 100 waterbody data layer. Wetlands and lake areas were merged and boundaries between them dissolved before the buffer was calculated.

The buffer is delineated as 200 meters on each side of flowlines (streams) and 200 meters from the outside edge of wetlands. The lake areas for Newnans, Orange, and Lochloosa were included in the wetland buffer. Wetland and lake areas that were determined to not be connected to the Newnans Lake, Orange Lake, or Lochloosa Lake lake-wetland buffer layer or any of the stream buffers were removed from inclusion for OSTDS mapping.

Loading Comparison

To evaluate the effect of more recent land use data on estimates of watershed loadings, TN and TP loadings were calculated for Newnans and Orange Lakes' 2009 land use using a spreadsheet version of the WMM that was used for TMDL development. The same rainfall amounts, EMC values, and runoff coefficients were used for the 2009 land use data loading estimates as for the TMDL estimates. The results are compared with 1995 land use loading estimates (**Tables A-3** and **A-4**) calculated with the same spreadsheet version of the WMM.

Table A-3. Loading comparison for Newnans Lake

TP (lbs/yr)	Newnans Lake 2009 Land Use	Newnans Lake TMDL Land Use	Hatchet Creek 2009 Land Use	Hatchet Creek TMDL Land Use	Little Hatchet Creek 2009 Land Use	Little Hatchet Creek TMDL Land Use
1996	4,926	5,033	9,256	9,017	3,258	2,754
1997	5,725	5,849	10,756	10,479	3,786	3,200
1998	2,907	2,970	5,462	5,321	1,923	1,625
1999	1,279	1,307	2,403	2,341	846	715
2000	396	404	744	725	262	221
TN lbs/yr						
1996	42,111	41,976	64,662	62,319	24,061	20,036
1997	48,935	48,778	75,140	72,418	27,960	23,283
1998	24,850	24,770	38,157	36,775	14,198	11,824
1999	10,934	10,899	16,789	16,181	6,247	5,202
2000	3,383	3373	5,195	5,007	1,933	1,610

Table A-4. Loading comparison for Orange Lake

TP (lbs/yr)	Orange Lake 2009 Land Use	Orange Lake TMDL Land Use	Camps Canal 2009 Land Use	Camps Canal TMDL Land Use
1995	12,044	11,370	1,607	1,529
1996	12,078	11,402	1,611	1,533
1997	18,076	17,064	2,412	2,294
1998	9,369	8,845	1,250	1,189
1999	8,018	7,569	1,070	1,018
2000	648	612	87	82
TN lbs/yr				
1995	88,307	85,482	15,323	15,312
1996	88,555	85,722	15,366	15,355
1997	132,535	128,295	22,998	22,980
1998	68,694	66,497	11,920	11,911
1999	58,789	56,908	10,201	10,193
2000	4,755	4,603	825	824

Appendix B: Nutrient Budgets by Watershed

Individual waterbody nutrient budgets for Newnans Lake, Orange Lake, and Lochloosa Lake were created to provide baseline loading estimates on which to base allocations. The budgets for these lakes 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 budget for Lochloosa Lake starts with the attenuated loading for each sub-basin in the watershed.

The updated nutrient budgets displayed for Alachua Sink and Lake Wauberg include credits for agricultural BMPs implemented through July 31, 2018, and water quality improvement projects implemented through December 31, 2017. Tables 16a through 16e and Tables 18a through 18e in Gao et al. (2006) were used to estimate land use loadings from the watershed. Table 47 in the same document provided the summary of current loading information.

Some attenuation was assumed when the loading from Alachua Lake was modeled as an input into Alachua Sink, resulting in watershed-independent estimates of TN loading being somewhat larger than the modeled current conditions loading. 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 by entity.

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

Note: Stormwater loading from forest land was set aside and not included as part of allocated loading.

Sources of TP	TMDL Baseline Loading	% of TMDL Baseline Loading	TMDL Baseline Loading without Forest and Point Source	Controllable TMDL Baseline Loading	Controllable TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Point Sources	386	1.48					
Brittany Estates Mobile Home Park	386	1.48					
Stormwater Runoff Forest Newnans Lake	338	1.30					
Stormwater Runoff Undeveloped Land Uses Newnans Lake	1,538	5.90	1,538	0			1,538
Rangeland	98	0.37	98	0			98
Water/Wetland	1,440	5.52	1,440	0			1,440
Stormwater Runoff from Developed Uses Newnans Lake	460	1.76	460	460	2.97	386	460
Urban Open	34	0.13	34	34	0.22	29	34
Low-Density Residential	149	0.57	149	149	0.96	125	149
Medium-Density Residential	210	0.81	210	210	1.36	176	210
High-Density Residential	31	0.12	31	31	0.20	26	31
Transportation and Communication	35	0.14	35	35	0.23	30	35
Rural Open	0	0.0	0	0			
Agriculture Newnans Lake	215	0.82	215	215	1.39	180	215
Groundwater Seepage Newnans Lake	556	2.13	556				556
Septic Systems Newnans Lake	111	0.43	111	111	0.72	93	111
Stormwater Runoff Forest Hatchet Creek	1,137	4.36					
Stormwater Runoff Undeveloped Land Uses Hatchet Creek	1,394	5.35	1,394	0			1,394
Rangeland	98	0.38	98	0			98
Water/Wetland	1,296	4.97	1,296	0			1,296
Stormwater Runoff from Developed Uses Hatchet Creek	422	1.62	422	422	2.72	354	422
Urban Open	33	0.13	33	33	0.21	27	33
Low-Density Residential	228	0.88	228	228	1.47	192	228
Medium-Density Residential	76	0.29	76	76	0.49	64	76

Sources of TP	TMDL Baseline Loading	% of TMDL Baseline Loading	TMDL Baseline Loading without Forest and Point Source	Controllable TMDL Baseline Loading	Controllable TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
High-Density Residential	10	0.04	10	10	0.06	8	10
Transportation and Communication	71	0.27	71	71	0.46	60	71
Rural Open	4	0.02	4	4	0.03	3	
Agriculture Hatchet Creek	283	1.09	283	283	1.83	237	283
Septic Systems Hatchet Creek	142	0.55	142	142	0.92	119	142
Groundwater Seepage Hatchet Creek	1,005	3.85	1,005	0			1,005
Stormwater Runoff Forest Little Hatchet Creek	292	1.12					
Stormwater Runoff Undeveloped Land Uses Little Hatchet Creek	440	1.69	440	0			440
Rangeland	107	0.41	107	0			107
Water/Wetland	333	1.28	333	0			333
Stormwater Runoff from Developed Uses Little Hatchet Creek	364	1.40	364	364	2.35	305	364
Urban Open	44	0.17	44	44	0.28	37	44
Low-Density Residential	12	0.05	12	12	0.08	10	12
Medium-Density Residential	93	0.36	93	93	0.60	78	93
High-Density Residential	29	0.11	29	29	0.19	25	29
Transportation and Communication	186	0.71	186	186	1.20	156	186
Rural Open	0	0.00	0	0	0.00	0	
Agriculture Little Hatchet Creek	24	0.09	24	24	0.15	20	24
Septic Systems Little Hatchet Creek	3	0.01	3	3	0.02	2	3
Groundwater Seepage Little Hatchet Creek	267	1.02	267	0			267
Internal Nutrient Recycling	13,478	51.69	13,478	13,478	86.94	11,302	13,478
Atmospheric Deposition (Wet/Dry)	3,223	12.36	3,223	0			3,223
TP Loading Information							
TMDL Baseline TP Loading and % (lbs/yr)	**26,076**	**100.00**	**23,923**	**15,502**	**100.00**	**12,999**	**23,923**
TMDL (lbs/yr)	**10,924**		**10,924**				**10,924**
Reduction Needed in Loading (lbs/yr)	**15,152**		**12,999**				**12,999**

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Table B-1b. Newnans Lake TN budget (lbs-TN/yr)

Note: Stormwater loading from forest land was set aside and not included as part of allocated loading.

Sources of TN	TMDL Baseline Loading	% of TMDL Baseline Loading	TMDL Baseline Loading without Forest and Point Source	Controllable TMDL Baseline Loading	Controllable TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Point Sources	3,104	0.97					
WWTP Discharges							
Brittany Estates Mobile Home Park	3,104	0.97					
Stormwater Runoff Forest Newnans Lake	5,457	1.71					
Stormwater Runoff Undeveloped Land Uses Newnans Lake	15,028	4.70	15,028	0			15,028
Rangeland	672	0.21	672	0			672
Water/Wetland	14,356	4.49	14,356	0			14,356
Stormwater Runoff from Developed Uses Newnans Lake	3,991	1.25	3,991	3,991	1.64	3,332	3,991
Urban Open	355	0.11	355	355	0.15	297	355
Low-Density Residential	1,370	0.43	1,370	1,370	0.56	1,144	1,370
Medium-Density Residential	1,741	0.54	1,741	1,741	0.72	1,453	1,741
High-Density Residential	205	0.06	205	205	0.08	171	205
Transportation and Communication	320	0.10	320	320	0.13	267	320
Rural Open	0	0.00	0	0	0.00	0	0
Agriculture Newnans Lake	1,483	0.46	1,483	1,483	0.61	1,238	1,483
Groundwater Seepage Newnans Lake	2,038	0.64	2,038	0			2,038
Septic Systems Newnans Lake	818	0.26	818	818	0.34	683	818
Stormwater Runoff Forest Hatchet Creek	18,925	5.92					
Stormwater Runoff Undeveloped Land Uses Hatchet Creek	13,639	4.26	13,639	0			13,639
Rangeland	680	0.21	680	0			680
Water/Wetland	12,959	4.05	12,959	0			12,959
Stormwater Runoff from Developed Uses Hatchet Creek	3,848	1.20	3,848	3,848	1.58	3,213	3,848
Urban Open	340	0.11	340	340	0.14	284	340

Sources of TN	TMDL Baseline Loading	% of TMDL Baseline Loading	TMDL Baseline Loading without Forest and Point Source	Controllable TMDL Baseline Loading	Controllable TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Low-Density Residential	2,094	0.65	2,094	2,094	0.86	1,749	2,094
Medium-Density Residential	629	0.20	629	629	0.26	525	629
High-Density Residential	63	0.02	63	63	0.03	52	63
Transportation and Communication	651	0.20	651	651	0.27	544	651
Rural Open	71	0.02	71	71	0.03	59	71
Agriculture Hatchet Creek	1,954	0.61	1,954	1,954	0.80	1,631	1,954
Groundwater Seepage Hatchet Creek	3,683	1.15	3,683	0			3,683
Septic Systems Hatchet Creek	1,042	0.33	1,042	1,042	0.43	870	1,042
Stormwater Runoff Forest Little Hatchet Creek	3,861	1.21					
Stormwater Runoff Undeveloped Land Uses Little Hatchet Creek	3,518	1.10	3,518	0			3,518
Rangeland	641	0.20	641	0			641
Water/Wetland	2,877	0.90	2,877	0			2,877
Stormwater Runoff from Developed Uses Little Hatchet Creek	3,378	1.06	3,378	3,378	1.39	2,820	3,378
Urban Open	394	0.12	394	394	0.16	329	394
Low-Density Residential	95	0.03	95	95	0.04	79	95
Medium-Density Residential	668	0.21	668	668	0.27	558	668
High-Density Residential	166	0.05	166	166	0.07	139	166
Transportation and Communication		0.64	2,052	2,052	0.84	1,713	2,052
Rural Open	3	0.14	3	3	0.00	3	3
Agriculture Little Hatchet Creek	143	0.04	143	143	0.06	120	143
Groundwater Seepage Little Hatchet Creek	978	0.31	978	0			978
Septic Systems Little Hatchet Creek	10	0.00	10	10	0.00	8	10
Internal Nutrient Recycling	226,527	70.82	226,527	226,527	93.15	189,137	226,527
Atmospheric Deposition (Wet/Dry)	6,446	2.02	6,446	0			6,446
TN Loading Information							
TMDL Baseline TN Loading and % (lbs/yr)	319,869	**100.00**	**288,523**	**243,194**	**100.00**	**203,053**	**288,523**
TMDL (lbs/yr)	85,470		**85,470**				**85,470**

Sources of TN	TMDL Baseline Loading	% of TMDL Baseline Loading	TMDL Baseline Loading without Forest and Point Source	Controllable TMDL Baseline Loading	Controllable TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Reduction Needed in Loading (lbs/yr)	234,399		**203,053**				**203,053**

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

Note: Stormwater loading from forest land was set aside and not included as part of allocated loading.
CCRS = Camps Canal and River Styx

Sources of TP	TMDL Baseline Loading	% of TMDL Baseline Loading	TMDL Baseline Loading without Forest	Controllable TMDL Baseline Loading	Controllable TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Stormwater Runoff Forest Orange Lake	351	1.26					
Stormwater Runoff Undeveloped Land Use Orange Lake	2,574	9.23	2,574	0			2,574
Rangeland	19	0.07	19	0			19
Water/Wetland	2,555	9.16	2,555	0			2,555
Stormwater Runoff from Developed Uses Orange Lake	893	3.20	893	893	4.25	512	893
Urban Open	94	0.34	94	94	0.45	54	94
Low-Density Residential	418	1.50	418	418	1.99	240	418
Medium-Density Residential	168	0.60	168	168	0.80	96	168
High-Density Residential	4	0.01	4	4	0.02	2	4
Rural Open	7	0.03	7	7	0.03	4	7
Transportation and Communication	202	0.72	202	202	0.96	116	202
Agriculture Orange Lake	5,712	20.48	5,712	5,712	27.21	3,274	5,712
Septic Systems Orange Lake	384	1.38	384	384	1.83	220	384
Stormwater Runoff Forest CCRS	243	0.87					
Stormwater Runoff Undeveloped Land Use CCRS	789	2.82	789	0			789
Rangeland	5	0.02	5	0			5
Water/Wetland	784	2.81	784	0			784
Stormwater Runoff from Developed Uses CCRS	52	0.19	52	52	0.25	30	52
Urban Open	3	0.01	3	3	0.01	1	3
Low-Density Residential	24	0.09	24	24	0.11	14	24
Medium-Density Residential	18	0.06	18	18	0..09	10	18
High-Density Residential	0	0.0	0	0	0.00	0	0
Rural Open	0	0.00	0	0	0.00	0	0
Transportation and Communication	8	0.03	8	8	0.04	4	8
Septic Systems CCRS	6	0.02	6	6	0.03	4	6
Agriculture CCRS	274	0.98	274	274	1.31	157	274
Atmospheric Deposition (Wet/Dry)	2,941	10.54	2,941	0			2,941

Sources of TP	TMDL Baseline Loading	% of TMDL Baseline Loading	TMDL Baseline Loading without Forest	Controllable TMDL Baseline Loading	Controllable TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Tributary Inflows	13,671	49.02	13,671	13671	65.12	7,837	13,671
Camps Canal (Newnans Lake)	10,344	37.09	10,344	10,344	49.27	5,930	10,344
Cross Creek (Lochloosa Lake)	3,327	11.93	3,327	3,327	15.85	1,907	3,327
Seepage/Groundwater	0		0	0		0	0
Internal Nutrient Recycling	0		0	0		0	0
Loading Information							
TMDL Baseline TP Loading and % (lbs/yr)	**27,890**	**100.00**	**27,296**	**20,993**	**100.00**	**12,034**	**27,296**
TMDL (lbs/yr)	**15,262**		**15,262**				**15,262**
Reduction Needed in Loading (lbs/yr)	**12,628**		**12,034**				**12,034**

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

Note: Stormwater loading from forest land was set aside and not included as part of allocated loading.

Sources of TP	Attenuated TMDL Baseline Loading	% of TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Stormwater Runoff Forest/Forest Regeneration Segment 16	18.1	0.11					
Stormwater Runoff Undeveloped Land Use Segment 16	10.5	0.06	10.5				10.5
Rangeland	0	0.0	0				0
Water/wetland	10.5	0.06	10.5				10.5
Stormwater Runoff from Developed Uses Segment 16	44.1	0.26	44.1	44.1	0.46	23.5	44.1
Low-Density Residential	44.1	0.26	44.1	44.1	0.46	23.5	44.1
Agriculture Segment 16	8.0	0.05	8.0	8.0	0.08	4.3	8.0
Pasture	6.4	0.04	6.4	6.4	0.06	3,4	6.4
Tree Crops	1.6	0.01	1.6	1.6	0.02	0.9	1.6
Stormwater Runoff Forest/Forest Regeneration Segment 17	60.5	0.36					
Stormwater Runoff Undeveloped Land Use Segment 17	52.5	0.32	52.5				52.5
Rangeland	12.8	0.08	12.8				12.8
Water/Wetland	39.6	0.24	39.6				39.6
Stormwater Runoff from Developed Uses Segment 17	35	0.21	35	35	0.37	18.6	35.0
Open Land and Barren Land	0.1	0.0	0.1	0.1	0.00	0.1	0.1
Low-Density Residential	20.3	0.12	20.3	20.3	0.21	10.8	20.3
Transportation and Communication	14.5	0.0.09	14.5	14.5	0.16	7.7	14.5
Agriculture Segment 17	243.9	1.43	243.9	243.9	2.54	130.1	243.9
Crops	45.0	0..27	45.0	45.0	0.47	24.0	45.0
Pasture	151.6	0.9	151.6	151.6	1.58	80.8	151.6
Tree Crops	47.2	0.28	47.2	47.2	0.49	25.2	47.2
Stormwater Runoff Forest/Forest Regeneration Segment 18	135.2	0.81					

Sources of TP	Attenuated TMDL Baseline Loading	% of TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Stormwater Runoff Undeveloped Land Use Segment 18	104.7	0.63	104.7				104.7
Rangeland	6.6	0.04	6.6				6.6
Water/Wetland	98.1	0.59	98.1				98.1
Stormwater Runoff from Developed Uses Segment 18	108.2	0.65	108.2	108.2	1.13	57.7	108.2
Low-Density Residential	44.9	0.3	44.9	44.9	0.47	23.9	44.9
Industrial and Commercial	8.7	0.1	8.7	8.7	0.09	4.7	8.7
Transportation and Communication	54.6	0.3	54.6	54.6	0.57	29.1	54.6
Agriculture Segment 18	413.4	2.47	413.4	413.4	4.30	220.5	413.4
Crops	98.5	0.6	98.5	98.5	1.03	52.5	98.5
Pasture	262.6	1.6	262.6	262.6	2.73	140.0	262.6
Tree Crops	52.3	0.3	52.3	52.3	0.54	27.9	52.3
Stormwater Runoff Forest/Forest Regeneration Segment 19	362.7	2.2					
Stormwater Runoff Undeveloped Land Use Segment 19	274.7	1.64	274.7	0			274.7
Rangeland	12.9	0.1	12.9	0			12.9
Water/Wetland	261.8	1.6	261.8	0			261.8
Stormwater Runoff from Developed Uses Segment 19	174.7	1.04	174.7	174.7	1.82%	93.2	174.7
Open Land and Barren Land	2.0	0.01%	2.0	2.0	0.02%	1.1	2.0
Low-Density Residential	25.4	0.15%	25.4	25.4	0.26%	13.6	25.4
Industrial and Commercial	34.5	0.21%	34.5	34.5	0.36%	18.4	34.5
Medium-Density residential	1.7	0.01%	1.7	1.7	0.02%	0.9	1.7
Transportation and Communication	111.1	0.66%	111.1	111.1	1.16%	59.2	111.1
Agriculture Segment 19	521.1	3.11%	521.1	521.1	5.43%	277.9	521.1
Crops	99.7	0.60%	99.7	99.7	1.04%	53.2	99.7
Pasture	283.0	1.69%	283.0	283.0	2.95%	150.9	283.0
Tree Crops	138.4	0.83%	138.4	138.4	1.44%	73.8	138.4
Stormwater Runoff Forest/Forest Regeneration	42.7	0.25					

