

2015 ANNUAL PROGRESS REPORT

for the Orange Creek Basin Management Action Plan

prepared by the
Division of Environmental Assessment and Restoration
Watershed Restoration Program
Florida Department of Environmental Protection
Tallahassee, Florida 32399

in cooperation with the
Orange Creek Basin Working Group

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This 2015 Orange Creek BMAP progress report was prepared as part of a statewide watershed management approach to restore and protect Florida's water quality. It was prepared by the Florida Department of Environmental Protection in cooperation with the Orange Creek Basin Working Group:



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LIST OF ACRONYMS AND ABBREVIATIONS

BMAP	Basin Management Action Plan
BMP	Best Management Practice
cfs	Cubic Feet Per Second
cfu/100mL	Colony-forming Units Per 100 milliliters
department	Florida Department of Environmental Protection
EPD	Environmental Protection Division (of Alachua County)
FDACS	Florida Department of Agriculture and Consumer Services
FDOT	Florida Department of Transportation
FFS	Florida Forest Service
FWC	Florida Fish and Wildlife Conservation Commission
GRU	Gainesville Regional Utilities
lbs/yr	Pounds Per Year
lbs-N/yr	Pounds of Nitrogen Per Year
MFL	Minimum Flows and Levels
NOI	Notice of Intent
SJRWMD	St. Johns River Water Management District
SWAP	Save Water, Add Plants
TMDL	Total Maximum Daily Load
TN	Total Nitrogen
TP	Total Phosphorus
WBID	Waterbody Identification

SUMMARY

TOTAL MAXIMUM DAILY LOADS

The TMDLs for the Orange Creek Basin were adopted by the Florida Department of Environmental Protection in September 2003 and for Alachua Sink in 2006. The TMDLs target total phosphorus (TP), total nitrogen (TN), and fecal coliforms bacteria.

The Phase I Orange Creek Basin Management Action Plan for Newnans Lake, Orange Lake, Lake Wauberg, Alachua Sink, Hogtown Creek, Sweetwater Branch, and Tumblin Creek was adopted in May 2008 to implement these TMDLs. The Phase II BMAP was adopted in July 2014. The Phase II BMAP has a priority goal of identifying management actions and projects that will result in larger reductions in nutrient loading to Newnans Lake, Orange Lake, Lake Wauberg, and Lochloosa Lake. A draft nutrient TMDL for Lochloosa Lake was presented at public meetings in early 2015, but has not been adopted.

This 2015 Progress Report is the annual assessment report for the Orange Creek BMAP, and it describes the major accomplishments and issues identified during the reporting period of January 1, 2014 through June 30, 2015.

MAJOR ACCOMPLISHMENTS

A total of 178 active, proposed, or completed projects are included in the BMAP. That total includes an additional 15 projects that were added to the BMAP during the reporting period. Major projects were completed or progress made to implement restoration activities since the adoption of the second phase BMAP in July 2014 and are described in this document.

The Paynes Prairie Sheetflow Restoration Project is operational and open for recreational use. Along with upstream urban stormwater management improvements and maintenance more than 125,000 pounds of nitrogen per year (lbs-N/yr) are prevented from entering Paynes Prairie and the Floridan aquifer. This accounts for about 60% of the TN loading reduction required in the Alachua Sink TMDL and it exceeds the 45% reduction required for the TMDL's wasteload allocation. This project was a significant undertaking for basin stakeholders including Gainesville Regional Utilities, City of Gainesville, Florida Department of Transportation, and Paynes Prairie State Preserve with funding and technical support from the department, St. Johns River Water Management District (SJRWMD), and Alachua County. The

project was awarded *Outstanding Achievement* from the Florida Stormwater Association and *Project of the Year* from the Florida Section of the American Society of Civil Engineers.

Agricultural acreage covered by a best management practice (BMP) Notice of Intent (NOI) increased by more than 2,100 acres with the result that almost 12% of the basin's non-silviculture agriculture acreage is now covered by an NOI. As of June 2015, an estimated 73,332 acres of forest in the Orange Creek Basin are covered under a silviculture BMP NOI.

The Florida Forest Service (FFS) established the Newnans Lake State Forest in January 2015. The FFS is restoring pinewood habitat with the conversion of about 100 acres of pasture and cropland to longleaf pine forest with the potential for reducing the nutrient loading from runoff. During this reporting period, the FFS conducted 40 BMP workshops across the state of which six were conducted in the basin. Locally, 182 people participated in these workshops.

The Marion County Orange Creek Basin (Orange Lake) Watershed Management Plan is on schedule with expected delivery of a capital projects report in fiscal year 2016/17. This plan will be used by the county to identify water quality issues and prioritize projects that correct those issues.

Alachua County adopted a landscape irrigation efficiency code, and staff from the county as well as partners in the Gainesville Clean Water Partnership are doing pilot tests of the Turf SWAP (Save Water, Add Plants) program. The Turf SWAP program encourages residents to replace high maintenance turf grass (irrigation, fertilizers, pesticides, etc.) with Florida Friendly Landscaping. Details are available at MyYardOurWater.org.

Alachua County Environmental Protection Division completed field surveys and sampling of Little Hatchet Creek and Gum Root Swamp sediments to better determine potential inputs of phosphorus into Newnans Lake. The county with contractual support completed an evaluation of the feasibility of muck removal from Newnans Lake and assessment of potential projects that would address external phosphorus loading from Little Hatchet Creek. They are pursuing funding for additional scoping efforts to determine feasibility of projects that would reduce nutrient loading from the Little Hatchet Creek watershed and Brittany Estates Mobile Home Park into Newnans Lake. A request for a legislative appropriation for these efforts was not funded for 2015/2016.