Sources of TP	Attenuated TMDL Baseline Loading	% of TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Segment 20							
Stormwater Runoff Undeveloped Land Use Segment 20	44.8	0.27	44.8	0			44.8
Rangeland	1.8	0.01	1.8				1.8
Water/Wetland	43.0	0.26	43.0				43.0
Stormwater Runoff from Developed Uses Segment 20	50.6	0.30	50.6	50.6	0.53	27.0	50.6
Open Land and Barren Land	1.9	0.01	1.9	1.9	0.02	1.0	1.9
Low-Density Residential	15.9	0.10	15.9	15.9	0.17	8.5	15.9
Industrial and Commercial	3.3	0.02	3.3	3.3	0.03	1.8	3.3
Transportation and Communication	29.4	0.18	29.4	29.4	0.31	15.7	29.4
Agriculture Segment 20	106.4	0.64	106.4	106.4	1.11	56.7	106.4
Crops	24.8	0.15	24.8	24.8	0.26	13.2	24.8
Pasture	79.8	0.48	79.8	79.8	0.83	42.6	79.8
Tree Crops	1.8	0.01	1.8	1.8	0.02	1.0	1.8
Stormwater Runoff Forest/Forest Regeneration Segment 21	185.5	1.11					
Stormwater Runoff Undeveloped Land Use Segment 21	210.0	1.25	210.0				210.0
Rangeland	48.6	0.29	48.6				48.6
Water/Wetland	161.5	0.96	161.5				161.5
Stormwater Runoff from Developed Uses Segment 21	145.6	0.87	145.6	145.6	1.52	77.7	145.6
Open Land and Barren Land	1.3	0.01	1.3	1.3	0.01	0.7	1.3
Low-Density Residential	68.0	0.41	68.0	68.0	0.71	36.3	68.0
Transportation and Communication	75.2	0.45	75.2	75.2	0.78	40.1	75.2
Mining	1.1	0.01	1.1	1.1	0.01	0.6	1.1
Agriculture Segment 21	432.2	2.58	432.2	432.2	4.50	230.5	432.2
Crops	5.7	0.03	5.7	5.7	0.06	3	5.7

Sources of TP	Attenuated TMDL Baseline Loading	% of TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Pasture	426.5	2.55	426.5	426.5	4.44	227	426.5
Stormwater Runoff Forest/Forest Regeneration Segment 22	77.9	0.46					
Stormwater Runoff Undeveloped Land Use Segment 22	46.0	0.27	46.0				46.0
Water/Wetland	46.0	0.27	46.0				46.0
Stormwater Runoff Forest/Forest Regeneration Segment 23	203.6	1.22					
Stormwater Runoff Undeveloped Land Use Segment 23	103.2	0.62	103.2				103.2
Rangeland	7.2	0.04	7.2				7.2
Water/Wetland	95.9	0.57	95.9				95.9
Stormwater Runoff from Developed Uses Segment 23	410.9	2.45	410.9	410.9	4.28	219.2	410.9
Open Land and Barren Land	4.7	0.03	4.7	4.7	0.05	2.5	4.7
Low-Density Residential	59.7	0.36	59.7	59.7	0.62	31.8	59.7
Industrial and Commercial	192.1	1.15	192.1	192.1	2.00	102.5	192.1
Transportation and Communication	83.9	0.50	83.9	83.9	0.87	44.8	83.9
Medium-Density Residential	48.4	0.29	48.4	48.4	0.50	25.8	48.4
High-Density Residential	22.1	0.13	22.1	22.1	0.23	11.8	22.1
Agriculture Segment 23	197.3	1.18	197.3	197.3	2.05	105.2	197.3
Crops	138.1	0.82	138.1	138.1	1.44	73.7	138.1
Pasture	59.1	0.35	59.1	59.1	0.62	31.5	59.1
Tree Crops	0.1	0.00	0.1	0.1	0.00	0.0	0.1
Stormwater Runoff Forest/Forest Regeneration Segment 24	64.6	0.39					
Stormwater Runoff Undeveloped Land Use Segment 24	66.9	0.40	66.9				66.9
Rangeland	1.1	0.01	1.1				1.1
Water/Wetland	65.7	0.39	65.7				65.7

Sources of TP	Attenuated TMDL Baseline Loading	% of TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Stormwater Runoff from Developed Uses Segment 24	291.2	1.74	291.2	291.2	3.03	155.3	291.2
Low-Density Residential	241.0	1.44	241.0	241.0	2.51	128.5	241.0
Transportation and Communication	50.2	0.30	50.2	50.2	0.52	26.8	50.2
Agriculture Segment 24	103.7	0.62	103.7	103.7	1.08	55.3	103.7
Crops	5.0	0.03	5.0	5.0	0.05	2.7	5.0
Pasture	98.7	0.59	98.7	98.7	1.03	52.6	98.7
Stormwater Runoff Forest/Forest Regeneration Segment 25	41.9	0.25					42
Stormwater Runoff Undeveloped Land Use Segment 25	43.50	0.26	43.5				43.5
Rangeland	0	0.0	0				0
Water/Wetland	43.5	0.26	43.5				43.5
Stormwater Runoff from Developed Uses Segment 25	32.2	0.19	32.2	32.2	0.34	17.2	32.2
Low-Density Residential	7.1	0.04	7.1	7.1	0.07	3.8	7.1
Transportation and Communication	25.1	0.15	25.1	25.1	0.26	13.4	25.1
Agriculture Segment 25	44.9	0.27	44.9	44.9	0.47	23.9	44.9
Pasture	44.9	0.27	44.9	44.9	0.47	23.9	44.9
Stormwater Runoff Forest/Forest Regeneration Segment 26	114.6	0.68					
Stormwater Runoff Undeveloped Land Use Segment 26	74.7	0.45	74.7				74.7
Rangeland	2.9	0.02	3				2.9
Water/Wetland	71.8	0.43	72				71.8
Stormwater Runoff from Developed Uses Segment 26	0.5	0.00	0.5	0.5	0.01	0.3	0.5
Low-Density Residential	0.5	0.00	0.5	0.5	0.01	0.3	0.5
Agriculture Segment 26	34.2	0.20	34.2	34.2	0.36	18.3	34.2
Pasture	34.2	0.20	34.2	34.2	0.36	18.3	34.2
Stormwater Runoff Forest/Forest Regeneration Segment 27	390.9	2.33					

Sources of TP	Attenuated TMDL Baseline Loading	% of TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TP Load
Stormwater Runoff Undeveloped Land Use Segment 27	171.3	1.02	171.3				171.3
Rangeland	4.1	0.02	4.1				4.1
Water/Wetland	167.1	1.00	167.1				167.1
Stormwater Runoff from Developed Uses Segment 27	374.0	2.23	374.0	374.0	3.89	199.5	374.0
Open Land and Barren Land	0.5	0.00	0.5	0.5	0.01	0.3	0.5
Low-Density Residential	114.9	0.69	114.9	114.9	1.20	61.3	114.9
Industrial and Commercial	35.4	0.21	35.4	35.4	0.37	18.9	35.4
Transportation and Communication	158.6	0.95	158.6	158.6	1.65	84.6	158.6
Medium-Density Residential	64.5	0.38	64.5	64.5	0.67	34.3	64.5
Agriculture Segment 27	405.4	2.42	405.4	405.4	4.22	216.2	405.4
Crops	8.7	0.05	8.7	8.7	0.09	4.6	8.7
Pasture	396.5	2.37	396.5	396.5	4.13	211.5	396.5
Tree Crops	0.2	0.00	0.2	0.2	0.00	0.1	0.2
Atmospheric Deposition	4,248	25.36	4,248				4,248
Internal Loading	5,426	32.39	5,426	5,426	56.50	2,894	5,426
TP Loading Information							
TMDL Baseline TP Loading and % (lbs/yr)	**16,752**	**100.00**	**15,054**	**9,603**	**100.00**	**5,122**	**15,054**
TMDL (lbs/yr)	**9,932**		**9,932**				**9,932**
Reduction Needed in Loading (lbs/yr)	**6,820**		**5,122**				**5,122**

Table B-3b. Lochloosa Lake TN budget (lbs-TN/yr)

Note: Stormwater loading from forest land was set aside and not included as part of allocated loading.

Sources of TN	Attenuated TMDL Baseline Loading	% of Attenuated TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Stormwater Runoff Forest/Forest Regeneration Segment 16	307.8	0.07					
Stormwater Runoff Undeveloped Land Use Segment 16	219.5	0.05	219.5				219.5
Rangeland	0.2	0.00	0.2				0.2
Water/Wetland	219.3	0.05	219.3				219.3
Stormwater Runoff from Developed Uses Segment 16	350.9	0.08	350.9	350.9	0.12	254.9	350.9
Low-Density Residential	350.9	0.08	350.9	350.9	0.12	254.9	350.9
Agriculture Segment 16	65.7	0.02	65.7	65.7	0.02	47.7	65.7
Tree Crops	15.6	0.00	15.6	15.6	0.01	11,3	15.6
Pasture	50.1	0.01	50.1	50.1	0.02	36.4	50.1
Stormwater Runoff Forest/Forest Regeneration Segment 17	1,010.6	0.24					
Stormwater Runoff Undeveloped Land Use Segment 17	861.9	0.20	861.9				861.9
Rangeland	215.5	0.05	215.5				215.5
Water/Wetland	646.4	0.15	646.4				646.4
Stormwater Runoff from Developed Uses Segment 17	350.7	0.08	350.7	350.7	0.11	255.9	350.7
Open Land and Barren Land	1.8	0.00	1.8	1.8	0.00	1.3	1.8
Low-Density Residential	200.7	0.05	200.7	200.7	0.07	146.4	200.7
Transportation and Communication	148.3	0.04	148.3	148.3	0.05	108.2	148.3
Agriculture Segment 17	2,547.3	0.61	2547.3	2,547.3	0.83	1,858.9	2,547.3
Crops	478.8	0.11	478.8	478.8	0.16	349.4	478.9
Pasture	1,569.2	0.37	1,569.2	1,569.2	0.51	1,145.2	1,569.2
Tree Crops	499.3	0.12	499.3	499.3	0.16	364.3	499.3
Stormwater Runoff Forest/Forest Regeneration Segment 18	2,186.8	0.53					

Sources of TN	Attenuated TMDL Baseline Loading	% of Attenuated TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Stormwater Runoff Undeveloped Land Use Segment 18	1,676.6	0.4	1,676.6				1,676.6
Rangeland	109.5	0.03	109.5				109.5
Water/Wetland	1,567.2	0.38	1,567.2				1,567.2
Stormwater Runoff from Developed Uses Segment 18	1,074.5	0.26	1,074.5	1,074.5	0.36	780.0	1,074.5
Low-Density Residential	427.3	0.10	427.3	427.3	0.14	310.2	427.3
Industrial and Commercial	89.2	0.02	89.2	89.2	0.03	64.7	89.2
Transportation and Communication	558.0	0.13	558.0	558.0	0.18	405.1	558.0
Agriculture Segment 18	4,130.5	0.99	4,130.5	4,130.5	1.37	2,998.7	4,130.5
Crops	995.0	0.24	995	995	0.33	722.4	995.0
Pasture	2,611.0	0.63	2,611	2,611	0.86	1,895.5	2,611.0
Tree Crops	524.5	0.13	525	525	0.17	380.8	524.5
Stormwater Runoff Forest/Forest Regeneration Segment 19	5,411.8	1.30					
Stormwater Runoff Undeveloped Land Use Segment 19	4,037.3	0.97	4,037.3				4,037.3
Rangeland	194.5	0.05	194.5				194.5
Water/Wetland	3,842.8	0.92	3,842.8				3,842.8
Stormwater Runoff from Developed Uses Segment 19	1,579.8	0.38	1,579.8	1,579.8	0.52	1,146.9	1,579.8
Open Land and Barren Land	30.8	0.01	30.8	30.8	0.01	22.3	30.8
Low-Density Residential	224.1	0.05	224.1	224.1	0.07	162.7	224.1
Transportation and Communication	999.9	0.24	999.9	999.9	0.33	725.9	999.9
Industrial and Commercial	310.2	0.07	310.2	310.2	0.10	225.2	310.2
Medium-Density Residential	14.8	0.00	14.8	14.8	0.00	10.7	14.8
Agriculture Segment 19	4,860.4	1.17	4,860.4	4,860.4	1.61	3,528.6	4,860.4
Crops	941.9	0.23	941.9	941.9	0.31	683.8	941.9
Pasture	2,625.1	0.63	2,625.1	2,625.1	0.87	1,905.8	2,625.1
Tree Crops	1,293.4	0.31	1,293.4	1,293.4	0.43	939.0	1,293.4
Stormwater Runoff Forest/Forest Regeneration Segment 20	648.2	0.16					

Sources of TN	Attenuated TMDL Baseline Loading	% of Attenuated TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Stormwater Runoff Undeveloped Land Use Segment 20	658.7	0.16	658.7				658.7
Rangeland	27.3	0.01	27.3				27.3
Water/Wetland	631.4	0.15	631.4				631.4
Stormwater Runoff from Developed Uses Segment 20	472.6	0.11	472.6	472.6	0.16	343.1	472.6
Transportation and Communication	272.9	0.07	272.9	272.9	0.09	198.1	272.9
Open Land and Barren Land	29.4	0.01	29.4	29.4	0.01	21.3	29.4
Low-Density Residential	139.5	0.03	139.5	139.5	0.05	101.2	139.5
Industrial and Commercial	30.9	0.01	30.9	30.9	0.01	22.4	30.9
Agriculture Segment 20	981.2	0.24	981.2	981.2	0.32	712.3	981.2
Crops	231.8	0.06	231.8	231.8	0.08	168.3	231.8
Pasture	732.3	0.18	732.3	732.3	0.24	531.6	732.3
Tree Crops	17.1	0.00	17.1	17.1	0.01	12.4	17.1
Stormwater Runoff Forest/Forest Regeneration Segment 21	2,554.4	0.61					
Stormwater Runoff Undeveloped Land Use Segment 21	2,852.7	0.69	2,852.7				2,852.7
Rangeland	675.9	0.16	675.9				675.9
Water/Wetland	2,176.9	0.52	2,176.9				2,176.9
Stormwater Runoff from Developed Uses Segment 21	1,229.0	0.30	1,229.0	1,229.0	0.41	892.2	1,229.0
Transportation and Communication	647.8	0.16	647.8	647.8	0.21	470.3	647.8
Open Land and Barren Land	18.6	0.00	18.6	18.6	0.01	13.5	18.6
Low-Density Residential	554.2	0.13	554.2	554.2	0.18	402.3	554.2
Mining	8.4	0.00	8.4	8.4	0.00	6.1	8.4
Agriculture Segment 21	3,677.3	0.88	3,677.3	3,677.3	1.22	2,699.6	3,677.3
Crops	49.5	0.01	49.5	49.5	0.02	35.9	49.5
Pasture	3,627.8	0.87	3,627.8	3,627.8	1.20	2,633.7	3,627.8
Stormwater Runoff Forest/Forest Regeneration Segment 22	1,601.5	0.38					

Sources of TN	Attenuated TMDL Baseline Loading	% of Attenuated TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Stormwater Runoff Undeveloped Land Use Segment 22	166.4	0.04	166.4				166.4
Water/Wetland	166.4	0.04	166				166.4
Stormwater Runoff Forest/Forest Regeneration Segment 23	2,796.2	0.67					
Stormwater Runoff Undeveloped Land Use Segment 23	1,442.6	0.35	1,442.6				1,442.6
Rangeland	101.2	0.02	101.2				101.2
Water/Wetland	1,341.4	0.32	1,341.4				1,341.4
Stormwater Runoff from Developed Uses Segment 23	3,609.4	0.87	3,609.4	3,609.4	1.19	2,620.3	3,609.4
Transportation and Communication	705.8	0.17	705.8	705.8	0.23	512.4	705.8
Open Land and Barren Land	64.4	0.02	64.4	64.4	0.02	46.8	64.4
Low-Density Residential	475.4	0.11	475.4	475.4	0.16	345.1	475.4
Industrial and Commercial	1,615.7	0.39	1,615.7	1,615.7	0.53	1,173	1,615.7
Medium-Density Residential	565.4	0.14	565.4	565.4	0.19	410.5	565.4
High-Density Residential	182.6	0.04	182.6	182.6	0.06	132.6	182.6
Agriculture Segment 23	1,664.0	0.40	1,664.0	1,664.0	0.55	1,208.0	1,644.0
Crops	1,171.5	0.28	1,171.5	1,171.5	0.39	850.5	1,171.5
Pasture	492.0	0.12	492.0	492.0	0.16	357.2	492.0
Tree Crops	0.5	0.00	0.5	0.5	0.00	0.4	0.5
Stormwater Runoff Forest/Forest Regeneration Segment 24	556.7	0.13					
Stormwater Runoff Undeveloped Land Use Segment 24	621.4	0.15	621.4				621.4
Rangeland	10.5	0.00	10.5				10.5
Water/Wetland	610.9	0.15	610.9				610.9
Stormwater Runoff from Developed Uses Segment 24	1,428.4	0.34	1,428.4	1,428.4	0.47	1,037.0	1,428.4
Low-Density Residential	1,159.2	0.28	1,159.2	1,159.2	0.38	841.6	1,159.2
Transportation and Communication	269.2	0.06	269.2	269.2	0.09	195.4	269.2
Agriculture Segment 24	517.1	0.12	517.2	517.1	0.17	375.4	517.1

Sources of TN	Attenuated TMDL Baseline Loading	% of Attenuated TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Crops	23.4	0.01	23.4	23.4	0.01	17.0	23.4
Pasture	493.7	0.12	493.7	493.7	0.16	358.4	493.7
Stormwater Runoff Forest/Forest Regeneration Segment 25	617.0	0.15					
Stormwater Runoff Undeveloped Land Use Segment 25	626.8	0.15	626.8				626.8
Water/Wetland	626.8	0.15	626.8				626.8
Stormwater Runoff from Developed Uses Segment 25	272.8	0.07	272.8	272.8	0.09	198.0	272.8
Low-Density Residential	57.8	0.01	57.8	57.8	0.02	41.9	57.8
Transportation and Communication	215.0	0.05	215.0	215.0	0.07	156.1	215.0
Agriculture Segment 25	384.1	0.09	384.1	384.1	0.13	278.8	384.1
Pasture	384.1	0.09	384.1	384.1	0.13	278.8	384.1
Stormwater Runoff Forest/Forest Regeneration Segment 26	1,204.8	0.29					
Stormwater Runoff Undeveloped Land Use Segment 26	842.8	0.20	842.8				842.8
Rangeland	29.8	0.01	29.8				29.8
Water/Wetland	813.0	0.20	813.0				813.0
Stormwater Runoff from Developed Uses Segment 26	3.0	0.00	3.0	3.0	0.00	2.2	3.0
Low-Density Residential	3.0	0.00	3.0	3.0	0.00	2.2	3.0
Agriculture Segment 26	209.0	0.05	209.0	209.0	0.07	151.7	209.0
Pasture	209.0	0.05	209.0	209.0	0.07	151.8	209.0
Stormwater Runoff Forest/Forest Regeneration Segment 27	5,429.3	1.300					
Stormwater Runoff Undeveloped Land Use Segment 27	2,661.8	0.64	2,661.8				2,661.8
Rangeland	57.4	0.01	57.4				57.4
Water/Wetland	2,604.4	0.63	2,604.4				2,604.4
Stormwater Runoff from Developed Uses Segment 27	2,894.7	0.70	2,894.7	2,894.7	0.96	2,101.5	2,894.7

Sources of TN	Attenuated TMDL Baseline Loading	% of Attenuated TMDL Baseline Loading	Attenuated TMDL Baseline Loading without Forest	Controllable Attenuated TMDL Baseline Loading	Controllable Attenuated TMDL Baseline % Contribution	Proportional Reduction Needed to Meet TMDL	Remaining TN Load
Transportation and Communication	1,243.4	0.30	1243.4	1,243.4	0.41	902.7	1,243.4
Open Land and Barren Land	7.4	0.00	7.4	7.4	0.00	5.4	7.4
Low-Density Residential	897.6	0.22	897.6	897.6	0.30	651.6	897.6
Industrial and Commercial	277.8	0.07	277.8	277.8	0.09	201.7	277.8
Medium-Density Residential	468.4	0.11	468.4	468.4	0.15	340.1	468.4
Agriculture Segment 27	3,366.4	0.81	3,366.4	3.366.4	1.11	2,443.9	3,366.4
Crops	71.7	0.02	71.7	71.7	0.02	52.1	71.7
Pasture	3,293.4	0.79	3,293.4	3,293.4	1.09	2,391.0	3,293.4
Tree Crops	1.2	0.00	1.2	1.2	0.00	0.9	1.2
Atmospheric Deposition	72,825	17.50	72,825				72,825
Internal Loading	266,655	64.09	266,655	266,655	88.22	193,586	266,655
TN Loading Information							
TMDL Baseline TN Loading and % (lbs/yr)	**416,142**	**100.00**	**391,817**	**302,324**	**100.00**	**219,499**	**391,817**
TMDL (lbs/yr)	**172,318**		**172,318**				**172,318**
Reduction Needed in Loading (lbs/yr)	**243,824**		**219,499**				**219,499**

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

Note: Negative values indicate a decrease in TP loading.
[1] Developed land use and undeveloped land uses were not separated.

Sources of TP	TMDL Baseline Loading	% of TMDL Baseline Loading	Controllable TMDL Baseline Loading	Expected Load Reduction from Current Projects	Remaining Phosphorus Load	Expected Load Reduction from Future Projects	Net Estimated TP Load
Stormwater Runoff Lake Wauberg[1]	508	67.9	508	-39	469		469
Developed Land	73	9.8					
Developed Land Reductions				-39			
WAU02 FDOT Fertilizer Cessation				-34			
Agriculture	89	11.9	89				
Agriculture BMPs Reductions				-5			
Septic Systems Lake Wauberg	240	32.1	240		240		240
Loading Information							
TMDL Baseline TP Loading and % (lbs/yr)	**748**	**100.0**	**748**	**-39**	**709**		**709**
TMDL (lbs/yr)	**374**		**374**		**374**		**374**
Reduction Needed in Loading (lbs/yr)	**374**		**374**		**335**		**335**

Table B-4b. Lake Wauberg TN budget (lbs-TN/yr)

Note: Negative values indicate a decrease in TN loading. [1]Developed land use and undeveloped land uses not separated.

Sources of TN	TMDL Baseline Loading	% of TMDL Baseline Loading	Controllable TMDL Baseline Loading	Expected Load Reduction from Current Projects	Remaining Phosphorus Load	Expected Load Reduction from Future Projects	Net Estimated TN Load
Stormwater Runoff Lake Wauberg[1]	2,765	68.0	2,765	-199	2,566		2,566
Developed Land	580	14.3					
Developed Land Reductions				-164			
WAU02 FDOT Fertilizer Cessation				-164			
Agriculture	602	14.8		-35			
Agriculture BMPs Reductions				-35			
Septic Systems Lake Wauberg	1,299	32.0	1,299		1,299		1,299
Loading Information							
TMDL Baseline TN Loading and % (lbs/yr)	**4,064**	**100.0**	**4,064**	**-199**	**3,865**		**3,865**
TMDL (lbs/yr)	**2,062**		**2,062**		**2,062**		**2,062**
Reduction Needed in Loading (lbs/yr)	**2,002**		**2,002**		**1,803**		**1,803**

Table B-5. Alachua Sink TN budget (lbs-TN/yr)

Note: Negative values indicate a decrease in TN loading.
[1] Point source and stormwater loadings were combined.
[2] Summary loading information for wet year from Table 47 in the TMDL report, *Ocklawaha Basin, Alachua Sink, WBID 2720A, Nutrients.*

Sources of TN	TMDL Baseline Loading	% of TMDL Baseline Loading	Controllable TMDL Baseline Loading	Expected Load Reduction from Current Projects	Remaining TN Load	Expected Load Reduction from Future Projects	Net Estimated TN Load
Stormwater Runoff Undeveloped Land Use	72,252	15.4			72,252		72,252
Points Sources and Stormwater Runoff from Developed Uses[1]	167,051	35.7	167,051	-138,190	28,861		28,861
URBAN08-SWT Alachua County Roads Street Sweeping				-44			
SWT02 Depot Ave. Stormwater Park				-661			
URBAN14-SWT Ditch Maintenance				-436			
URBAN16-SWT Stormwater Pond Maintenance				-46			
SWT04 Spring Hill Stormwater Park				-66			
TUM01 SW 5th Ave. Basin				-157			
URBAN01-SWT St. Sweeping				-50			
URBAN04-SWT State Roads Street Sweeping				-76			
AS18 Paynes Prairie Sheet Flow Restoration Project				-125,106			
Gainesville Education Outreach Alachua Sink				-612			
Alachua County Education Outreach Alachua Sink				-400			
Gainesville Education Outreach Alachua Lake				-272			
Alachua County Education Outreach Alachua Lake				-1,500			
SWT38 SE 9th St. Rosewood Trash Trap Maintenance				-27			
SWT39 Sweetwater Wetlands Sediment and Trash Trap Maintenance				-7,383			
TUM33 Tumblin Creek Sediment and Trash Trap Maintenance				-1,274			
Hydrodynamic Separators Sweetwater Branch				-65			
Agriculture	11,434	2.4	11,434	-363	11,071		11,071
Agriculture BMPs				-363			

Sources of TN	TMDL Baseline Loading	% of TMDL Baseline Loading	Controllable TMDL Baseline Loading	Expected Load Reduction from Current Projects	Remaining TN Load	Expected Load Reduction from Future Projects	Net Estimated TN Load
Atmospheric Deposition	23	0.0			23		23
Septic Systems	4,667	1.0	4,667		4,667		4,667
Prairie Creek	212,748	45.4	212,748	-2,304	210,444		210,444
Newnans Lake Projects				-2,304			
Total Loading TN lbs/yr	**468,175**	**100.0**	**395,900**	**-140,857**	**327,318**		**327,318**
Loading Reduction TN							
TMDL Baseline TN Loading and % (lbs/yr)[2]	**462,457**				**321,600**		**321,600**
TMDL (lbs/yr)	**256,322**				**256,322**		**256,322**
Reduction Needed in Loading (lbs/yr)	**206,135**				**65,278**		**65,278**

Appendix C: Lochloosa Lake Loading Calculations

The following tables provide the attenuation rates used to adjust loadings and project credits in the Lochloosa Lake Watershed. **Tables C-1a** and **C-2a** list the individual sub-basin attenuation rates output by the HSPF model as the ratio of the output loading to the input loading. The loadings used for allocations were attenuated for each sub-basin adjusted for flow path length to reach Lochloosa Lake (**Tables C-1b** and **C-2b**) for each year, and then averaged over the period of TMDL development (2004–10). For example, to calculate the attenuated loading for a 100 lbs-TN/yr loading from Sub-Basin 16, 100 lbs-TN/yr is multiplied by each year's attenuation rate (**Table C-1b**) and then averaged for all years. Proportional loading reductions were calculated for each sub-basin, and these reductions were then allocated to jurisdictions for the sub-basin. The total reduction allocated to an entity was the sum of all the sub-basin reductions assigned to that jurisdiction.

Project credits were attenuated using the rates listed in **Table C-3**. These rates are averages of attenuation rates over the period of TMDL development adjusted for distance or flow path length to Lochloosa Lake. Expected project loading reductions are multiplied by the adjusted averaged attenuation rate to estimate the project credits. For example, for a project located in Sub-Basin 16 with an expected loading reduction of 100 lbs-TN/yr, the reduction of 100 lbs-TN/yr is multiplied by 0.410565784 from **Table C-3** to estimate the project credits. Sometimes a project area encompasses multiple sub-basins, in which case credits are proportionally calculated based on the percent area in each sub-basin.

Table C-1a. Lochloosa Lake TN individual sub-basin attenuation rates

Sub-Basin	2004	2005	2006	2007	2008	2009	2010
16	0.938776	1.199357	0.66963	1.502463	1.029412	0.660194	0.615108
17	0.64878	0.530864	0.561141	0.451128	0.583529	0.504	0.465174
18	0.774834	0.79927	0.777778	0.755172	0.79375	0.784722	0.796875
19	0.871921	0.892994	0.855204	0.866906	0.897619	0.873529	0.836842
20	0.775	0.827759	0.785714	0.777778	0.819127	0.799076	0.78022
21	0.936634	0.956751	0.932584	0.930481	0.949627	0.939052	0.928889
22	0.991886	0.994698	0.992278	0.99169	0.994307	0.990762	0.990909
23	0.916583	0.954839	0.95992	0.939511	0.95122	0.944	0.917197
24	1.443709	0.97449	0.822727	0.527331	0.955814	0.683721	0.515625
25	0.901288	0.922141	0.908333	0.91875	0.917647	0.892405	0.909677
26	0.725	0.614144	0.584718	0.476323	0.610619	0.465368	0.540146

Table C-1b. Lochloosa Lake TN attenuation rates adjusted for flow path to lake

Sub-Basin	2004	2005	2006	2007	2008	2009	2010
16	0.4933649	0.541091186	0.297370546	0.542199386	0.509116601	0.270419758	0.220398112
17	0.525540597	0.451151064	0.444081875	0.360873702	0.494570299	0.409606507	0.358307991
18	0.627649932	0.679254028	0.615526423	0.604089561	0.672743215	0.637752455	0.61380619
19	0.810044387	0.849843017	0.791390889	0.799936387	0.847550506	0.812711323	0.770266591
20	0.720001468	0.787760283	0.727086053	0.717693641	0.77343673	0.743441962	0.718149184
21	0.929034152	0.951678306	0.925382586	0.922748703	0.944220773	0.930377038	0.92044447
22	0.991886	0.994698	0.992278	0.99169	0.994307	0.990762	0.990909
23	0.916583	0.954839	0.95992	0.939511	0.95122	0.944	0.917197
24	1.443709	0.97449	0.822727	0.527331	0.955814	0.683721	0.515625
25	0.901288	0.922141	0.908333	0.91875	0.917647	0.892405	0.909677
26	0.725	0.614144	0.584718	0.476323	0.610619	0.465368	0.540146

Table C-2a. Lochloosa Lake TP individual sub-basin attenuation rates

Sub-Basin	2004	2005	2006	2007	2008	2009	2010
16	1.109827	1.444828	0.920354	2.005682	1.203704	0.751412	0.711111
17	0.557265	0.477733	0.516807	0.409449	0.514881	0.465766	0.408964
18	0.71519	0.733333	0.71161	0.657273	0.708075	0.696324	0.698182
19	0.827586	0.844138	0.805825	0.822314	0.846774	0.816901	0.754601
20	0.737265	0.757265	0.716418	0.706271	0.752599	0.7343	0.683616
21	0.923077	0.939573	0.91358	0.912226	0.929336	0.912329	0.901639
22	0.988789	0.990232	0.9869	0.989967	0.988814	0.988406	0.982659
23	0.913861	0.94	0.934701	0.921647	0.925	0.941176	0.86166
24	2.983683	1.531409	1.329897	0.810409	1.186047	0.862408	0.623431
25	0.862559	0.887324	0.830097	0.907801	0.871111	0.86014	0.854015
26	1.599407	0.643243	0.630208	0.517699	0.633333	0.537671	0.561111

Table C-2b. Lochloosa Lake TP attenuation rates adjusted for flow path to lake

Sub-Basin	2004	2005	2006	2007	2008	2009	2010
16	0.467166557	0.542103645	0.345576149	0.609849595	0.482260233	0.257811443	0.194435418
17	0.420936377	0.375202892	0.37548177	0.304060961	0.400646864	0.343102643	0.273424849
18	0.5402268	0.575946528	0.517014248	0.488097565	0.550977854	0.512941272	0.466790006
19	0.755361232	0.785381986	0.726541572	0.742610094	0.778134878	0.736641667	0.668579261
20	0.672922692	0.70455576	0.645931139	0.63781472	0.691593662	0.662156095	0.60568629
21	0.912728384	0.930395251	0.901612102	0.903073637	0.918940448	0.901751458	0.886003678
22	0.988789	0.990232	0.9869	0.989967	0.988814	0.988406	0.982659
23	0.913861	0.94	0.934701	0.921647	0.925	0.941176	0.86166
24	2.983683	1.531409	1.329897	0.810409	1.186047	0.862408	0.623431
25	0.862559	0.887324	0.830097	0.907801	0.871111	0.86014	0.854015
26	1.599407	0.643243	0.630208	0.517699	0.633333	0.537671	0.561111

Table C-3. Lochloosa Lake project attenuation rates by sub-basin adjusted for flow path to lake

Sub-Basin	Average TN Attenuation	Average TP Attenuation
16	0.410565784	0.414171863
17	0.434876005	0.356122337
18	0.635831686	0.521713468
19	0.811677586	0.741892956
20	0.741081331	0.660094337
21	0.931983718	0.907786422
22	0.992361429	0.987966714
23	0.940467143	0.919720714
24	0.846202429	1.332469143
25	0.910034429	0.867578143
26	0.573759714	0.731810286

Appendix D. Projects to Reduce Nutrient Sources

Required project reporting information and definitions of requested information have changed since the first Orange Creek BMAP was adopted in 2008. These adjustments have been necessary to address new Legislative annual project reporting requirements and standardization among BMAPs across the state. At the local level information submitted for earlier projects has become outdated. All projects submitted by local governments are included in this Appendix and proposed for re-adoption with this Amendment.

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 D-1** are ranked as high, medium, or low priority based on project status. Projects with "completed" status are assigned a low priority. Projects classified as "underway" are assigned a medium priority because some resources have been allocated to these projects, but additional assistance may be needed for completion. High priority is assigned to projects listed as "planned," "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 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.