The Florida Fish and Wildlife Commission (FWC) started development of an Orange Lake Habitat Management Plan with a stakeholder outreach process. When complete, elements of that plan may be considered for incorporation into the BMAP. The FWC, with cooperation from the department and other member agencies of the Orange Creek Basin Interagency Working Group, sponsored a public workshop in September 2014 to gather input from local residents of their concerns for management of the lakes within the Orange Creek Basin. About 200 people attended that event. At the request of meeting attendees, the FWC held a pesticide and aquatic plant management outreach forum to explain how aquatic vegetation is controlled on basin lakes.

The SJRWMD provides a variety of public education and outreach programs to local communities that cover water regulations, water conservation, and landscaping. Online education and school programs (the Great Water Odyssey, Water Conservation, and the Springs Protection Challenge) reached 55 schools, 79 teachers, and 6,150 students.

The City of Gainesville is updating the Lake Forest, Little Hatchet, Hogtown, and Possum Creek Watershed Management Plans. Lake Forest and Little Hatchet Creeks are tributaries of Newnans Lake. Plan completion is expected during Phase II of the BMAP. When completed, these plans will identify water quality and land restoration projects for these basins that can be adopted into the BMAP.

WATER QUALITY TRENDS

The 2008-2014 annual average concentrations of TN, TP, and chlorophyll a are still higher than levels during the TMDL development period. However, with the exception of TP for Orange Lake, the average concentrations during the 2008-2014 data period for TP, TN, and chlorophyll a are similar (no increase) or lower when compared to the 2007-2013 data period. Lake stages and annual rainfall amounts increased in 2014 compared to 2013. Rates of exceedance of the daily fecal coliform standard of 800 colony-forming units per 100 milliliters (cfu/100mL) for each stream remain lower than the rates determined for the TMDL development data period for 2008-2014, but the exceedance rate for Tumblin Creek has increased compared to the 2007-2013 data period. Annual median values of fecal coliform continue to decline for Tumblin Creek and Sweetwater Branch from a peak in 2012 but are increasing in Hogtown Creek.

Section 1: INTRODUCTION

1.1 PURPOSE OF THE REPORT

This is the first annual progress report for the second phase Orange Creek Basin Management Action Plan. It provides an update of activities that are underway or planned and those that have been completed during the reporting period from January 1, 2014 through June 30, 2015. **Section 2** and **Section 3** describe the water quality monitoring in the basin and observations of changes in water quality that occurred during the reporting period. **Section 4** describes the projects and activities that occurred during the reporting period. **Section 5** outlines activities and issues that will be undertaken between July 1, 2015 and June 30, 2016.

1.2 TOTAL MAXIMUM DAILY LOADS FOR THE ORANGE CREEK BASIN

The TMDLs for these waterbodies were adopted by the Florida Department of Environmental Protection in September 2003 and 2006. The Orange Creek BMAP addresses the total nitrogen (TN), total phosphorus (TP), and fecal coliform TMDLs for the following waterbody identification (WBID) numbers: WBID 2705B, WBID 2749A, WBID 2741, WBID 2720A, WBID 2698, WBID 2718A, WBID 2711. Details for these TMDLs can be found in the Phase 2 BMAP available at [Orange Creek BMAP](#). A draft nutrient TMDL for Lochloosa Lake was presented at public meetings in early 2015, but has not been adopted. The draft Lochloosa Lake TMDL can be found at [Lochloosa Lake and Cross Creek TMDL](#).

1.3 AREA COVERED BY BMAP

The Orange Creek basin boundary and impaired waterbodies addressed by this BMAP are displayed in **Figure 1**. The impaired waterbodies are located in Marion County and Alachua County. The Orange Creek Basin does include part of Putnam County in addition to areas of Marion and Alachua counties.