Table D-1. New projects to reduce nutrient sources

O&M = Operation and maintenance; N/A = Not available
Gainesville Clean Water Partnership is a partnership between Alachua County, City of Gainesville, and FDOT District 2

Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Location	Acres Treated	Cost Estimate	Cost Annual O&M	Funding Source	Funding Amount	DEP Contract Agreement Number
Alachua County Environ-mental Protection Department (ACEPD)	City of Gainesville/ FDOT District 2/ SJRWMD	ALACHUA 02-LOCH	Water Quality Protection Public Education and Outreach	Public education to promote stormwater nutrient reduction to protect groundwater and surface water resources, stressing importance of preventing nonpoint source pollution.	Education Efforts	Completed	N/A	335	46	Lochloosa Lake Basin	N/A	N/A	$13,333	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)/ SJRWMD	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2/ SJRWMD	ALACHUA 02-NEW	Water Quality Protection Public Education and Outreach	Public education to promote stormwater nutrient reduction to protect groundwater and surface water resources, stressing importance of preventing nonpoint source pollution.	Education Efforts	Completed	N/A	299	33	Newnans Lake Basin	N/A	N/A	$13,333	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)/ SJRWMD	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2/ SJRWMD	ALACHUA 02-ORANGE	Water Quality Protection Public Education and Outreach	Public education to promote stormwater nutrient reduction to protect groundwater and surface water resources, stressing importance of preventing nonpoint source pollution.	Education Efforts	Completed	N/A	Not provided	4	Orange Lake Basin	N/A	N/A	$13,333	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)/ SJRWMD	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2/ SJRWMD	ALACHUA 02-AS	Education Outreach Credit for Alachua Sink and Alachua Lake	Public education to promote stormwater nutrient reduction to protect groundwater and surface water resources, stressing importance of preventing nonpoint source pollution.	Education Efforts	Completed	N/A	1,900	TBD	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	$13,333	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)/ SJRWMD	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	ALACHUA 03	Water Quality Protection BMP Training	Offer DEP Florida Stormwater, Erosion, and Sedimentation Control Inspector Training. Reduces impacts from uncontrolled erosion and sedimentation on construction sites.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	N/A	$2,000	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A

Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Location	Acres Treated	Cost Estimate	Cost Annual O&M	Funding Source	Funding Amount	DEP Contract Agreement Number
ACEPD	City of Gainesville/ FDOT District 2	ALACHUA 04	Pet Waste Outreach	Alachua County. Implement social marketing campaign to motivate citizens to scoop, bag, and trash dog wastes at home and in community. Reduces bacteria and nutrient sources in all watersheds.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$40,655	$7,000	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	N/A	ALACHUA 05	Stormwater Basin Monitoring	Monitor water quality in various stormwater basins to understand if they are sinks or sources of nutrients and bacteria. Provide data for determining how stormwater basins affect water quality.	Monitoring/Data Collection	Completed	2015	N/A	N/A	Orange Creek Basin	N/A	$6,000	N/A	Alachua County General Fund	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	ALACHUA 06	Landscaping Debris Social Marketing	Implement social marketing campaign designed to get citizens to keep landscaping debris out of roads and stormwater collection systems. Reduces bacteria and nutrient sources in all watersheds.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$50,000	$7,000	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	ALACHUA 07	Water Conservation and LID	Conduct targeted public outreach to encourage water conservation and rain harvesting. Includes rain barrel sales and LID promotion.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	N/A	Not provided	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 3	ALACHUA 08	Water Quality Protection and Public Education and Outreach	Public education to promote stormwater nutrient reduction to protect groundwater and surface water resources and prevent non-point source pollution	Education Efforts	Completed	2017	N/A	N/A	Orange Creek Basin	N/A	N/A	$10,000	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A

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ACEPD	City of Gainesville/ FDOT District 2/ SJRWMD	ALACHUA 09	Landscaping Behavior Change Social Marketing	Implement social marketing campaign designed to get citizens to make landscaping behavior changes that reduce nutrients in stormwater. Reduces nutrients sources in all watersheds.	Education Efforts	Underway	2019	Not provided	Not provided	Orange Creek Basin	N/A	$600,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)/ SJRWMD	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	ALACHUA 10	Neighborhood Stormwater Fertilizer Study	Monitor and assess stormwater water quality in selected neighborhoods and evaluate impacts to water quality in Gainesville urban creeks.	Study	Completed	2015	N/A	N/A	Orange Creek Basin	N/A	$24,600	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 3	ALACHUA 11	Stormwater Pond Outfall Study and Phosphorus Sediment Evaluation	Monitor and assess water quality in various stormwater basins and evaluate stormwater basin and stream sediments to understand if they are sinks or sources of phosphorus.	Study	Completed	2015	N/A	N/A	Orange Creek Basin	N/A	$30,800	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 4	ALACHUA 12	Quantifying Nutrient Improvement in Street Sweepings	Monitor and assess street sweepings to quantify nutrient reductions and subsequent potential water quality improvements.	Study	Completed	2016	N/A	N/A	Orange Creek Basin	N/A	$38,940	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 5	ALACHUA 13	Surface Water Nutrient Loading Assessment	Evaluate nutrient loading and determine status of urban streams and their receiving waters as it relates to nutrient impairment	Study	Underway	2018	N/A	N/A	Orange Creek Basin	N/A	$48,800	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A

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ACEPD	City of Gainesville/ FDOT District 6	ALACHUA 14	In-Stream Biological Monitoring in 2012-13	Monitor to establish in-stream biological ecosystem health. Conduct stream condition index and Hester-Dendy sampling and reporting for Gainesville urban area streams.	Monitoring/Data Collection	Completed	2014	N/A	N/A	Orange Creek Basin	N/A	$55,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	Wildlife Foundation of Florida/ Gainesville Clean Water Partnership	ALACHUA 17	Aquifer Model	Mobile model used for outreach to children and adults designed and created to teach public about connection between how what we do on land surface and how we use water affects our springs, rivers, and aquifer.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$6,000	Not provided	County/ Fish and Wildlife Foundation of Florida Springs Protection License Plate Grant	Not provided	N/A
ACEPD	N/A	ALACHUA 18	Orange Creek Basin Project Development	Assessed short- and longterm benefits/costs of removing loose organic sediments from portions of Newnans Lake to restore hard-bottom aquatic habitats and reduce internal nutrient recycling, while protecting archeological resources	Study	Completed	2015	N/A	N/A	Newnans Lake Basin	N/A	$7,600	N/A	Alachua County	Not provided	N/A
ACEPD	DEP/ City of Gainesville/ FDOT District 2	ALACHUA 19	Fertilizer Social Marketing Campaign	Implement social marketing campaign designed to reduce fertilizer use and to estimate resultant load reduction. Reduces nutrient sources in all watersheds.	Education Efforts	Planned	2021	N/A	N/A	Orange Creek Basin	N/A	$435,000	N/A	DEP 319 Grant	DEP– $135,000	Fertilizer Social Marketing Campaign and Load Reduction NF033
ACEPD	Adventure Outpost	ALACHUA 20	Inspiring Behavior Change through Experiencing the Santa Fe River and Springs	Implement education by coordinating 5 to 6 interactive paddling trips on Santa Fe River with 120 stakeholders to explore actions that affect health of springs and groundwater. Reduces nutrient sources in all watersheds.	Education Efforts	Planned	2019	N/A	N/A	Orange Creek Basin	N/A	12,600	N/A	County/ Fish and Wildlife Foundation of Florida Springs Protection License Plate Grant	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	ALACHUA 21	Interactive Stormwater/ Wastewater Model	Interactive tabletop model for teaching children and adults about difference between storm sewers and sanitary sewers. Reduces nutrient sources and bacteria sources in all watersheds.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$6,500	Not provided	Gainesville Clean Water Partnership	Not provided	N/A

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ACEPD	City of Gainesville/ FDOT District 2	ALACHUA 22	Stream Bioassessment Study Project	Stream Bioassessment Study project includes Stream Condition Index (SCI) in-stream biological assessments and Hester-Dendy sampling and analysis to provide ambient monitoring for TMDL and impaired watersheds.	Study	Underway	2019	N/A	N/A	Orange Creek Basin	N/A	$85,970	N/A	Gainesville Clean Water Partnership	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	ALCODE01	Alachua County Water Quality Code Implementation	Alachua County Water Quality Code Implementation includes Public education, outreach, and enforcement.	Regulations, Ordinances, and Guidelines	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$17,400	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	N/A	ALCODE02	Fertilizer and Landscape Irrigation Codes	Adopt and enforce Fertilizer Management and Landscape Irrigation Ordinances. Reduce volume of runoff from over irrigation and reduce nutrient loading from use of fertilizers.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	N/A	Not provided	Alachua County General Fund	Not provided	N/A
ACEPD	N/A	AS04	Expanded Nutrient Monitoring Alachua Sink	Expanded nutrient monitoring of Alachua Sink. To determine current water quality and water level conditions in Alachua Sink.	Monitoring/ Data Collection	Completed	2004	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$5,600	N/A	Alachua County	Not provided	N/A
ACEPD	N/A	BACTERIA 01	Bacterial Source Tracking	Bacterial source tracking by antibiotic resistance analysis (ARA) and discriminate ribotype analysis to determine sources of fecal indicator bacteria.	Monitoring/ Data Collection	Completed	2003	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$24,600	N/A	Alachua County	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	BACTERIA 02	Fecal Coliform Source Assessment	Fecal coliform source assessment using expanded microbiological sampling and selected microbial source tracking techniques.	Monitoring/Data Collection	Completed	2007	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$45,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A

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ACEPD	City of Gainesville/ FDOT District 2	BACTERIA 03	Coliform Wet and Dry Season Assessment	Assessment of wet and dry season fecal coliform concentrations in Gainesville urban creeks.	Study	Completed	2007	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$15,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	N/A	BACTERIA 04	Expanded Fecal Coliform Bacteria Monitoring	Expanded base flow fecal coliform monitoring to better identify stream segments in Gainesville urban area with high bacterial counts.	Monitoring/Data Collection	Completed	N/A	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	N/A	$30,000	Alachua County	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	BACTERIA 06	Optical Brighteners	Optical brightener and fecal coliform sampling analyses throughout Gainesville urban creek watersheds for illicit discharge detection.	Study	Completed	2006	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$9,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	DEP/ City of Gainesville/ Gainesville Regional Utilities (GRU)/ Alachua County Health Department (ACHD)	BACTERIA 16	Evaluation of Fecal Coliform Bacteria "Hot Spots" in Gainesville Urban Creeks Addresses Bacteria TMDL	Further investigation of locations in Gainesville urban creeks with continued high fecal coliform bacteria counts.	Monitoring/ Data Collection	Completed	Not provided	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	Not provided	N/A	Not provided	Not provided	Not provided
ACEPD	City of Gainesville/ FDOT District 2	BACTERIA 17	Outfall Reconnaissance Inventory (ORI)	Gainesville urban area. Reconnaissance of all outfalls and visual observations and sampling of suspect outfalls and stormwater pipes discharging to urban creeks with high fecal coliform concentrations. Identify and eliminate sources.	Study	Completed	2010	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$1,100	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A

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ACEPD	N/A	BACTERIA 18	Private Wastewater Collection System Pilot Study	Gainesville Urban Area. Conducted pilot study of private wastewater collection systems. Pilot tests were conducted and report was written. ACEPD may pursue private collection system monitoring program in future.	Study	Completed	2008	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	Not provided	N/A	Alachua County General Fund	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	BACTERIA 19	Hydrodynamic Separator and Fecal Coliform Study	Gainesville Urban Area. Goal of this study is to assess potential of hydrodynamic separator storm sewer BMP devices to harbor and release high levels of bacteria into Gainesville creeks.	Study	Completed	2015	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$12,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	BACTERIA 20	Urban Creek Fecal Coliform “Hot Spots” Monitoring	Assess fecal indicator bacteria to assess microbial (fecal coliform) "hot spots" for source investigation.	Monitoring/Data Collection	Completed	2017	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	N/A	$7,300	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	HAT01	Expanded Coliform and Iron Monitoring	Targeted fecal indicator bacteria monitoring in Hatchet Creek Watershed to better define spatial distribution of fecal indicator bacteria.	Monitoring/Data Collection	Completed	2006	N/A	N/A	Newnans Lake Basin	N/A	$5,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	HOG24	Inlet Protection Pilot Project, Hogtown Creek	Assessment of stormwater drop inlet geotextile filtering device function to quantify sediments, particle sizes, and pollutants.	Study	Completed	2007	N/A	N/A	Hogtown Creek Basin	N/A	$2,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A

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ACEPD	City of Gainesville/ FDOT District 2	HOG26	Forest Park Vegetative Enhancement	Stormwater pond vegetative enhancement to demonstrate importance of vegetated buffers in preventing nonpoint source pollution and improving water quality.	Vegetated Buffers	Completed	Not provided	Not provided	Not provided	Hogtown Creek Basin	12,800	$7,500	Not provided	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)/ NOAA Coastal Impact Assistance Program (CIAP) Grant	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	NEW32	Little Hatchet Creek	Field survey and sampling of stream bank soils along Little Hatchet Creek near Gainesville Regional Airport to evaluate soil/sediment phosphorus.	Monitoring/ Data Collection	Completed	2015	N/A	N/A	Newnans Lake Basin	N/A	$5,235	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	N/A	NEW33	Little Hatchet Creek	Field survey and sampling of stream bank soils along Little Hatchet Creek near Gainesville Regional Airport to evaluate soil/sediment phosphorus.	Monitoring/ Data Collection	Canceled	2015	N/A	N/A	Newnans Lake Basin	N/A	$7,387	N/A	Alachua County	Not provided	N/A
ACEPD	N/A	NEW36	Reduce Phosphorus Load to Newnans Lake from Little Hatchet Creek	Identify and prioritize cost effective restoration strategies to improve water quality in headwaters of Newnans Lake. Perform predesign studies focused phosphorus reduction in Little Hatchet Creek.	Study	Canceled	N/A	N/A	N/A	Newnans Lake Basin	N/A	$130,000	N/A	DEP	Not provided	N/A
ACEPD	N/A	NEW37	Reduce Phosphorus Load to Newnans Lake from Gum Root Swamp	Identify and prioritize cost-effective restoration strategies to improve water quality in headwaters of Newnans Lake. Perform predesign studies focused on phosphorus reduction in Gum Root Swamp.	Study	Canceled	N/A	N/A	N/A	Newnans Lake Basin	N/A	$116,000	N/A	DEP	Not provided	N/A
ACEPD	TBD	NEW39	Newnans Lake Shoreline Sediments Nutrient Sampling	Newnans Lake. Conduct shoreline sampling of sediments to evaluate nutrient hotspots and chemical makeup of surface sediments to better understand sediment surface interactions along Newnans Lake shoreline.	Monitoring/ Data Collection	Planned	TBD	N/A	N/A	Newnans Lake Basin	N/A	Not provided	N/A	Not provided	Not provided	N/A

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ACEPD	City of Gainesville/ Gainesville Regional Airport	NEW40	Newnans Lake Improvement Initiative Phase I	Identify and prioritize cost effective restoration strategies to improve water quality in headwaters of Newnans Lake. Perform predesign studies focused on phosphorus reduction in Little Hatchet Creek and Gum Root Swamp.	Study	Completed	2017	N/A	N/A	Newnans Lake Basin	N/A	$456,000	N/A	DEP	Not provided	Not provided
ACEPD	DEP	NEW42	Newnans Lake Improvement Initiative (NLII) Phase II	NLII Phase II project includes construction of permeable reactive weir for Little Hatchet Creek and assessment of Hatchet Creek to locate potential areas for in-stream nutrient reduction treatment.	Permeable Reactive Weir	Underway	2020	Not provided	Not provided	Orange Creek Basin	Not provided	$315,000	Not provided	Legislative Funding Administered through DEP Division of Water Restoration Assistance/ SJRWMD Cost-Share	$250,000/ $65,000	LP01121
ACEPD	N/A	SWT18	Expanded Nutrient Monitoring Sweetwater Branch	Expanded nutrient monitoring of Sweetwater Branch to determine water quality and water level conditions in Sweetwater Branch on Paynes Prairie and Alachua Sink.	Monitoring/Data Collection	Completed	2004	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$5,600	N/A	Alachua County	Not provided	N/A
ACEPD	UF–IFAS Extension Service/ NOAA/ City of Gainesville/ FDOT District 2/ Current Problems, Inc. (Adopt A River)	SWT22	Springhill Pond Vegetative Enhancement	Stormwater pond vegetative enhancement to demonstrate importance of vegetated buffers in preventing nonpoint source pollution and improving water quality.	Vegetated Buffers	Completed	Not provided	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$7,500	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
ACEPD	City of Gainesville/ FDOT District 2	SWT29	Inlet Protection Pilot Project, Sweetwater Branch	Assessment of stormwater drop inlet geotextile filtering device function to quantify sediments, particle sizes, and pollutants.	Study	Completed	2007	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$2,000	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A

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ACEPD	City of Gainesville/ FDOT District 2	SWT30	In-stream Bioassessments in the Hogtown Creek, Sweetwater Branch, Tumblin Creek, Little Hatchet Creek, Hatchet Creek, and Lake Forest Creek Watersheds	In-stream bioassessments of urban creeks for comparison with historical BioRecon data to determine current status of in-stream biological health.	Monitoring/Data Collection	Completed	2010	N/A	N/A	Orange Creek Basin	N/A	$68,375	N/A	FDOT District 2/ Alachua County	FDOT District 2– $47,675/ Alachua County– $20,700	N/A
ACEPD	N/A	SWT37	Sweetwater Preserve Trailhead Retrofit	Project will retrofit existing parking area for Sweetwater Preserve Trailhead with Low Impact Design (LID) stormwater best management practices (BMPs).	BMP Treatment Train	Underway	2019	TBD	TBD	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	1.5	$345,000	N/A	Alachua County	$345,000	N/A
ACEPD	UF–IFAS Extension Service/ City of Gainesville/ FDOT District 2/ Current Problems, Inc. (Adopt A River)	TUM18	Tumblin Basin Vegetative Enhancement	Public education workshop conducted to provide information to citizens about stormwater pond vegetative enhancement.	Education Efforts	Completed	Not provided	N/A	N/A	Tumblin Creek Basin	N/A	$7,500	N/A	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
Alachua County Parks and Conservation Lands (ACPCL)	N/A	AS07	Bishop and Henderson	Land acquisition adjacent to Paynes Prairie. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2006	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	25	$225,700	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	N/A	AS08	Crevasse	Paynes Prairie. Land acquisition–Crevasse Prairie Creek by Paynes Prairie. Alachua Conservation Trust purchased parcel and Alachua County Forever has offered to purchase portion of it from ACT.	Land Acquisition	Completed	2010	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	94	$415,316	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A

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ACPCL	N/A	AS17	Prairie Creek Conservation Cemetery	Paynes Prairie. Conservation Easement acquisition–Crevasse Prairie Creek by Paynes Prairie. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2010	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	79	$324,022	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	Paynes Prairies Preserve State Park	AS20	Teuton	Paynes Prairie. Alachua County. Land acquisition–Teuton parcel 2.02 acres. To be managed as part of Paynes Prairie Preserve State Park.	Land Acquisition	Completed	2014	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	2	$11,424	N/A	Wild Spaces Public Place Surtax	Not provided	N/A
ACPCL	Alachua County	LOCH05	Silver Springs/ McLeod	Cross Creek. Land acquisition–Silver Springs/McLeod property in Cross Creek area (working on conservation easement with owner).	Land Acquisition	Canceled	N/A	N/A	N/A	Lochloosa Lake Basin	N/A	Not provided	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	ACT	LOCH06	Phifer Flatwoods Land Acquisition #1–Lochloosa	Alachua County. Land acquisition–Phifer Flatwoods Little Lochloosa Creek Watershed.	Land Acquisition	Completed	2006	N/A	N/A	Lochloosa Lake Basin	634	$2,882,239	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	ACT	LOCH13	Phifer Flatwoods Land Acquisition #2 – Lochloosa	Alachua County. Land acquisition–Phifer Flatwoods Additions within Little Lochloosa Creek Watershed.	Land Acquisition	Completed	2009	N/A	N/A	Lochloosa Lake Basin	325	$1,170,864	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	SJRWMD/ U.S. Dept. of the Interior Federal Forest Legacy Program (FFLP)	NEW06	Newnans Lake Addition	Newnans Lake. Land acquisition–Newnans Lake addition.	Land Acquisition	Completed	2005	N/A	N/A	Newnans Lake Basin	1,708	$3,732,026	N/A	Alachua County Forever Bond Proceeds/ SJRWMD/ FFLP Cost-Share	Alachua County Forever Bond Proceeds – $1,617,000	N/A
ACPCL	N/A	NEW07	Wainberg Land Acquisition	Newnans Lake. Land acquisition–Wainberg (west side Newnans Lake).	Land Acquisition	Completed	2007	N/A	N/A	Newnans Lake Basin	25	$175,000	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	N/A	NEW20	Cox and Moore Buck Bay Flatwoods	Land acquisition. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2013	N/A	N/A	Newnans Lake Basin	460	$1,400,723	N/A	Alachua County Forever Bond Proceeds/ Wild Spaces and Public Places Sales Tax	Not provided	N/A
ACPCL	N/A	NEW21	Kincaid and Tabone	Alachua County. Conservation easement acquisition–Kincaid and Tabone.	Land Acquisition	Completed	2012	N/A	N/A	Newnans Lake Basin	130	$170,000	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A

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ACPCL	N/A	NEW22	Smith	Alachua County. Conservation Easement acquisition–Smith. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2012	N/A	N/A	Newnans Lake Basin	30	$63,750	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	N/A	NEW23	Wainberg Addition Number 2	Alachua County. Land acquisition–Wainberg Addition. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2013	N/A	N/A	Newnans Lake Basin	1.3	$14,363	N/A	Alachua County Forever Bond Proceeds	Not provided	N/A
ACPCL	N/A	NEW34	Floyd Acquisition	Newnans Lake. Alachua County. Land acquisition- Floyd parcel 1.41 acres. To be managed as part of Newnans Lake Cypress Preserve.	Land Acquisition	Completed	2015	N/A	N/A	Newnans Lake Basin	1.4	$15,501	N/A	Wild Spaces Public Place Surtax	Not provided	N/A
ACPCL	U.S. Fish and Wildlife Service (FWS)	OCB02	Little Orange Creek Land Acquisition	Alachua County. Land acquisition–Little Orange Creek. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2012	N/A	N/A	Orange Creek Basin	702	$1,775,000	N/A	Alachua County Fee Simple/ Wild Spaces and Public Places Sales Tax/ North American Wetland Act Grant/ ACT	Not provided	N/A
ACPCL	SJRWMD	OR02	Longleaf Flatwoods Preserve Land Acquisition	Alachua County. Land acquisition–Longleaf Flatwoods Preserve.	Land Acquisition	Completed	2003	N/A	N/A	Orange Lake Basin	1,388	$2,191,500	N/A	Alachua County Forever Bond Proceeds, SJRWMD	Not provided	N/A
ACPCL	U.S. Department of Agriculture (USDA)/ Farm and Ranchland Protection Program (FRPP)	OR08	Freddy Wood Land Tract Acquisition	Orange Lake. Land acquisition–Freddy Wood Tract. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation	Land Acquisition	Completed	2008	N/A	N/A	Orange Lake Basin	136	$1,136,000	N/A	Alachua County Forever Bond Proceeds, FRPP Cost-Share	Not provided	N/A
ACPCL	SJRWMD	OR09	Rayonier Land Tract (River Styx Wetland)	River Styx. Land acquisition–Rayonier Tract River Styx. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2008	N/A	N/A	Orange Lake Basin	1,354	$4,603,600	N/A	Alachua County Forever Bond Proceeds, SJRWMD Cost-Share	Not provided	N/A

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ACPCL	N/A	OR10	Richardson Tract (River Styx)	River Styx. Land acquisition–Richards on NW corner of Orange lake to River Styx. Benefits are no increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Canceled	N/A	N/A	N/A	Orange Lake Basin	N/A	N/A	N/A	N/A	N/A	N/A
ACPCL	Florida Communities Trust (FCT)/ North American Wetlands Conservation Act/ FRPP/ Private Donors	OR23	Barr Hammock, Levy Prairie, Ledwith Lake Land Acquisitions	Between Wacahoota Road, I-75, SR 121 and Marion County Line/ Land acquisition–Barr Hammock Levy Prairie Ledwith Lake.	Land Acquisition	Completed	Not provided	N/A	N/A	Orange Lake Basin	5,618	$14,712,376	N/A	Alachua County Forever Bond Proceeds/ Wild Spaces and Public Places Sales Tax/ FCT/ North American Wetlands Conservation Act/ FRPP/ Private Cost-Share	Wild Spaces and Public Places Sales Tax–$4,026,614	N/A
ACPCL	FCT	SWT31	Sweetwater Preserve	Paynes Prairie. Land acquisition–Sweetwater Preserve (north rim of Paynes Prairie) Benefits are no increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2006	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	113	$7,703,978	N/A	Alachua County Forever Bond Proceeds, FCT Cost-Share	Not provided	N/A
ACPCL	USDA/ Farm & Ranch Land Protection Program (FRPP)	LOCH18	Cypress Point Creamery Land Acquisition	Conservation Easement Acquisition. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2014	N/A	N/A	Lochloosa Lake Basin	225	$461,000	N/A	Wild Spaces and Public Places Surtax/ FRPP Cost-Share	Not provided	N/A
ACPCL	USDA/ FRPP	LOCH19	Higginbotham Ranch Acquisition	Conservation Easement Acquisition. No increase in surface runoff of pollutants because of land use change, continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2014	N/A	N/A	Lochloosa Lake Basin	318	$756,000	N/A	Wild Spaces and Public Places Surtax/ FRPP Cost-Share	Not provided	
ACPCL	Alachua Conservation Trust	LOCH20	Lochloosa Slough – Fox Pen	Fee Simple Acquisition. No increase in surface runoff of pollutants because of land use change; continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2019	N/A	N/A	Orange Creek Basin	578	$1,321,177	N/A	Wild Spaces and Public Places II Surtax	Not provided	N/A

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ACPCL	Alachua Conservation Trust	AS21	Paynes Prairie – Serenola	Fee Simple Acquisition. No increase in surface runoff of pollutants because of land use change; continued aquifer recharge and ecosystem/habitat preservation.	Land Acquisition	Completed	2018	N/A	N/A	Paynes Prairie Basin	111	$3,222,966	N/A	Wild Spaces and Public Places II Surtax	Not provided	N/A
Florida Department of Health in Alachua County (ACHD)	N/A	HOG15	Evaluation of Residential Septic Tanks Systems Adjacent to Hogtown and Possum Creeks, Tumblin Creek, and Sweetwater Branch	Alachua County. Includes identifying parcels with septic systems, conducting soil borings to check water table, and fecal coliform analyses. Staffed with full-time temporary OPS position (one year).	Study	Completed	2005	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$20,000	N/A	FDOH	Not provided	N/A
ACHD	Not provided	WAU01	Evaluation of Septic Systems Surrounding Lake Wauberg	Lake Wauberg Watershed. Includes identifying parcels with septic systems, conducting soil borings to check water table, and sampling for nutrients.	Study	Completed	2005	N/A	N/A	Lake Wauberg Basin	N/A	$15,000	N/A	FDOH	Not provided	N/A
Alachua County Public Works Department (ACPWD)	N/A	LOCH09	NE 179th Street Erosion Control	Intersection of NE 179th St. and SR 26. Description: Construction of sediment trap in roadside swale of NE 179th St. to trap sediment from street that is discharged into swales on SR 26 and eventually into Lochloosa Creek.	Baffle Boxes –1st Generation (hydro-dynamic separator)	Completed	2010	Not provided	Not provided	Lochloosa Lake Basin	Not provided	Not provided	Not provided	Not provided	Not provided	N/A
ACPWD	N/A	URBAN08-HOG	Alachua County Roads Street Sweeping	Urban Area. Sweeping of Alachua County-maintained roads within urbanized area. Benchmark frequency for sweeping of roads with curb and gutter is recurring 90-day cycle.	Street Sweeping	Completed	N/A	109	70	Hogtown Creek Basin	N/A	N/A	Not provided	Alachua County	Not provided	N/A
ACPWD	N/A	URBAN08-NEW	Alachua County Roads Street Sweeping	Urban Area. Sweeping of Alachua County-maintained roads within urbanized area. Benchmark frequency for sweeping of roads with curb and gutter is recurring 90-day cycle.	Street Sweeping	Completed	N/A	65	42	Newnans Lake Basin	N/A	N/A	Not provided	Alachua County	Not provided	N/A
ACPWD	N/A	URBAN08-SWT	Alachua County Roads Street Sweeping	Urban Area. Sweeping of Alachua County-maintained roads within urbanized area. Benchmark frequency for sweeping of roads with curb and gutter is recurring 90-day cycle.	Street Sweeping	Completed	N/A	44	28	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	Not provided	Alachua County	Not provided	N/A

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City of Gainesville	Gainesville Clean Water Partnership/ Current Problems, Inc.	ALACHUA 15	Waterway Clean-up and Shore Restoration Programs	Mobile model used for outreach to children and adults designed and created to teach public about connection between how what we do on land surface and how we use water affects our springs, rivers, and aquifer.	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	N/A	$18,000	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
City of Gainesville	Alachua County/ FDOT District 2/ UF– IFAS/ Alachua County Extension	ALACHUA 16	Florida Friendly Landscaping Education Programs	Commercial/Residential Landscape Education Program	Education Efforts	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	N/A	$10,000	Gainesville Clean Water Partnership (Alachua County/ City of Gainesville/ FDOT District 2)	Not provided	N/A
City of Gainesville	Alachua County/ FDOT District 2	MSPERMIT 01	City of Gainesville Water Pollution Prevention Program NPDES MS4 Permit	Urbanized area of Gainesville and Alachua County. City of Gainesville Water Pollution Prevention Program NPDES MS4 Permit.	Education Efforts	Completed	N/A	N/A	N/A	Regulated MS4 Area	N/A	$4,774,500	N/A	City of Gainesville Stormwater Management Utility Fee/ Gainesville Clean Water	City of Gainesville – $1,771,300	N/A
City of Gainesville	FCT	NEW16	Duval Neighborhood Stormwater Park Land Acquisition	Duval Basin land acquisition.	Land Acquisition	Completed	Not provided	N/A	N/A	Newnans Lake Basin	N/A	$238,291	N/A	FCT/ CDBG	FCT– $140,412/ CDBG– $97,879	N/A
City of Gainesville	FCT/ DEP/ FDOT/ Housing and Urban Development (HUD)	NEW19	Duval Stormwater Park	Duval Stormwater Park is located on NE 21st St. in Gainesville "Front Porch Community".	Regional Stormwater Treatment	Completed	2011	653	95	Newnans Lake Basin	68	$891,609	N/A	Stormwater Management Utility Fees/ FDOT Cost-Share Grant/ DEP Grant/ Community Development Block Grant (CDBG)/ FCT Funds	Not provided	Not provided
City of Gainesville	N/A	NEW28	Duval Heights Drainage Improvements	Lake Forest Creek Watershed. Construction of roadside swales to help prevent flooding of existing paved streets and will provide additional treatment prior to discharging to Duval Stormwater Park.	Grass swales without swale blocks or raised culverts	Canceled	N/A	N/A	N/A	Newnans Lake Basin	N/A	N/A	N/A	N/A	N/A	N/A

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City of Gainesville	N/A	NEW29	Smokey Bear Road Underpass Improvements	Little Hatchet Creek Watershed. Underpass upgrade. Replacement and upgrade to an existing underpass for Little Hatchet Creek to prevent upstream flooding and erosion control.	Stormwater System Rehabilitation	Canceled	N/A	N/A	N/A	Newnans Lake Basin	N/A	N/A	N/A	N/A	N/A	N/A
City of Gainesville	N/A	NEW30	Lake Forest Creek Watershed Master Study	Lake Forest Creek Watershed. Conduct watershed master plan to determine projects to benefit watershed along with Newnans Lake.	Study	Planned	2018	N/A	N/A	Newnans Lake Basin	N/A	$300,000	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	NEW41	Pleasant Acres Storm Sewer	Provides compensating treatment for redevelopment site. Reduces sediment load and nutrient loads. Improve water quality.	Regional Stormwater Treatment	Completed	Not provided	Not provided	Not provided	Newnans Lake Basin	Not provided	$70,176	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	FDOT/ SJRWMD	SWT02	Depot Avenue Stormwater Park	Depot Avenue. 32-acre brownfield restoration site includes 11-acre wet detention pond developed within park. Reduce sediment load and nutrient loads.	Wet Detention Pond	Completed	2007	661	256	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	118	$7,162,000	N/A	SJRWMD/ Florida Legislature/ FDOT District 2/ City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	EPA	SWT03	Duck Pond Restoration	NE 10th Avenue to NE 5th Avenue. Creek restoration project to remove concrete channel and add sinuosity and wetland plants to 2,500-foot channel. Two CDS units added.	Hydrodynamic Separators	Completed	2005	Not provided	Not provided	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$1,040,000	N/A	EPA Grant/ City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	SWT04	Spring Hill Stormwater Park	Springhill Community. Southeast Gainesville; 3.6-acre stormwater park designed to treat runoff from residential areas. Water quality improvement from wet detention.	Wet Detention Pond	Completed	2003	66	22	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	8	$170,000	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	EPA	SWT24	Sweetwater Branch Watershed Management Plan Update and Land Acquisition	Sweetwater Branch Watershed. Study to identify and prioritize new water quality treatment projects and develop stream stabilization plan.	Study	Completed	2006	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$530,000	N/A	City of Gainesville Stormwater Management Utility Fee/ EPA grant	Not provided	N/A

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City of Gainesville	EPA	SWT33	NW 2nd Street Land Acquisition	Upper Sweetwater Branch Watershed. Land acquisition for future stormwater treatment. Future site of water quality improvement project.	Land Acquisition	Completed	2006	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$58,470	N/A	EPA	Not provided	N/A
City of Gainesville	EPA	SWT34	NW 14th Avenue Land Acquisition	Upper Sweetwater Branch Watershed. Land acquisition for future stormwater treatment. Future site of water quality improvement project.	Land Acquisition	Completed	2004	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$57,600	N/A	EPA	Not provided	N/A
City of Gainesville	EPA	SWT35	SE 19th Street, Rosewood Trash Trap Land Acquisition	Upper Sweetwater Branch Watershed. Land acquisition for future stormwater treatment. Future site of water quality improvement project.	Land Acquisition	Completed	2004	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$4,135	N/A	EPA	Not provided	N/A
City of Gainesville	DEP	SWT36	Southeast (SE) 9th Street, Rosewood Trash Trap	Upper Sweetwater Branch Watershed. Stormwater Treatment facility. Water quality improvement project.	Catch Basin Inserts/Inlet Filter Cleanout	Completed	N/A	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$350,000	N/A	City of Gainesville/ DEP	Not provided	Not provided
City of Gainesville	N/A	SWT38	Southeast (SE) 9th St., Rosewood Trash Trap Maintenance	Upper Sweetwater Branch Watershed. Stormwater Treatment facility maintenance. Water quality improvement project.	Sediment Trap	Completed	2018	27	12	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	Not provided	N/A	$500	City of Gainesville Stormwater Management Utility Fee	$500	N/A
City of Gainesville	N/A	SWT39	Sweetwater Wetlands Sediment and Trash Trap Maintenance	Sweetwater Branch Watershed. Maintenance of sediment trap at Sweetwater Wetlands Park. Removal of nutrients and sediment before discharge into Sweetwater Wetlands Park.	Sediment Trap	Completed	2018	7,383	2,992	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	Not provided	N/A	$366,050	City of Gainesville Stormwater Management Utility Fee	$366,050	N/A
City of Gainesville	N/A	TUM01	SW 5th Avenue Basin	SW 5th Avenue. 4.8-acre site contains 2.5-acre wet detention pond for water quality improvement. Site is located next to 3.5-acre Tumblin Creek Park. Benefits are reduced sediment load and nutrient loads.	Wet Detention Pond	Completed	2003	157	20	Tumblin Creek Basin	51	$1,147,818	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A

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City of Gainesville	N/A	TUM02	SW 11th Avenue Storm Sewer	1200 block SW 11th Avenue. Improvement to storm sewer system. Stabilize creek outfall. Reduces sediment load.	Stormwater System Rehabilitation	Completed	2004	Not provided	Not provided	Tumblin Creek Basin	Not provided	$88,000	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	Not provided	TUM03	Tumblin Creek Watershed Management Plan Update	Tumblin Creek Watershed. Study to identify and prioritize new water quality treatment projects and low-impact development options. Pollutant loading model developed and pollutant load reduction projects have been identified and ranked.	Study	Completed	2007	N/A	N/A	Tumblin Creek Basin	N/A	$246,426	N/A	City of Gainesville Stormwater Management Utility Fee/ Community Redevelopment Agency (College Park and University Heights Neighborhood Boards)	Not provided	N/A
City of Gainesville	FDOT	TUM23	Tumblin Creek Sediment and Trash Trap	Tumblin Creek Watershed. Stormwater sediment and trash trap. Water quality improvement project by removal of debris, sediment and potential pollutants.	Catch Basin Inserts/Inlet Filter Cleanout	Completed	N/A	Not provided	Not provided	Tumblin Creek Basin	N/A	$1,440,785	N/A	City of Gainesville Stormwater Management Utility Fee/ FDOT	City of Gainesville Stormwater Management Utility Fee– $1,250,000/ FDOT– $190,785	N/A
City of Gainesville	Alachua County	TUM24	City of Gainesville Rain and Weather Gauges	Gainesville Urban Area. Installation of three weather stations to monitor rain, temperature and other weather data at various points across Gainesville.	Monitoring/Data Collection	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$7,194	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	TUM25	Tumblin Creek SW 9th Street Pipe Upgrade	Tumblin Creek Watershed. Stormwater pipe upgrade. Replacement of existing older pipes to better convey stormwater to headwaters of Tumblin Creek.	Stormwater System Rehabilitation	Completed	Not provided	Not provided	Not provided	Tumblin Creek Basin	N/A	$920,000	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	TUM26	Tumblin Creek West 6th Street Pipe Upgrade	Tumblin Creek Watershed. stormwater pipe upgrade. Replacement of existing older pipes to better convey stormwater to existing infrastructure leading to Tumblin Creek.	Stormwater System Rehabilitation	Underway	TBD	N/A	N/A	Tumblin Creek Basin	N/A	$300,000	N/A	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A