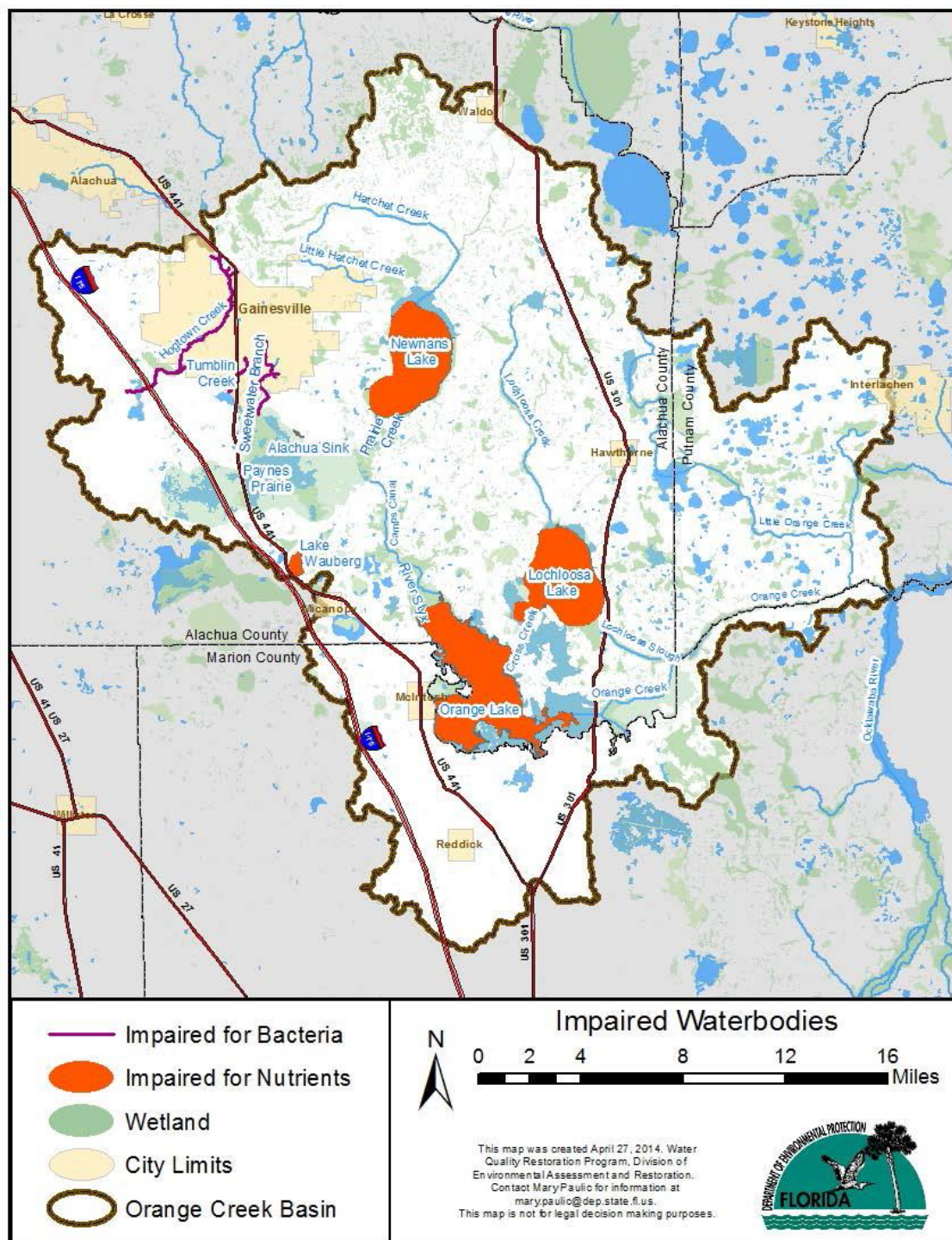


FIGURE 1: ORANGE CREEK BASIN BOUNDARY AND LOCATION OF IMPAIRED WATERBODIES

Section 2: WATER QUALITY MEASUREMENT

2.1 WATER QUALITY MONITORING

There are active sampling networks for both ambient water quality and discharge and/or water elevation. Primary monitoring agencies in this basin are Alachua County Environmental Protection Department

(EPD) and St. Johns River Water Management District (SJRWMD) with supplemental data collected by LakeWatch for Lake Wauberg, Newnans Lake, Lochloosa Lake, and Orange Lake.

Appendix B: Water Quality Monitoring contains details for all monitoring stations, status of the station, and lists the analytes monitored for at each station.

Minor adjustments were made to the monitoring plan adopted with Phase 2 of the BMAP. Alachua County EPD has ceased monitoring at a Lake Forest Creek station (LFCNE25) and added a sampling station to Sweetwater Branch (SWBNE10). Station LWAUBERGS is only sampled when the station at the center of lake cannot be accessed. SJRWMD continues to maintain all stations identified in the BMAP, but the frequency of sampling has changed from monthly to bi-monthly sampling. The SJRWMD has ceased collecting discharge data at Lochloosa Creek station 01930189.

2.2 MONITORING RECOMMENDATIONS

The SJRWMD ceased sampling for composition of phytoplankton communities in 2011 for Newnans Lake and in 2009 for Orange and Lochloosa Lakes. Phytoplankton data were not collected for Lake Wauberg. The composition of phytoplankton is useful information in addition to chlorophyll *a* for tracking changes in water quality. It is recommended that reinstatement of phytoplankton sampling for these three lakes be considered and the inclusion of Lake Wauberg in that sampling.

Currently, there is no means for measuring the water elevation in Lake Wauberg. It is recommended that installation of a staff gage be considered to measure water depth.

Section 3: WATER QUALITY OBSERVATIONS

3.1 PRECIPITATION AND HYDROLOGIC CONDITIONS

Annual rainfall calculated for the period from 1990 to 2014 is displayed in **Figure 2**. It covers the same data period over which water quality data have been measured. There have been several recent periods of low rainfall including 1998-2001 and 2006-2011 that are important for the interpretation of water quality. Annual rainfall rose in 2012 and even with a decrease in 2013, appears to be returning to a period of higher annual rainfall amounts.