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City of Gainesville	N/A	TUM27	Tumblin Creek Northwest (NW) 14th Street Pipe Upgrade	Tumblin Creek Watershed. stormwater pipe upgrade. Replacement of existing older pipes to better convey stormwater to existing infrastructure leading to Tumblin Creek.	Stormwater System Rehabilitation	Canceled	N/A	N/A	N/A	Tumblin Creek Basin	N/A	N/A	N/A	N/A	N/A	N/A
City of Gainesville	N/A	TUM28	Tumblin Creek SW 7th Terrace Pipe Upgrade	Tumblin Creek Watershed. Stormwater pipe upgrade. Replacement of existing older pipes to better convey stormwater to headwaters of Tumblin Creek.	Stormwater System Rehabilitation	Canceled	N/A	N/A	N/A	Tumblin Creek Basin	N/A	N/A	N/A	N/A	N/A	N/A
City of Gainesville	N/A	TUM29	Tumblin Creek SW 14th Avenue Underpass Improvements	Tumblin Creek watershed. Underpass upgrade. ReplaceWent and upgrade to an existing underpass for Tumblin Creek to prevent upstream flooding and erosion control.	Stormwater System Rehabilitation	Canceled	N/A	N/A	N/A	Tumblin Creek Basin	N/A	N/A	N/A	N/A	N/A	N/A
City of Gainesville	N/A	TUM30	Tumblin Creek SW 9th Street Underpass Improvements	Tumblin Creek Watershed. Underpass upgrade. Replacement and upgrade to an existing underpass for Tumblin Creek to prevent upstream flooding and erosion control.	Stormwater System Rehabilitation	Canceled	N/A	N/A	N/A	Tumblin Creek Basin	N/A	N/A	N/A	N/A	N/A	N/A
City of Gainesville	N/A	TUM31	Tumblin Creek PK Yonge Underpass Improvements	Tumblin Creek Watershed. underpass upgrade. Replacement and upgrade to an existing underpass for Tumblin Creek to prevent upstream flooding and erosion control.	Stormwater System Rehabilitation	Canceled	N/A	N/A	N/A	Tumblin Creek Basin	N/A	N/A	N/A	N/A	N/A	N/A
City of Gainesville	N/A	TUM32	Tumblin Creek Erosion Control and Stream Restoration	Tumblin Creek Watershed. Creek restoration. Upgrade problematic areas along Tumblin Creek for erosion control and stream restoration.	Stormwater System Rehabilitation	Canceled	N/A	N/A	N/A	Tumblin Creek Basin	N/A	N/A	N/A	N/A	N/A	N/A
City of Gainesville	N/A	TUM33	Tumblin Creek Sediment and Trash Trap Maintenance	Tumblin Creek Watershed stormwater sediment and trash trap maintenance.	Sediment Trap	Completed	2018	1,274	3,140	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	Not provided	N/A	$164,765	City of Gainesville Stormwater Management Utility Fee	$164,765	N/A
City of Gainesville	N/A	URBAN01-HOG	Street Sweeping	Street sweeping Hogtown.	Street Sweeping	Completed	N/A	125	80	Hogtown Creek Basin	N/A	N/A	$166,667	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN01-NEW	Street Sweeping	Street sweeping Newnans.	Street Sweeping	Completed	N/A	32	20	Newnans Lake Basin	N/A	N/A	$166,667	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A

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City of Gainesville	N/A	URBAN01-SWT	Street Sweeping	Street sweeping Sweetwater.	Street Sweeping	Completed	N/A	50	32	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	$166,667	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	UF/ Florida Stormwater Association (FSA)	URBAN07	Assessment Tool for MS4 Pollutant Load Reduction	UF study to determine load reductions for MS4 operations. Load reductions will be determined for baffle boxes and street sweeping.	Study	Completed	2007	N/A	N/A	Orange Creek Basin	N/A	$13,000	N/A	FSA	Not provided	N/A
City of Gainesville	Alachua County/ FDOT District 2	URBAN13	Gainesville Urban Area Storm Sewer Geodatabase	Gainesville urban area storm sewer geodatabase.	Study	Completed	2017	N/A	N/A	Orange Creek Basin	N/A	$2,040,000	N/A	Gainesville Clean Water Partnership (City of Gainesville/ Alachua County/ FDOT District 2)	Not provided	N/A
City of Gainesville	N/A	URBAN14-HOG	Ditch Maintenance	Ditch maintenance, Hogtown.	BMP Cleanout	Completed	N/A	1,165	472	Hogtown Creek Basin	N/A	N/A	$32,000	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN14-NEW	Ditch Maintenance	Ditch maintenance, Newnans.	BMP Cleanout	Completed	N/A	306	124	Newnans Lake Basin	N/A	N/A	$32,000	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN14-SWT	Ditch Maintenance	Ditch maintenance, Sweetwater.	BMP Cleanout	Completed	N/A	436	177	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	$32,000	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN15-HOG	Storm Drain Cleaning	Storm drain cleaning, Hogtown.	BMP Cleanout	Completed	N/A	42	26	Hogtown Creek Basin	N/A	N/A	$9,000	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN15-NEW	Storm Drain Cleaning	Storm drain cleaning, Newnans.	BMP Cleanout	Completed	N/A	11	7	Newnans Lake Basin	N/A	N/A	$9,000	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A

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City of Gainesville	N/A	URBAN15-SWT	Storm Drain Cleaning	Storm drain cleaning, Sweetwater.	BMP Cleanout	Completed	N/A	16	10	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	$9,000	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN16-HOG	Stormwater Pond Maintenance	Stormwater pond maintenance, Hogtown.	BMP Cleanout	Completed	N/A	122	49	Hogtown Creek Basin	N/A	N/A	$15,333	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN16-NEW	Stormwater Pond Maintenance	Stormwater pond maintenance, Newnans.	BMP Cleanout	Completed	N/A	32	13	Newnans Lake Basin	N/A	N/A	$15,333	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	URBAN16-SWT	Stormwater Pond Maintenance	Stormwater pond maintenance, Sweetwater.	BMP Cleanout	Completed	N/A	46	18	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	$15,333	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	UF/Florida Stormwater Association (FSA)	URBAN17	Assessment Took for MS4 Pollutant Load Reduction Update	Update of UF study to determine load reductions for MS4 operations. Load reductions determined for BMPs and street sweeping.	Study	Completed	2018	N/A	N/A	Orange Creek Basin	N/A	$0	N/A	City of Gainesville General Fund, City of Gainesville Stormwater Management Utility Fee/ In-kind staff hours	Not provided	N/A
City of Gainesville	N/A	GV01-NEW	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	294	33	Newnans Lake Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided
City of Gainesville	N/A	GV01-AS	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	884	TBD	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided

Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Location	Acres Treated	Cost Estimate	Cost Annual O&M	Funding Source	Funding Amount	DEP Contract Agreement Number
City of Gainesville	SJRWMD/ ACOE	HOG17	Fluvial Geomorphologic Assessment and Preliminary Restoration Plan	Northwest Gainesville. Study to determine source of excessive sedimentation in Hogtown Creek and is first step to develop preliminary plan to stabilize creek system.	Study	Completed	2003	N/A	N/A	Hogtown Creek Basin	N/A	$107,200	N/A	206 USACE Program/ SJRWMD Cost-Share Grant/ City of Gainesville Stormwater Management Utility	Not provided	N/A
City of Gainesville	FEMA	HOG19	Sediment Removal	NW 8th Ave. Removal of excessive sediment at bridge. Benefits by reducing sediment being deposited in Loblolly floodplain.	Muck Removal/Restoration Dredging	Completed	2005	N/A	N/A	Hogtown Creek Basin	N/A	$280,000	N/A	City of Gainesville Stormwater Management Utility Fee/ FEMA	Not provided	N/A
City of Gainesville	N/A	HOG29	Hydrodynamic Separator Number 4	Hydrodynamic Separator HOG29.	Hydrodynamic Separators	Completed	2018	7	3	Hogtown Creek Basin	5.5	$11,410	$3,500	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	HOG30	Hydrodynamic Separator Number 6	Hydrodynamic Separator HOG30.	Hydrodynamic Separators	Completed	2018	6	2	Hogtown Creek Basin	4.5	$29,211	$3,500	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	N/A	HOG31	Hydrodynamic Separator Number 7	Hydrodynamic Separator HOG31.	Hydrodynamic Separators	Completed	2018	72	29	Hogtown Creek Basin	55.5	$62,728	$3,500	City of Gainesville Stormwater Management Utility Fee	Not provided	N/A
City of Gainesville	EPA/SJRWMD	URBAN02	Hydrodynamic Separator Number 1	Hydrodynamic separator Sweetwater URBAN02.	Baffle Boxes-2nd Generation	Completed	N/A	15	6	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$26,260	$3,500	City of Gainesville Stormwater Management Utility Fee/ EPA Grant/ SJRWMD	Not provided	N/A
City of Gainesville	EPA/SJRWMD	URBAN03	Hydrodynamic Separator Number 2	Hydrodynamic separator Sweetwater URBAN03.	Hydrodynamic Separators	Completed	N/A	11	5	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$25,200	$3,500	City of Gainesville Stormwater Management Utility Fee/ EPA Grant/ SJRWMD	Not provided	N/A

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City of Gainesville	EPA/SJRWMD	URBAN09	Hydrodynamic Separator Number 3	Hydrodynamic separator Sweetwater URBAN09.	Hydrodynamic Separators	Completed	2018	13	5	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$11,410	$3,500	City of Gainesville Stormwater Management Utility Fee/ EPA Grant/ SJRWMD	Not provided	N/A
City of Gainesville	EPA/SJRWMD	URBAN10	Hydrodynamic Separator Number 5	Hydrodynamic separator Sweetwater URBAN10.	Hydrodynamic Separators	Completed	2018	26	11	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$145,180	$3,500	City of Gainesville Stormwater Management Utility Fee/ EPA Grant/ SJRWMD	Not provided	N/A
City of Hawthorne	N/A	HAWTHORNE01-LOCH	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	105	12	Lochloosa Lake Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided
City of Waldo	N/A	WALDO01-NEW	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	10	1	Newnans Lake Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided
DEP	Not provided	LOCH07	Groundwater-Surface Water Interaction Study Lochloosa Lake Area, Alachua and Marion Counties, Florida	Study of groundwater pathways for nutrients to enter Lochloosa and Orange Lakes. Field investigation determined levels of TP and TN in different aquifers land use categories. Radon studies estimated groundwater seepage into Lochloosa Lake.	Study	Completed	2007	N/A	N/A	Orange Lake and Lochloosa Lake Basins	N/A	$64,000	N/A	Federal Funds	Not provided	N/A
DEP	N/A	NEW08	Groundwater-Surface Water Interactions Study,Newnans Lake	Newnans Lake Watershed. Study examined groundwater pathways through which nutrients enter Newnans Lake. Improve understanding of groundwater's role in contributing nutrients to lake.	Study	Completed	2008	N/A	N/A	Newnans Lake Basin	N/A	$7,500	N/A	Not provided	Not provided	N/A
DEP	DEP/ SJRWMD/ ACEPD	NEW18	Depth to Top of Hawthorn Formation Investigation	Boreholes drilled at 24 sites in watershed to measure depth from land surface to top of Hawthorn formation. Depth determined by both observation and gamma ray logging. Samples of phosphatic rock were analyzed for phosphate content.	Study	Completed	2010	N/A	N/A	Newnans Lake Basin	N/A	$5,000	N/A	Federal Funds	Not provided	N/A

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DEP	Sustainable Alachua County/ City of Gainesville/ Alachua County/ GRU	OCB01	Community Based Social Marketing Workshop	Orange Creek Basin. Three-day workshop composed of 1-day Introductory Workshop and 2-day Advanced Workshop to teach principles of social marketing and how to foster sustainable behavior.	Education Efforts	Completed	2007	N/A	N/A	Orange Creek Basin	N/A	$25,000	N/A	U.S. Environmental Protection Agency (EPA) Section 319 Federal Funds/ Local Support	$15,000	Not provided
Florida Department of Agriculture and Consumer Services (FDACS)	Private Landowners	NUTRIENT 06	Cow/Calf BMPs	Marion County primarily; Alachua County. Cow/Calf BMP implementation and effectiveness verification.	Agricultural BMPs	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	General Inspection Trust Fund	Not provided	N/A
FDACS	Private Landowners	NUTRIENT 07	Container Nursery BMPs	Marion County primarily; Alachua County. Container Nursery BMP implementation and effectiveness verification. BMP manual adopted by FDACS rule. However, number of container nursery operations in this basin is minimal.	Agricultural BMPs	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	General Inspection Trust Fund	Not provided	N/A
FDACS	Private Landowners	NUTRIENT 08	Sod BMPs	Marion County primarily; Alachua County. Sod operation BMP implementation and effectiveness verification. Sod farm acreage in this basin is minimal.	Agricultural BMPs	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	General Inspection Trust Fund	Not provided	N/A
FDACS	Private Landowners	OR05	Vegetable and Agronomic Crop BMPs	Marion County primarily; Alachua County. Row Crop BMP implementation and effectiveness verification. BMP Manual adopted by FDACS rule. However, row crop acreage in this basin is minimal.	Agricultural BMPs	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	General Inspection Trust Fund	Not provided	N/A
FDACS	Private Landowners	OR06	Equine BMPs	Marion County primarily; Alachua County. Horse Farm BMP implementation and effectiveness verification.	Agricultural BMPs	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	General Inspection Trust Fund	Not provided	N/A
FDACS	Private Landowners	OR07	Specialty Fruit	Alachua County; Marion County. Specialty Fruit and Nut BMP implementation and effectiveness verification. BMP manual adopted by FDACS rule in May 2011.	Agricultural BMPs	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	General Inspection Trust Fund	Not provided	N/A

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FDACS-Florida Forest Service	Private Landowners	NUTRIENT 03	Silviculture BMP Implementation and Compliance	Silviculture BMPs are applied to industrial, public, and private forestlands. Developed in 1970s as minimum standards for protecting water quality on ongoing forestry activities. Projects include surveys, training, and technical assistance.	Agricultural BMPs	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	General Inspection Trust Fund	Not provided	N/A
FDOT District 2	N/A	FDOT02-LOCH	Education Outreach	Lochloosa Lake Basin state roads and rights-of-way. Education outreach.	Education Efforts	Completed	N/A	202	20	Lochloosa Lake Basin	N/A	N/A	Not provided	Florida Legislature	N/A	N/A
FDOT District 2	N/A	FDOT02-NEW	Education Outreach	Newnans Lake Basin state roads and rights-of-way. Education outreach.	Education Efforts	Completed	N/A	42	4	Newnans Lake Basin	N/A	N/A	Not provided	Florida Legislature	N/A	N/A
FDOT District 2	N/A	FDOT02-ORANGE	Education Outreach	Orange Lake Basin state roads and rights-of-way. Education outreach.	Education Efforts	Completed	N/A	N/A	1	Orange Lake Basin	N/A	N/A	Not provided	Florida Legislature	N/A	N/A
FDOT District 2	N/A	HOG18	Sediment Removal	NW 34th St. and University Ave. Removal of excessive sediment at bridges. Construction of 4 sediment sump compartments per management plan. Reduces sediment being deposited in Sugarfoot Prairie.	Muck Removal/ Restoration Dredging	Completed	2005	Not provided	Not provided	Hogtown Creek Basin	N/A	$2,374,166	$108,000	Florida Legislature	Not provided	N/A
FDOT District 2	N/A	HOG20	39th Avenue Basin Rehabilitation	NW 39th Ave from I-75 to airport. Dry retention pond modified to function as wet detention pond. Design modification needed to address high water table. Reduces sediment load and nutrient loads.	Wet Detention Pond	Completed	2004	514	140	Hogtown Creek Basin	Not provided	$1,432,976	Not provided	Florida Legislature	Not provided	N/A
FDOT District 2	N/A	HOG21	Widening of SR 26A	Urban Gainesville Area. Widening of SR 26A with new stormwater runoff treatment. Pollutant removal by treatment of stormwater runoff from SR 26A. Addition of dry detention pond for treatment of stormwater runoff.	Dry Detention Pond	Completed	2006	63	28	Hogtown Creek Basin	15	$3,982,382	Not provided	Florida Legislature	Not provided	N/A
FDOT District 2	N/A	LOCH04	Widening of SR 20 from 2 Lane to 4 Lane	Eastern urban area of Gainesville and Alachua County. Widening of SR 20 from 2-lane to 4-lane road with treatment. Three wet detention ponds installed to treat stormwater runoff along with more than 100 ditch blocks to capture runoff.	Wet Detention Pond	Completed	2006	1,450	136	Lochloosa Lake Basin	355	$10,763,788	Not provided	Florida Legislature	Not provided	N/A

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FDOT District 2	N/A	LOCH12	FDOT Fertilizer Cessation–Lochloosa	State-maintained roadways and rights-of-way. Routine fertilizer use was stopped to reduce nutrient loading in stormwater runoff from state-maintained roadways. Eliminates historical practice of fertilizing 15-foot strip adjacent to paved surface.	Fertilizer Cessation	Completed	N/A	3,310	666	Lochloosa Lake Basin	190	N/A	N/A	Florida Legislature	N/A	N/A
FDOT District 2	N/A	NEW04	Widening of SR 20 from 2 Lane to 4 Lane	Eastern urban area of Gainesville and Alachua County. Widening of SR 20 from 2-lane to 4-lane road with treatment. Three wet detention ponds installed to treat stormwater runoff along with more than 100 ditch blocks to capture runoff.	Grass swales with swale blocks or raised culverts	Completed	2006	2,005	198	Newnans Lake Basin	355	N/A	Not provided	Florida Legislature	Funded with Project LOCH04	N/A
FDOT District 2	N/A	NEW38	FDOT Fertilizer Cessation–Newnans	State-maintained roadways and rights-of-way. Routine fertilizer use was stopped to reduce nutrient loading in stormwater runoff from state-maintained roadways. Eliminates historical practice of fertilizing 15-foot strip adjacent to paved surface.	Fertilizer Cessation	Completed	N/A	1,285	248	Newnans Lake Basin	59	N/A	N/A	Florida Legislature	N/A	N/A
FDOT District 2	N/A	OR22	FDOT Fertilizer Cessation–Orange	State-maintained roadways and rights-of-way. Routine fertilizer use was stopped to reduce nutrient loading in stormwater runoff from state-maintained roadways. Eliminates historical practice of fertilizing 15-foot strip adjacent to paved surface.	Fertilizer Cessation	Completed	N/A	257	54	Orange Lake Basin	12	N/A	N/A	Florida Legislature	N/A	N/A
FDOT District 2	N/A	URBAN04-HOG	State Roads Street Sweeping	Urban Area Hogtown Creek Basin. Street sweeping of state roads in urbanized areas that have curb and gutter. Includes US 441, SR 26, SR 20, SR 24, SR 128, SR 222, and SR 121.	Street Sweeping	Completed	N/A	222	142	Hogtown Creek Basin	N/A	N/A	Not provided	Florida Legislature	Not provided	N/A
FDOT District 2	N/A	URBAN04-NEW	State Roads Street Sweeping	Urban Area Newnans Lake Basin. Street sweeping of state roads in urbanized areas that have curb and gutter. Includes US 441, SR 26, SR 20, SR 24, SR 128, SR 222, and SR 121.	Street Sweeping	Completed	N/A	124	79	Newnans Lake Basin	N/A	N/A	Not provided	Florida Legislature	Not provided	N/A