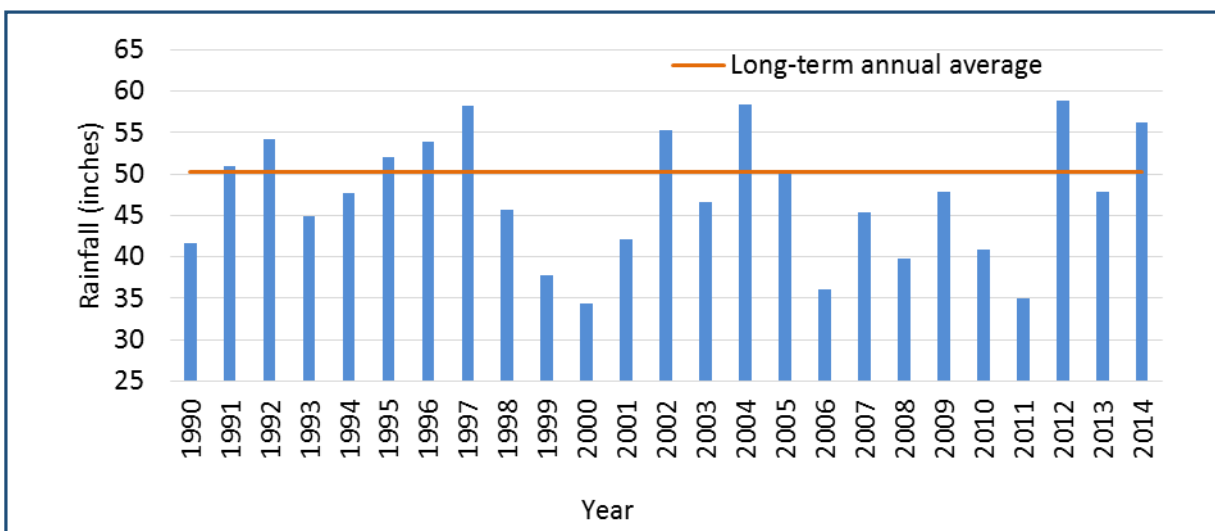


FIGURE 2: ANNUAL RAINFALL

Annual median lake stage has also been higher since 2011 (**Figure 3**). Orange Lake in particular has returned to a median stage level that last occurred in 2005. Daily mean lake stage since 2000 is displayed in **Figure 7**, **Figure 5**, and **Figure 6** for Orange Lake, Newnans Lake, and Lochloosa Lake.

Low annual rainfall amounts in addition to reducing lake elevation also may reduce or eliminate discharge of water from that lake. Measured data indicate this occurred for Newnans and Lochloosa Lake during the April/May 2011 to June 2012 period (**Figure 5** and **Figure 6**). Orange Lake experienced low lake levels with minimal (<1.0 cubic feet per second [cfs]) or no discharge (at U.S. 301) from May 2006 to February 2014 (**Figure 4**). **Figure 4** indicates the elevation at which water released from Orange Lake will top the US 301 weir. Limited lake discharge reduces flushing and increases residence time in the lake enhancing internal lake biological productivity. The reduction in volume of water has some effect on concentrating pollutants.

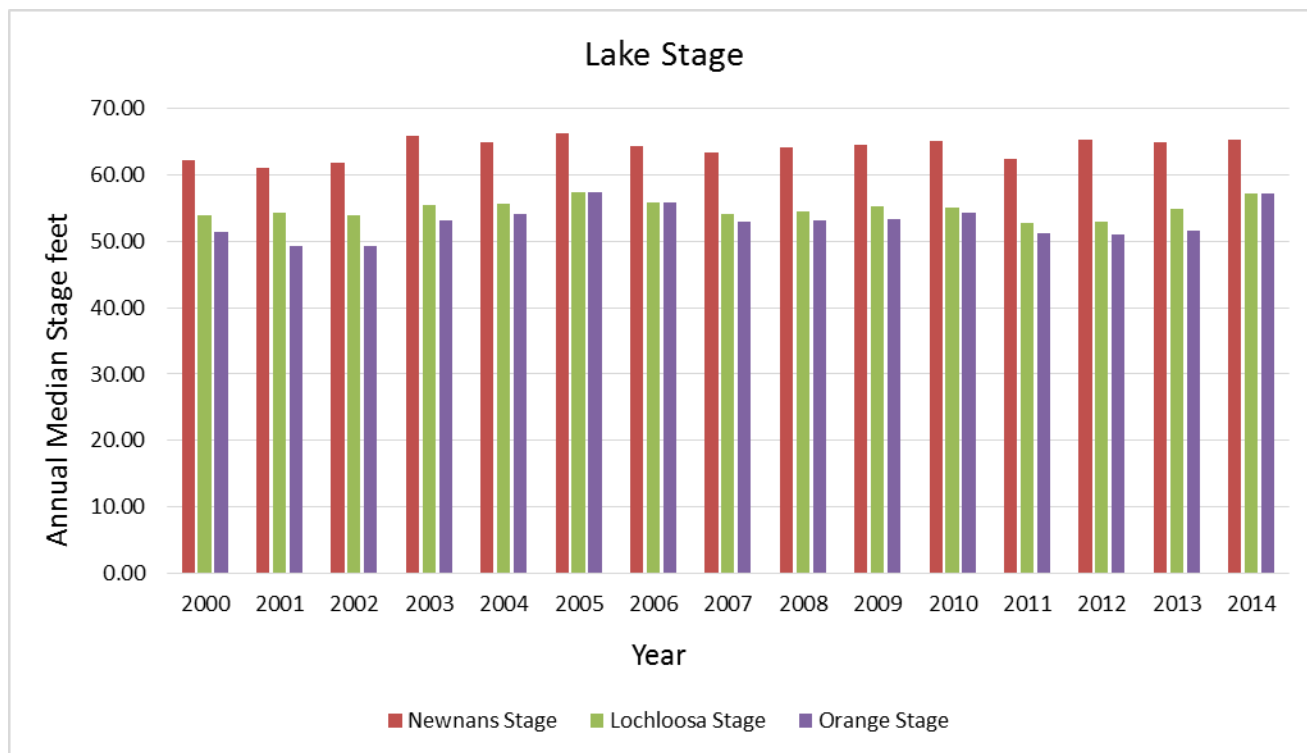


FIGURE 3: ANNUAL MEDIAN LAKE STAGE



FIGURE 4: DAILY MEAN LAKE STAGE FOR ORANGE LAKE

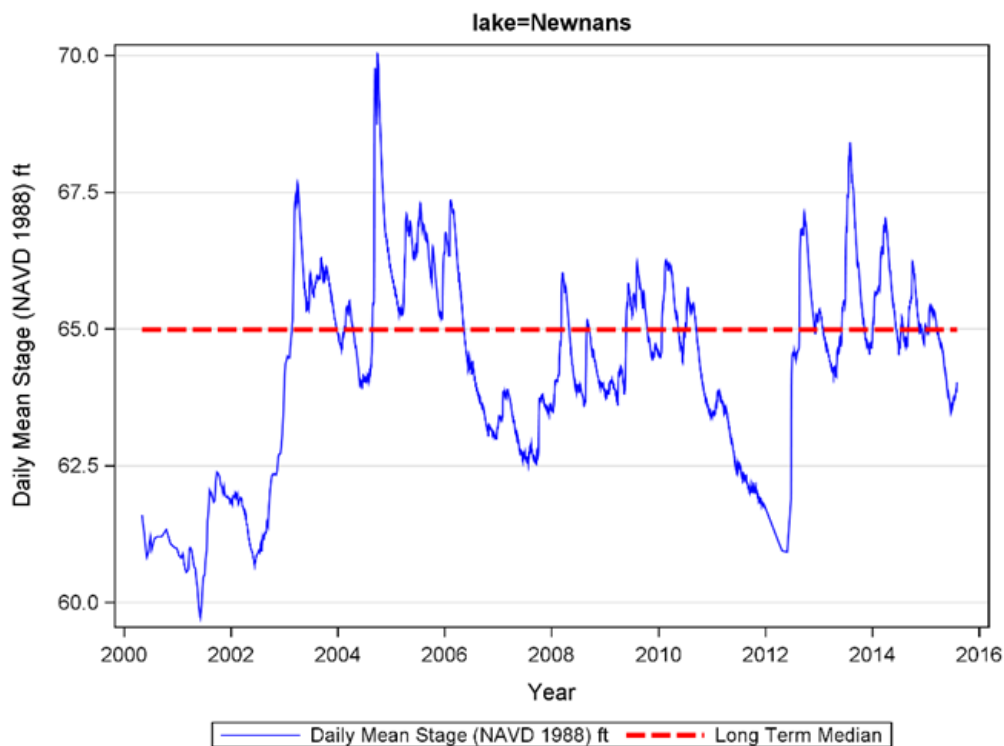


FIGURE 5: DAILY MEAN LAKE STAGE FOR NEWNANS LAKE

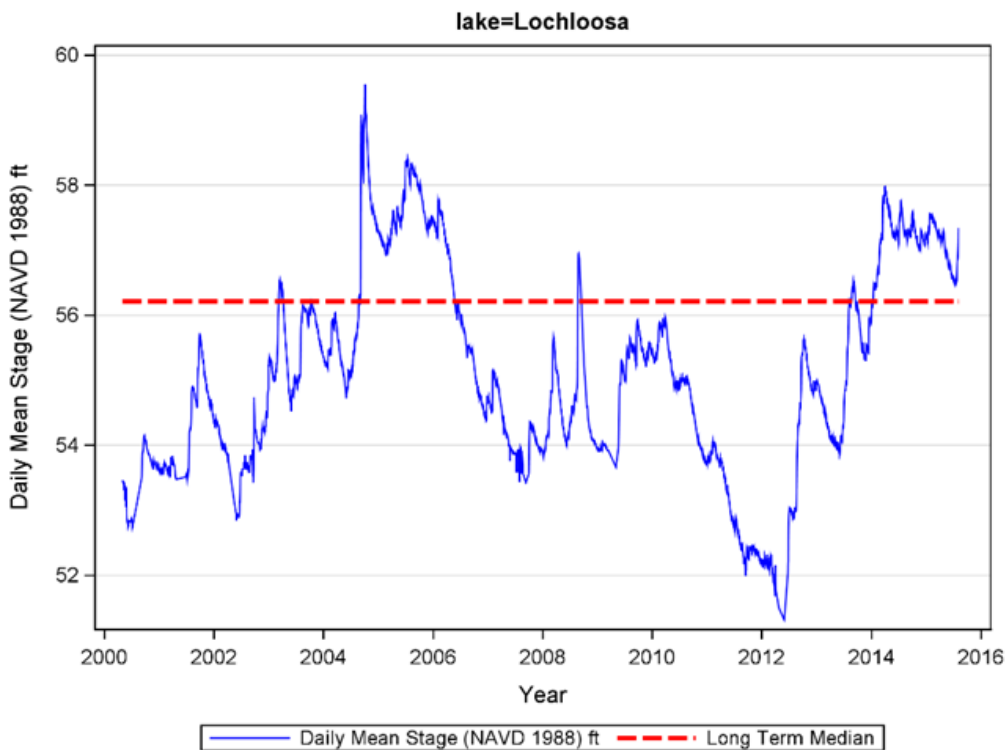


FIGURE 6: DAILY MEAN LAKE STAGE FOR LOCHLOOSA LAKE

3.2 NUTRIENT WATER QUALITY OBSERVATIONS LAKES

Periodic evaluation of concentrations of TN and TP levels is the BMAPs tool for assessing progress made in implementing TMDLs in the basin. Time series plots of TN, TP, and chlorophyll *a* confirm that concentrations have generally been increasing over the period of record of data (Magley, 2015 and Di, 2015) with some decrease in concentration evident for Newnans Lake.