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FDOT District 2	N/A	URBAN04-SWT	State Roads Street Sweeping	Urban Area Paynes Prairie Basin. Street sweeping of state roads in urbanized areas that have curb and gutter. Includes US 441, SR 26, SR 20, SR 24, SR 128, SR 222, and SR 121.	Street Sweeping	Completed	N/A	76	48	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	N/A	Not provided	Florida Legislature	Not provided	N/A
FDOT District 2	Alachua County/ City of Gainesville	URBAN11	FDOT Storm Sewer Geodatabase–Alachua County	Alachua County. Maintain comprehensive geodatabase for FDOT-related storm sewer system data in Alachua County. Coordinate with COG and AC Public Works for data compatibility.	Monitoring/Data Collection	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$272,375	N/A	Florida Legislature	Not provided	N/A
FDOT District 2	N/A	WAU02	FDOT Fertilizer Cessation–Wauberg	State-maintained roadways and rights-of-way. Routine fertilizer use was stopped to reduce nutrient loading in stormwater runoff from state-maintained roadways. Eliminates historical practice of fertilizing 15-foot strip adjacent to paved surface.	Fertilizer Cessation	Completed	N/A	164	34	Lake Wauberg Basin	8	N/A	N/A	Florida Legislature	N/A	N/A
FDOT District 5	N/A	OR26	Fertilizer Cessation	District 5 maintained roads within Orange Creek Basin BMAP limits (SR 200, SR 25).	Fertilizer Cessation	Completed	N/A	2,707	2,707	Orange Lake Basin	187	N/A	N/A	Florida Legislature	N/A	N/A
FDOT District 5	N/A	OR27	Swales	District 5–maintained roads within Orange Creek Basin BMAP limits (I-75, SR 200, SR 25). Swale systems capture runoff and enhance infiltration.	Grass swales without swale blocks or raised culverts	Completed	Not provided	1,691	227	Orange Lake Basin	842	Not provided	Not provided	Florida Legislature	Not provided	N/A
FDOT District 5	N/A	FDOT05-ORANGE	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	N/A	1	Orange Lake Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided
FWC	N/A	AS19	Paynes Prairie Exotic Plant Control	Paynes Prairie. Control of exotic plants including *Triadica sebifera*, *Melia azedarach*, and *Colocasia esculenta* on 250 acres. Enhance success of native plants.	Exotic Vegetation Removal	Completed	2013	N/A	N/A	Paynes Prairie Basin	250	$15,285	N/A	FWC	$15,285	N/A
FWC	N/A	LOCH08	Lochloosa Lake Annual Aquatic Plant Maintenance Program	Lochloosa Lake. Annual maintenance program for control of non-native species hydrilla, water hyacinth, wild taro, and water lettuce. Protects native plant communities and reduces organic muck buildup from growth of exotic species.	Exotic Vegetation Removal	Completed	N/A	N/A	N/A	Lochloosa Lake Basin	5,075	N/A	$20,000	FWC/IPM Cooperative Aquatic Plant Management Program	Not provided	N/A

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FWC	N/A	LOCH10	Littoral Zone Planting 2009	Lochloosa Lake littoral zone planting of 5,000 *Paspalidium geminatum* and 5,000 *Schoenoplectus californicus*. Enhance aquatic habitat, stabilize bottom, and reduce resuspension of sediment.	Shoreline Stabilization	Completed	2009	N/A	N/A	Lochloosa Lake Basin	N/A	$3,750	N/A	FWC	$3,750	N/A
FWC	N/A	LOCH11	Cross Creek Exotic Plant Control	Cross Creek. Removal of exotic trees including *Triadica sebifera*. Improves aquatic habitat.	Exotic Vegetation Removal	Completed	2011	N/A	N/A	Lochloosa Lake Basin	N/A	$6,082	N/A	FWC	$6,082	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	NEW11	Newnans Lake Planting-Fiscal Year (FY) 2005–06	Newnans Lake east shore, south of Windsor ramp. Transplant 90,000 maidencane, knotgrass and giant bulrush plants (30,000 of each species) in areas where littoral habitat is sparse.	Shoreline Stabilization	Completed	2006	N/A	N/A	Newnans Lake Basin	N/A	$19,500	N/A	FWC	$19,500	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	NEW12	Newnans Lake Planting-FY 2006–07	Newnans Lake east shore, south of Windsor ramp. Transplant 20,000 maidencane, 20,000 knotgrass, and 10,000 giant bulrush plants in areas where littoral habitat is sparse.	Shoreline Stabilization	Completed	2007	N/A	N/A	Newnans Lake Basin	N/A	$11,000	N/A	FWC	$11,000	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	NEW13	Newnans Lake Herbicide	Newnans Lake east shore, near Windsor ramp. Herbicide control of tussocks (pennywort, *Scirpus cubensis*, cupscale). FWC removed dense mats of herbaceous tussock to promote establishment of beneficial SAV and rooted emergent species.	Aquatic Vegetation Harvesting	Completed	2006	N/A	N/A	Newnans Lake Basin	15	$1,000	N/A	FWC	$1,000	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	NEW14	Newnans Lake Planting-FY 2007–08	Newnans Lake east shore. Transplant 20,000 maidencane, 30,000 knotgrass, and 20,000 giant bulrush plants in areas where littoral habitat is sparse. Promotes establishment of beneficial vegetation in areas where habitat is sparse.	Shoreline Stabilization	Completed	2008	N/A	N/A	Newnans Lake Basin	N/A	$21,000	N/A	FWC	$21,000	N/A
FWC	N/A	NEW15	Newnans Lake Annual Aquatic Plant Maintenance Program	Newnans Lake, Alachua County. Annual herbicide maintenance program for control of non-native species hydrilla, water hyacinth, and water lettuce. Protects native plant communities and reduces organic muck buildup from growth of exotic species.	Exotic Vegetation Removal	Completed	N/A	N/A	N/A	Newnans Lake Basin	N/A	N/A	$5,000	FWC/IPM Cooperative Aquatic Plant Management Program	N/A	N/A
FWC	N/A	NEW24	Littoral Zone Planting 2008	Newnans Lake. Planting of 5,000 *Paspalidium geminatum* and 3,000 *Schoenoplectus californicus*.	Shoreline Stabilization	Completed	2008	N/A	N/A	Newnans Lake Basin	N/A	$3,000	N/A	FWC	$3,000	N/A

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FWC	N/A	NEW25	Littoral Zone Planting 2009	Newnans Lake. Planting of 7,500 *Paspalidium geminatum*.	Shoreline Stabilization	Completed	2009	N/A	N/A	Newnans Lake Basin	N/A	$2,250	N/A	FWC	$2,250	N/A
FWC	N/A	NEW26	Littoral Zone Planting and Management 2011	Newnans Lake planting of 5,000 *Paspalidium geminatum* and management with herbicide of planting sites for pickerel weed and cupscale tussocks in habitat enhancement areas.	Shoreline Stabilization	Completed	2011	N/A	N/A	Newnans Lake Basin	N/A	$1,900	N/A	FWC	$1,900	N/A
FWC	N/A	NEW27	Littoral Zone Planting 2012	Newnans Lake planting of 6,000 *Paspalidium geminatum*.	Shoreline Stabilization	Completed	2012	N/A	N/A	Newnans Lake Basin	N/A	$2,280	N/A	FWC	$2,280	N/A
FWC	N/A	OR11	Orange Lake Mechanical Scraping	Selected areas of Orange Lake. Mechanical scraping of muck from selected areas of Orange Lake. Muck disposed of upland or deposited on in-lake island. Restores fish spawning substrate.	Muck Removal/Restoration Dredging	Completed	2002	N/A	N/A	Orange Lake Basin	N/A	$648,403	N/A	FWC	$648,403	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	OR12	Orange Lake Frog's-bit Control	Northern sections of Orange Lake. Herbicide control of floating mats of frog's-bit in northern sections of Orange Lake. Restores deep marsh habitat.	Exotic Vegetation Removal	Completed	2005	N/A	N/A	Orange Lake Basin	N/A	$31,500	N/A	FWC	$31,500	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	OR13	Orange Lake Tussock Control	Northern sections of Orange Lake. Mechanical shredding of tussocks in north portion of Orange Lake. Mechanically shred acres of tussocks. Restores deep marsh habitat.	Aquatic Vegetation Harvesting	Completed	2005	N/A	N/A	Orange Lake Basin	N/A	$146,057	N/A	FWC	$146,057	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	OR14	Orange Lake Tussock Harvesting	Essen Run, southeast section of Orange Lake. Mechanical harvesting of tussocks from Essen Run area of Orange Lake. Harvest 36 acres of tussocks from Orange Lake with upland disposal. Restores deep marsh habitat.	Aquatic Vegetation Harvesting	Completed	2005	N/A	N/A	Orange Lake Basin	36	$346,500	N/A	FWC	$346,500	N/A
FWC	DEP Cooperative Aquatic Plant Management Program	OR15	Orange Lake Floating Tussock Control	Orange Lake. Control of floating tussocks by shredding. Provides for restoration of deep marsh habitat, protection of established emergent vegetation, and navigation. Improves fish and wildlife habitat and public recreation and navigation.	Aquatic Vegetation Harvesting	Completed	2005	N/A	N/A	Orange Lake Basin	N/A	$2,252,000	N/A	DEP Cooperative Aquatic Plant Management Program	Not provided	N/A

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FWC	N/A	OR16	Orange Lake Annual Aquatic Plant Maintenance Program	Orange Lake. Annual maintenance program for control of non-native species hydrilla, water hyacinth, wild taro, and water lettuce. Protects native plant communities and reduces organic muck buildup from growth of exotic species.	Exotic Vegetation Removal	Completed	N/A	N/A	N/A	Orange Lake Basin	N/A	N/A	$30,000	FWC/IPM Cooperative Aquatic Plant Management Program	Not provided	N/A
FWC	ACEPD/ Two Private Landowners	OR17	Cypress Strand Planting	Orange Lake-Essen Run. Total of 1,500 bald cypress, 300 red maple and 200 Carolina ash were planted at 2 sites totaling 3.5 acres. Stabilizes shoreline and provides forested wetland fish and wildlife habitat.	Shoreline Stabilization	Completed	2009	N/A	N/A	Orange Lake Basin	3.5	$7,109	N/A	FWC/ ACEPD and Marion County Provided In-kind Services	$7,109	N/A
FWC	N/A	OR18	Planting of Wetland Trees	Planting of 175 trees comprising *Taxodium distichum*, *Nyssa sylvatica*, and *Fraxinus caroliniana* in littoral zone of Orange Lake. Stabilizes shoreline and provides forested wetland fish and wildlife habitat. Also provides vegetated buffer to adjacent upland.	Shoreline Stabilization	Completed	2012	N/A	N/A	Orange Lake Basin	N/A	$1,225	N/A	FWC	$1,225	N/A
FWC	N/A	OR19	Exotic Tree Control	Removal of exotic trees from littoral zone of Orange Lak,e including *Triadica sebifera* and *Melia azedarach*. Stabilizes shoreline and provides forested wetland fish and wildlife habitat. Also provides vegetated buffer to adjacent upland.	Exotic Vegetation Removal	Completed	2011	N/A	N/A	Orange Lake Basin	N/A	$6,082	N/A	FWC	$6,082	N/A
FWC	Orange Lake Association	OR20	Orange Lake-Essen Run Deep Marsh Restoration	Orange Lake-Essen Run. Removal of dense floating vegetation and organic sediment (tussocks) to improve dissolved oxygen and restore deep marsh/SAV habitat types. Direct removal of nutrients associated with aquatic plants and organic sediment.	Wetland Restoration	Completed	2016	N/A	N/A	Orange Lake Basin	N/A	$490,523	N/A	FWC	$490,523	N/A
FWC	N/A	OR21	Orange Lake-Rookery Island Enhancement	Orange Lake. Mechanical shredding of tussocks from perimeter of colonial wading bird colonies to improve suitability of nesting habitat, improve dissolved oxygen in water column and allow sunlight to penetrate for SAV.	Wetland Restoration	Completed	2015	N/A	N/A	Orange Lake Basin	N/A	$205,000	N/A	FWC	$205,000	N/A
FWC	Orange Lake Association	OR24	Orange Lake / Cypress Island Shallow/Deep Marsh Restoration	Orange Lake landowner adjacent to site received cost-share grant from USFWS Partners for Wildlife Program to control woody shrub encroachment into herbaceous marsh zone during extended drawdown.	Wetland Restoration	Completed	2016	N/A	N/A	Orange Lake Basin	N/A	$120,000	N/A	FWC	$120,000	N/A

Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Location	Acres Treated	Cost Estimate	Cost Annual O&M	Funding Source	Funding Amount	DEP Contract Agreement Number
FWC	N/A	OR25	Establishing Corridors between Shallow and Deep Marsh for Fish and Wildlife and Public Access	Orange Lake. Reduce floating vegetation and dense shrub canopies to improve connectivity among ecotones from open water to near shore wetlands; improves dissolved oxygen concentrations.	Wetland Restoration	Completed	2016	N/A	N/A	Orange Lake Basin	N/A	$108,000	N/A	FWC	$108,000	N/A
FWC	N/A	OR28	Orange Lake Habitat Enhancement Site Maintenance	Orange Lake. Control dense plant growth and tussocks at sites where previous habitat enhancement work has been done. Maintain beneficial rooted emergent and submersed aquatic vegetation with good connectivity between limnetic and littoral habitats.	Wetland Restoration	Underway	N/A	N/A	N/A	Orange Lake Basin	N/A	$966,128 (2014–present)	N/A	FWC Aquatic Habitat Restoration and Enhancement Subsection Operations Budget	$966,128	N/A
FWC	N/A	OR29	Orange Lake Woody Shrub Management and Shallow Marsh Reclamation	Orange Lake. Restore shallow herbaceous marsh habitat by controlling encroachment of woody shrubs and tree covered tussocks from near-shore areas that historically supported rooted herbaceous vegetation and SAV.	Wetland Restoration	Underway	N/A	N/A	N/A	Orange Lake Basin	N/A	$330,000 (2016–present)	N/A	FWC Aquatic Habitat Restoration and Enhancement Subsection Operations Budget	$330,000	N/A
FWC	N/A	OR30	Orange Creek Basin Littoral Vegetation Mapping	Orange Creek Basin Lakes. Aerial photography and GIS analysis of wetland and aquatic vegetation coverage. Data used to assess habitat condition and determine management needs as prescribed by FWC Habitat Guidelines. Ongoing-recurs every 3 years.	Study	Underway	N/A	N/A	N/A	Orange Creek Basin	N/A	$225,000 (2010–present)	N/A	FWC Aquatic Habitat Restoration and Enhancement Subsection Operations Budget	$225,000	N/A
GRU	SJRWMD	AS03	Main Street Water Reclamation Facility Reuse System	Main Street to Depot Avenue within boundaries of City of Gainesville. Design and construction of 4,910 foot 24-inch reclaimed water main from Main Street WRF to Depot Avenue.	WWTF Diversion to Reuse	Completed	2002	Not provided	Not provided	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$587,288	N/A	SJRWMD/ GRU Ratepayers	SJRWMD–$100,000/ GRU–$487,288	N/A
GRU	DEP Parks and Recreation/ City of Gainesville	AS05	Feasibility Analysis of Sweetwater Branch Sheet Flow Restoration Project at Paynes Prairie Preserve State Park, Alachua County, Florida	Sweetwater Branch at Paynes Prairie. Assess technical and economic feasibility of restoring historic sheet flow by diverting flow from Alachua Sink. Determine allowable nutrient concentrations and loading to Paynes Prairie.	Study	Completed	2006	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$25,000	N/A	City of Gainesville Public Works/ GRU/ DEP Parks and Recreation	City of Gainesville Public Works, GRU, DEP Parks and Recreation Each Paid 1/3 of Cost	N/A

Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Location	Acres Treated	Cost Estimate	Cost Annual O&M	Funding Source	Funding Amount	DEP Contract Agreement Number
GRU	N/A	AS10	Main Street Water Reclamation Facility Future Water Reuse	City of Gainesville. Design, permitting, and construction of upgrades for delivering public access to reclaimed water from Main Street WRF.	WWTF Diversion to Reuse	Completed	2007	Not provided	Not provided	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$1,548,000	N/A	GRU Ratepayers	Not provided	N/A
GRU	N/A	AS11	Alachua Sink Intensive Study and Main Street Water Reclamation Facility Water Reuse Feasibility	Alachua Sink/Sweetwater Branch. Intensive water quality study to provide better understanding of nutrient loading to Alachua Sink and evaluation of modeling used in TMDL and to determine reuse feasibility.	Monitoring/Data Collection	Completed	2008	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$565,519	N/A	GRU Ratepayers	Not provided	N/A
GRU	N/A	AS13	GRU Reclaimed Water Master Plan	City of Gainesville and Alachua County. Strategic planning effort to evaluate future reclaimed water alternatives that will impact options for meeting TMDL. Expanded reuse will reduce nutrient loading to Alachua Sink.	Study	Completed	2007	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$130,106	N/A	GRU Ratepayers	Not provided	N/A
GRU	City of Gainesville/ DEP Division of Parks and Recreation/ SJRWMD	AS15	Paynes Prairie Sheet Flow Restoration Conceptual Plan	Paynes Prairie. Develop conceptual plan and estimate of costs for proposed Paynes Prairie Restoration Project. Project to proceed with approval of all regulatory agencies. Provides plan to meet TMDL through cooperative treatment alternatives.	Study	Completed	2007	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	2,112	$29,500	N/A	GRU/ City of Gainesville	Not provided	N/A
GRU	N/A	AS16	Paynes Prairie Sheetflow Restoration Evaluation of Main Street Water Reclamation Facility Upgrades	Paynes Prairie. Evaluate Main Street WRF treatment options and off-line wetland performance and sizing in conjunction with proposed Paynes Prairie Sheetflow Restoration Project.	WWTF Upgrade	Completed	2007	Not provided	22,671	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$2,002,632	N/A	GRU Ratepayers	Not provided	N/A

Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Location	Acres Treated	Cost Estimate	Cost Annual O&M	Funding Source	Funding Amount	DEP Contract Agreement Number
GRU	City of Gainesville/ Alachua County/ FDOT	AS18	Paynes Prairie Sheetflow Restoration Project	Paynes Prairie Sheetflow Restoration Project is 125-acre off-line wetland that reduces excess nutrients from Sweetwater Branch and achieves TMDL reduction required for City's (wastewater and stormwater utilities) for Alachua Sink.	Hydrologic Restoration	Completed	2014	125,106	3,359	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	2,130	$23,300,000	$95,785	Stormwater Utility and Wastewater Fees/ Florida Legislature/ SJRWMD/ FDOT/ TMDL/ FWC/ Recreational Trails; O&M Costs $3,183,286 FY2015 and $95,785 FY2016	Stormwater Utility and Wastewater Fees– $16,357,745/ Florida Legislature –$500,000/ SJRWMD– $1,355,869/ FDOT– $666,000/ 319 TMDL– $2,506,270/ FWC– $500,000/Recreational Trails– $200,001	N/A
GRU	N/A	BACTERIA 05	Microbial Source Tracking (MST) Study	Gainesville urban creeks within GRU wastewater collection system service area (115 square miles). MST study to better understand relative contributions of various sources of fecal pollution in creeks.	Monitoring/Data Collection	Completed	2007	N/A	N/A	Tumblin Creek, Sweetwater Branch, and Hogtown Creek Basins	N/A	$419,000	N/A	GRU Ratepayers	Not provided	N/A
GRU	N/A	BACTERIA 07	Inflow and Infiltration Project–Phases I, II and III/ Ongoing Work	GRU wastewater collection system service area (115 square miles) including urban creek watersheds. I&I Project.	Sanitary Sewer and Wastewater Treatment Facility (WWTF) Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$4,674,464	Not provided	GRU Ratepayers	Not provided	N/A
GRU	N/A	BACTERIA 08	Slip Lining Projects	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. Trenchless restoration of City of Gainesville's wastewater collection system through slip lining.	Sanitary Sewer and WWTF Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$10,584,678	Not provided	GRU Ratepayers	Not provided	N/A

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GRU	N/A	BACTERIA 09	GRU Lift Station Annual Operation and Maintenance	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. Maintenance of City of Gainesville's wastewater collection system to maintain system integrity of lift stations.	Sanitary Sewer and WWTF Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	Not provided	Not provided	GRU Ratepayers	Not provided	N/A
GRU	N/A	BACTERIA 10	GRU Wastewater System Capital Projects	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. Capital improvements to City of Gainesville wastewater treatment and collection system.	WWTF Upgrade	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$175,634,681	Not provided	GRU Ratepayers	Not provided	N/A
GRU	N/A	BACTERIA 11	GRU Wastewater Collection System Annual Rehabilitation and Replacement	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. Rehabilitation and replacement of City of Gainesville's wastewater collection system. Minimizes possibility of wastewater release.	Sanitary Sewer WWTF Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$27,950,162	Not provided	GRU Ratepayers	Not provided	N/A
GRU	N/A	BACTERIA 12	GRU Lift Station Rehabilitation and Replacement	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. Rehabilitation and replacement of City of Gainesville's wastewater collection system to maintain system integrity.	Sanitary Sewer and WWTF Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$12,519,563	Not provided	GRU Ratepayers	Not provided	N/A
GRU	N/A	BACTERIA 13	GRU Wastewater Collection System Annual Operation and Maintenance	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. GRU Wastewater Collection System Annual Operation and Maintenance to maintain system integrity. Minimizes possibility of wastewater release.	Sanitary Sewer and WWTF Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$28,389,156	Not provided	GRU Ratepayers	Not provided	N/A
GRU	N/A	BACTERIA 14	Water/ Wastewater Engineering Dept. Annual O&M Services	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. Water/wastewater Engineering Dept. executes5-year scheduling system for initiating and administrating wastewater capital projects.	Sanitary Sewer and WWTF Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$8,205,591	Not provided	GRU Ratepayers	Not provided	N/A

Lead Entity	Partners	Project Number	Project Name	Project Description	Project Type	Project Status	Estimated Completion Date	TN Reduction (lbs/yr)	TP Reduction (lbs/yr)	Location	Acres Treated	Cost Estimate	Cost Annual O&M	Funding Source	Funding Amount	DEP Contract Agreement Number
GRU	N/A	BACTERIA 15	GRU Wastewater Collection System Annual Service Lateral Rehabilitation and Replacement	GRU wastewater collection system service area (115 square miles), including urban creek watersheds. Rehabilitation and replacement of City of Gainesville's wastewater collection system, specifically service laterals and cleanouts.	Sanitary Sewer and WWTF Maintenance	Completed	N/A	Not provided	Not provided	Orange Creek Basin	N/A	$6,023,926	Not provided	GRU Ratepayers	Not provided	N/A
GRU	SJRWMD/ Homeowners	HOG32	Hogtown Creek Improvements	Abandon two creek side OSTDS (4029 & 4039 NW 8th Ave) and connect to GRUs sanitary sewer system to reduce fecal coliform and nutrient loading.	OSTDS Phase Out	Underway	2017	84	37	Hogtown Creek Basin	N/A	$32,000	N/A	GRU Connect Free Program/ SJRWMD Cost-Share Program/ Homeowner Contribution	Not provided	N/A
GRU	City of Gainesville/ RHP Properties/ SJRWMD/ DEP	NEW35	Eliminate nutrient load from Brittany Estates Wastewater Treatment Facility	Brittany Estates Mobile Home Park (5010 NE Waldo Road, Gainesville). Goal of project is to eliminate use of community's onsite wastewater treatment plant and its discharge to Little Hatchet Creek.	Study	Planned	TBD	N/A	N/A	Newnans Lake Basin	N/A	Not provided	N/A	Not provided	Not provided	N/A
GRU	N/A	NUTRIENT 02	Main Street Water Reclamation Facility Annual Operation and Maintenance	City of Gainesville. Alachua County. Maintenance to keep both water reclamation facilities in compliance with existing NPDES permit requirements. NPDES permit for domestic wastewater discharge. Maintain compliance with NPDES permit.	Sanitary Sewer and WWTF Maintenance	Completed	N/A	N/A	N/A	Orange Creek Basin	N/A	$75,045,594	N/A	GRU Ratepayers	Not provided	N/A
GRU	N/A	NUTRIENT 09	Main Street Water Reclamation Facility Phosphorus Removal Chemical Feed System	City of Gainesville. Alachua County. Maintenance to keep both water reclamation facilities in compliance with existing NPDES permit requirements. NPDES permit for domestic wastewater discharge. Maintain compliance with NPDES permit.	WWTF Upgrade	Completed	N/A	N/A	N/A	Sweetwater Branch, Paynes Prairie, and Alachua Sink Basin	N/A	$1,552,879	N/A	GRU Ratepayers	Not provided	N/A
GRU	N/A	TUM22	Tumblin Creek Pedestal Removal	Tumblin Creek. Removal of abandoned wastewater collection pipe pedestal in Tumblin Creek to reduce bank and bed scour. Removal of structure helps to control scouring of bank and bed. Reduces suspended solids in water column.	Sanitary Sewer and WWTF Maintenance	Completed	2005	Not provided	Not provided	Tumblin Creek Basin	N/A	$80,000	N/A	GRU Ratepayers	Not provided	N/A

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GRU	N/A	URBAN12	Sanitary Sewer System Geodatabase	Gainesville and environs (GRU Service Area). Maintain comprehensive geodatabase for all Gainesville Regional Utilities sanitary sewer system data.	Study	Completed	Not provided	N/A	N/A	Orange Creek Basin	N/A	Not provided	N/A	GRU Water and Wastewater Engineering O&M Budget	Not provided	N/A
Marion County	Marion County Planning Department/ Marion County Extension Service/ Marion County Soil and Water Conservation District/ SWFWMD	MARION01	Clean Farms Initiative	Marion County Orange Creek Basin. Clean Farms Initiative was originally passed under Resolution 04-R-384 and has evolved using Farm Outreach Coordinator to educate farms regarding BMPs. Number of farm visits is tracked yearly.	Agricultural BMPs	Completed	N/A	N/A	N/A	Orange Lake Basin	N/A	$55,000	N/A	Marion County Clean Water Assessment/ General Revenue/ SWFWMD Grant	Not provided	N/A
Marion County	N/A	MARION02	Marion County Aquifer Vulnerability Assessment (MCAVA)	Marion County Orange Creek Basin. MCAVA project provided scientifically defensible water-resource management and protection tool that uses map to show relative aquifer vulnerability for use in guiding growth.	Study	Completed	2007	N/A	N/A	Orange Lake Basin	N/A	$82,850	N/A	Marion County Clean Water Assessment	Not provided	N/A
Marion County	N/A	MARION03	Street Sweeping of Marion County Roads	Marion County portion of basin. Sweeping of Marion County–maintained roads in Orange Creek Basin. Sweeping is completed 9 times per year, currently 1.7 miles in this basin. Based on average load yield, this is roughly 10.3 cubic yards per year.	Street Sweeping	Cancelled	2015	N/A	N/A	Orange Lake Basin	N/A	N/A	$574	Marion County Clean Water Program	Not provided	N/A
Marion County	N/A	MARION04	Orange Creek Watershed Management Plan	Marion County OC Basin. Watershed Management Plan (WMP) was initiated and Floodplain Analysis was completed in 2014. Floodplain Level of Service, Surface Water Resource Assessment and Capital Projects Reports are still to be completed.	Study	Planned	TBD	N/A	N/A	Orange Lake Basin	N/A	TBD	N/A	Marion County Clean Water Assessment	TBD	N/A
Marion County	N/A	MARION05	Education Outreach	Orange Lake Basin. Education outreach activities in Marion County portion of Orange Lake Basin.	Education Efforts	Completed	N/A	N/A	31	Orange Lake Basin	N/A	N/A	Not provided	Marion County	Not provided	N/A

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Orange Creek Basin Partnership	SJRWMD/ Alachua County/ GRU/ City of Gainesville Public Works/ Paynes Prairie Preserve State Park	AS12	Paynes Prairie Vegetative Study	Paynes Prairie. Study determined if nutrients from Sweetwater Branch were correlated with herbaceous vegetation growth in Paynes Prairie. Study documented influence of urban surface water on natural systems.	Study	Completed	2002	N/A	N/A	Paynes Prairie Basin	N/A	$51,479	N/A	Not provided	Not provided	N/A
SJRWMD	N/A	LOCH01	Development PLRGs for Lochloosa Lake	Diagnostic studies, water quality data, and hydrologic models used to estimate target nutrient concentrations to meet water quality standards and nutrient load reductions to restore water quality. Assist DEP with development of TMDL.	Study	Canceled	N/A	N/A	N/A	Lochloosa Lake Basin	N/A	$1,000,000	N/A	SJRWMD Ad Valorem/ Water Management Lands Trust Fund/ Legislative Appropriations/ Ecosystems Management Trust Fund/ SWIM Fund	Not provided	N/A
SJRWMD	Brown's Farm	LOCH14	Brown's Farm Irrigation Conversion	Lochloosa Lake Basin (Sub-Basin 17). Irrigation conversion.	Agricultural BMPs	Completed	2016	296	75	Lochloosa Lake Basin	39	$122,569	N/A	SJRWMD	SJRWMD– $110,312	N/A
SJRWMD	Brown's Farm	LOCH15	Brown's Farm Irrigation Conversion	Lochloosa Lake Basin (Sub-Basin 23). Irrigation conversion.	Agricultural BMPs	Completed	2018	96	25	Lochloosa Lake Basin	50	$137,000	N/A	SJRWMD	SJRWMD– $102,750	N/A
SJRWMD	Brown's Farm	LOCH16	Brown's Farm Sprayer	Lochloosa Lake Basin (Sub-Basins 23 and 17). Sprayer with GPS guidance.	Agricultural BMPs	Completed	2018	208	82	Lochloosa Lake Basin	250	$13,450	N/A	SJRWMD	SJRWMD– $5,044/ DEP– $5,044	N/A
SJRWMD	Lochloosa Farm	LOCH17	Lochloosa Farm Soil Moisture Probes and Weather Stations	Lochloosa Lake Basin (Sub-Basins 20 and 21). Soil moisture probes and weather stations.	Agricultural BMPs	Underway	2019	6	3	Lochloosa Lake Basin	20	$19,840	N/A	SJRWMD	SJRWMD– $7,440/ DEP– $7,440	N/A

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SJRWMD	N/A	NEW01	Development of Pollutant Load Reduction Goals (PLRGs) for Newnans Lake	Newnans Lake Watershed. Development of science-based estimates of nutrient (N and/or P) external load reductions needed to restore lakes to state water quality standards.	Study	Completed	2009	N/A	N/A	Newnans Lake Basin	N/A	$1,000,000	N/A	SJRWMD Ad Valorem/ Water Management Lands Trust Fund/ Legislative Appropriations/ Ecosystems Management Trust Fund/ SWIM Fund	Not provided	N/A
SJRWMD	N/A	NEW02	Newnans Lake Conservation Area	Alachua County; land around north and east side of Newnans Lake. Purchase of lands near and around Newnans Lake for conservation and public use.	Land Acquisition	Completed	2001	N/A	N/A	Newnans Lake Basin	5,556	$5,727,400	N/A	Preservation 2000	Not provided	N/A
SJRWMD	N/A	NEW09	Nutrient Loading Estimation During Storm Event	Stormwater quality and discharge data collected from 5 tributaries in Newnans and Lochloosa Lakes Watersheds. Allowed District to revise HSPF hydrologic model and work with blueberry grower. Refine hydrologic nutrient loading models.	Study	Completed	2008	N/A	N/A	Newnans Lake Basin	N/A	$198,100	N/A	Florida Legislature	Not provided	N/A
SJRWMD	N/A	NEW10	Spatial Nutrient Loading Dynamics in the Newnans Lake Watershed	Data are collected representing spatial and temporal dynamics of nutrient pollutant loads in surface waters and groundwater in Newnans Lake Watershed. Refine HSPF hydrologic models, and work with Gainesville Regional Airport.	Study	Completed	2010	N/A	N/A	Newnans Lake Basin	N/A	$219,000	N/A	Legislative Appropriation/ Water Management Lands Trust Fund	Not provided	N/A
SJRWMD	N/A	NEW31	Harvest of Rough Fish (Gizzard Shad)	Newnans Lake. Harvest of rough fish, largely gizzard shad. Removal of fish helps to export TP load from lake. One year of 3-year project completed. 205,188 pounds of fish removed.	Fish Harvesting	Completed	2010	N/A	N/A	Newnans Lake Basin	N/A	Not provided	N/A	Not provided	Not provided	N/A
SJRWMD	North Caledonia	OC01	North Caledonia Tailwater Storage and Recovery, and Variable Rate Fertilizer Equipment	Tailwater storage and recovery, and variable rate fertilizer equipment.	Agricultural BMPs	Completed	2017	3,043	271	Orange Creek Basin	N/A	Not provided	N/A	SJRWMD	SJRWMD–$291,262	N/A
SJRWMD	Island Grove	OC02	Island Grove Irrigation System Automation	Irrigation system automation.	Agricultural BMPs	Completed	2018	425	62	Orange Creek Basin	N/A	Not provided	N/A	SJRWMD	SJRWMD–$152,610	N/A

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SJRWMD	Colvin Farms	OCB03	Colvin Farms Center Pivot Nozzle Retrofit	Center pivot nozzle retrofit.	Agricultural BMPs	Completed	2015	10,901	1,847	Orange Creek Basin	N/A	Not provided	N/A	SJRWMD	SJRWMD–$91,989	N/A
SJRWMD	Colvin Farms	OCB04	Colvin Farms Soil Moisture and Climate Sensor Telemetry	Soil moisture and climate sensor telemetry.	Agricultural BMPs	Completed	2015	21,688	3,675	Orange Creek Basin	N/A	Not provided	N/A	SJRWMD	SJRWMD–$75,881	N/A
SJRWMD	Colvin Farms	OCB05	Colvin Farm Soil Grid Mapping and Variable Rate Fertilizer Applicator	Soil grid mapping and variable rate fertilizer applicator.	Agricultural BMPs	Completed	2015	10,672	1,808	Orange Creek Basin	N/A	Not provided	N/A	SJRWMD	SJRWMD–$36,050	N/A
SJRWMD	North Caledonia	OCB06	North Caledonia Tailwater Storage and Recovery, Soil Moisture Sensors, and Telemetry	Tailwater storage and recovery, soil moisture sensors, and telemetry.	Agricultural BMPs	Underway	2019	233	169	Orange Creek Basin	N/A	Not provided	N/A	SJRWMD	SJRWMD–$450,035	N/A
SJRWMD	N/A	OR01	Development of PLRGs for Orange Lake	Diagnostic studies, water quality data, and hydrologic models used to estimate target nutrient concentrations to meet water quality standards and nutrient load reductions to restore water quality. Assist DEP with development of TMDL.	Study	Canceled	N/A	N/A	N/A	Orange Lake Basin	N/A	$1,000,000	N/A	SJRWMD Ad Valorem/ Water Management Lands Trust Fund/ Legislative Appropriations/ Ecosystems Management Trust Fund/ SWIM Fund	Not provided	N/A
SJRWMD	Alachua County	OR03	Lochloosa Wildlife Conservation Area	Land around Lochloosa Lake and around north side of Orange Lake. Land acquisition for Lochloosa Wildlife Conservation Area. Benefits by no increase in surface runoff of pollutants because of land use change.	Land Acquisition	Completed	2003	N/A	N/A	Orange Lake Basin	28,337	$16,058,211	N/A	SJRWMD Ad Valorem/ Preservation 2000/ Alachua County Cost Share	Not provided	N/A
SJRWMD	N/A	OR31	Prairie Creek Diversion Structure Replacement	Current water control structure at Camps Canal regulates flow from Prairie Creek to Paynes Prairie and Orange Lake. Replacement of structure will allow for open and closures as needed.	Control Structure	Planned	2019	Not provided	Not provided	Orange Lake Basin	N/A	$700,000	Not provided	SJRWMD Ad Valorem/ Amendment 1 Funding	Not provided	N/A

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SJRWMD	Mid-State Research	OR32	Mid-State Research Irrigation Conversion	Irrigation conversion.	Agricultural BMPs	Completed	2015	146	45	Orange Lake Basin	14	$48,682	N/A	SJRWMD	SJRWMD–$43,813	N/A
SJRWMD	Mid-State Research	OR33	Mid-State Research Soil Grid Mapping and Variable-Rate Fertilizer Applicator	Soil grid mapping and variable-rate fertilizer applicator.	Agricultural BMPs	Completed	2015	2,034	630	Orange Lake Basin	380	$44,864	N/A	SJRWMD	SJRWMD–$40,377	N/A
SJRWMD	Southern Grace Farm	OR34	Southern Grace Farm Irrigation Conversion	Irrigation conversion from overhead to drip.	Agricultural BMPs	Completed	2019	82	16	Orange Lake Basin	N/A	Not provided	N/A	SJRWMD	SJRWMD–$167,727	N/A
Town of McIntosh	N/A	MCINTOSH 01-ORANGE	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	N/A	1	Orange Lake Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided
Town of Micanopy	N/A	MICANOPY 01-ORANGE	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	N/A	2	Orange Lake Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided
Town of Reddick	N/A	REDDICK01-ORANGE	Education Outreach	Educational efforts that result in 0.25 % to 6 % credit, depending on extent of efforts.	Education Efforts	Completed	N/A	N/A	1	Orange Lake Basin	N/A	N/A	Not provided	Not provided	Not provided	Not provided

Appendix E. References

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