The long term average TN, TP, and chlorophyll *a* concentrations were compared for Lochloosa Lake, Lake Wauberg, Orange Lake, and Newnans Lake between the TMDL development period and more recent assessment periods of 2008-2014 and 2007-2013 (**Figure 7**, **Figure 8**, and **Figure 9**). The average is calculated as seasonal average within a year, then each year is averaged together for the long term average with the exception of Lochloosa Lake. The TMDL targets and long term averages for Lochloosa Lake are geometric means, because numeric nutrient criteria being used for TMDL development require the application of geometric means. As the BMAP progresses in time, a year of data are added to the calculations and the oldest year of data are dropped off. This creates a long-term rolling annual average. This allows comparison of data between periods while allowing for water quality improvement from management actions to take effect and reducing the effect of hydrologic variations between years.

TP and TN concentrations continue to be higher in the 2008-2014 period when compared to the TMDL targets. Compared to the 2007-2013 data period, the 2008-2014 average concentrations for TP, TN, and chlorophyll *a* are similar or lower with the exception of a higher TP average for Orange Lake (**Figure 8**).

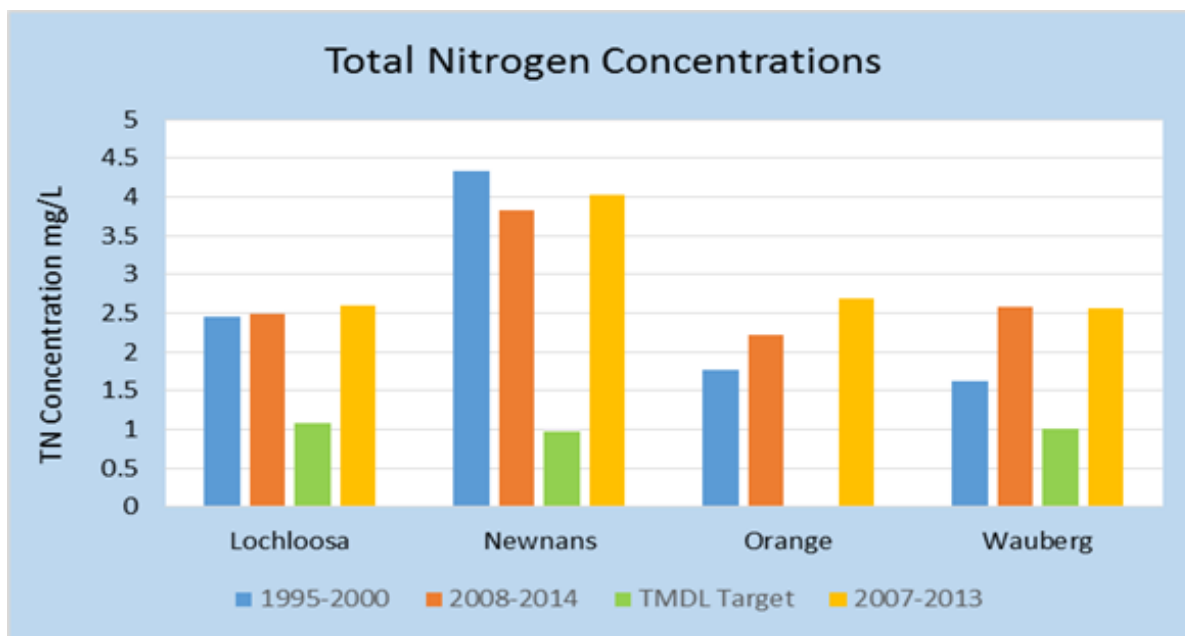


FIGURE 7: COMPARISON OF LONG TERM ANNUAL AVERAGE TN CONCENTRATIONS AMONG LAKES

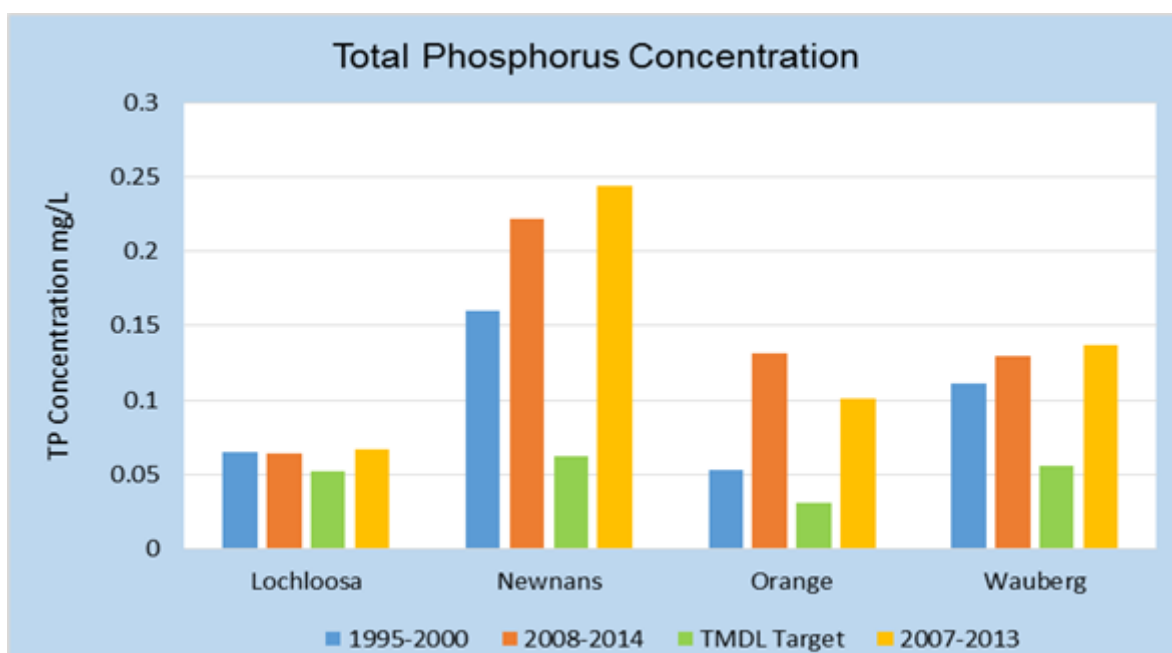


FIGURE 8: COMPARISON OF LONG TERM ANNUAL AVERAGE TP CONCENTRATIONS AMONG LAKES

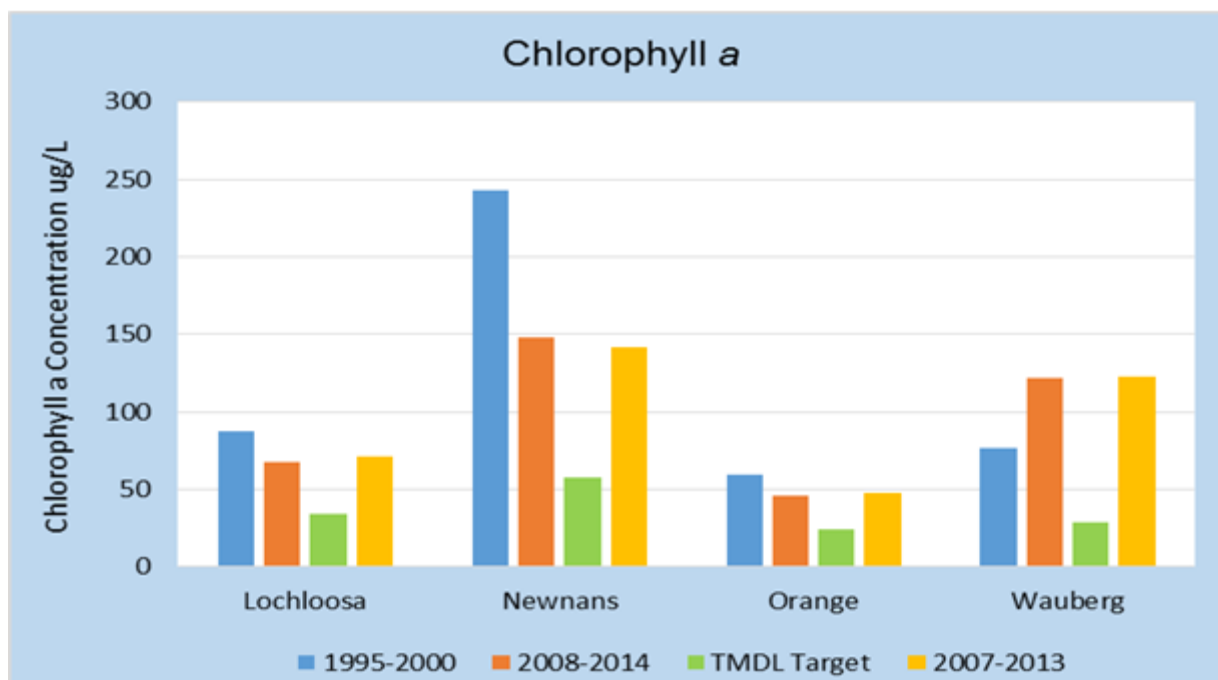


FIGURE 9: COMPARISON OF LONG TERM ANNUAL AVERAGE CHLOROPHYLL A CONCENTRATIONS AMONG LAKES

In-stream bioassessment data collection, funded by Alachua County EPD, were completed for Hogtown Creek and Tumblin Creek watersheds as well as Newnans Lake tributaries from 2012-2014 (Water and Air Research, March 2015). Additional bioassessment data were collected by the department for Sweetwater Branch and included in the evaluation. Stream Condition Index and Bioreconnaissance methods were utilized including physical/chemical characterization and habitat assessment at each station.

3.3 FECAL COLIFORM OBSERVATIONS IN URBAN STREAMS

The three urban streams, Sweetwater Branch, Tumblin Creek, and Hogtown Creek, have adopted TMDLs for fecal coliform bacteria. **Table 1** summarizes the data for the period of 2008-2014. Rates of exceedance of the daily fecal coliform standard of 800 colony-forming units per 100 milliliters (cfu/100mL) for each stream are lower than the rates determined for the TMDL development data period, but the exceedance rate for Tumblin Creek has increased compared to the 2007-2013 data period. There are still occurrences of high values greater than 2,000 cfu/100mL (range of data). **Figure 10** displays the annual medians for each stream. Annual median values continue to decline for Tumblin Creek and Sweetwater Branch from a peak in 2012, but are increasing in Hogtown Creek.

TABLE 1: COMPARISON OF FECAL COLIFORM DATA BETWEEN STREAMS FOR THE POST-BMAP ADOPTION PERIOD

STREAM NAME	DATA PERIOD	NUMBER OF SAMPLES	MEDIAN (CFU/ 100 mL)	RANGE	PERCENT EXCEEDANCE	TMDL PERCENT EXCEEDANCE
Hogtown Creek	2008-2014	185	540	32-24,000	29.7%	89%
Sweetwater Branch	2008- 2014	437	616	1-48,800	39.6%	48.4%
Tumblin Creek	2008- 2014	206	800	24-60,000	49.5%	75%

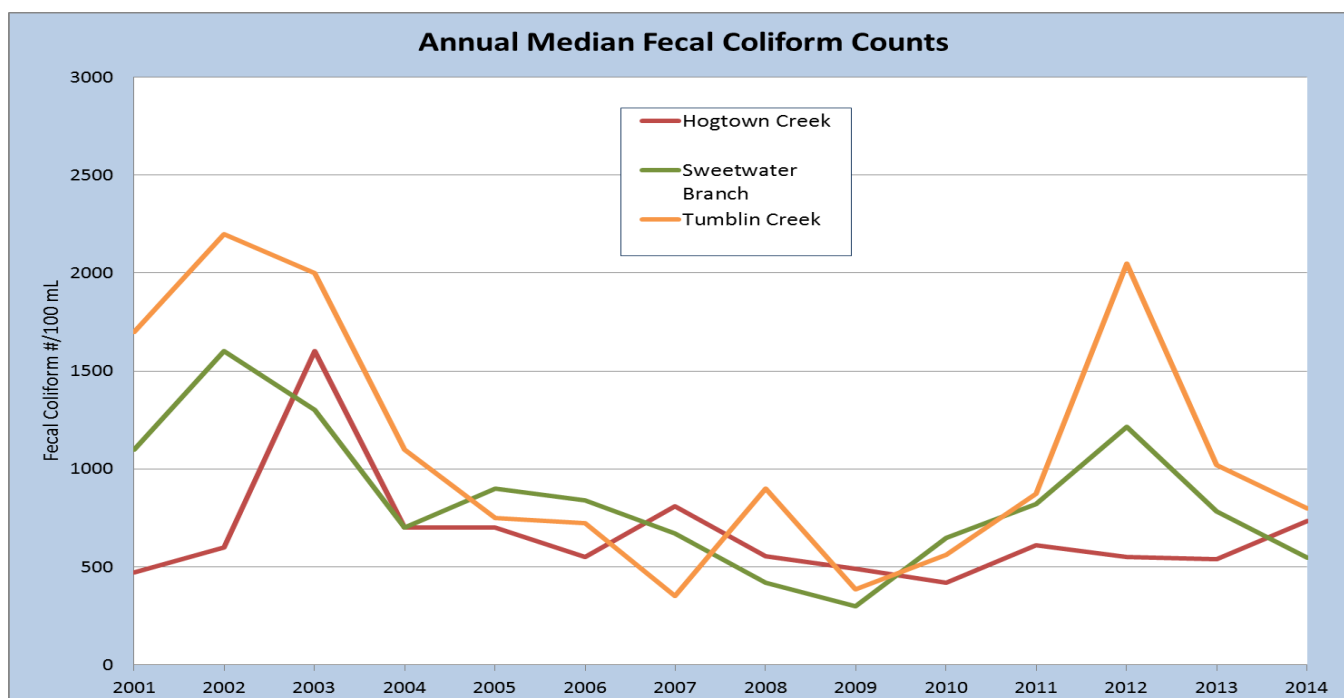


FIGURE 10: ANNUAL MEDIAN FECAL COLIFORM COUNTS FOR URBAN STREAMS

Section 4: PROJECT DESCRIPTIONS

Project status is summarized in **Table 2** for both phases of the BMAP. An additional 15 projects have been added (**Appendices**

Appendix A: Additional BMAP Projects) since January 2014. **Table 3** summarizes the type of projects adopted with each BMAP phase as well as the new projects. In total, 71 projects have been undertaken during Phase 2. Phase 1 projects included the development of seven best management practices (BMPs) by the Florida Department of Agriculture and Consumer Services (FDACS) for agriculture; for BMAP Phase 2 they will not be counted as separate projects, instead enrollment of acreage under a Notice of Intent (NOI) will be inventoried. There are nine projects listed (envisioned and pending categories) that currently do not have funding or adequate funding to complete. Projects to develop pollutant load reduction goals for Lochloosa Lake and Orange Lake are on hold. Only two projects have been cancelled or modified, because the project was not effective (see **Section 4.1**) or original project design changed substantially that it is now considered a new project (ALACHUA05). Overall for both BMAP phases, there is a total of 178 active, proposed, or completed projects. The accomplishments by individual entities in the Orange Creek basin over the past year and a half are described in **Section 4.1** through **Section 0**.

TABLE 2: SUMMARY OF PROJECT STATUS

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BMAP PHASE	NUMBER OF PROJECTS						
	COMPLETED	ON HOLD	ONGOING	ONGOING, BEHIND SCHEDULE	ENVISIONED (CONCEPTUAL)	PENDING, NOT STARTED, NOT FUNDED	REPLACED /MODIFIED
-							
Phase 1	75	2	35	-	-	-	1
Phase 2	25	-	16	4	-	6	1
New Projects	5	-	7	-	3	-	-
Totals	105	2	58	4	3	6	2

TABLE 3: SUMMARY OF PROJECT TYPES

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*Includes 9 ongoing maintenance projects in phase 2

TYPES OF PROJECTS	PHASE 1 BMAP	PHASE 2 BMAP	NEW PROJECTS
Agricultural BMPs	1	-	-
Stormwater management program implementation	7	16	4
Conservation land acquisition	13	7	2

TYPES OF PROJECTS	PHASE 1 BMAP	PHASE 2 BMAP	NEW PROJECTS
Education and outreach efforts	5	7	1
Regulations, ordinances, and guidelines	1	1	-
Restoration and water quality improvement project	15	10	2
Special studies and planning efforts	34	13	6
Structural BMPs-Load reductions not quantified	8	2	-
Structural BMPs-Quantifiable load reductions	7	-	-
Wastewater infrastructure management*	14	-	-
Other land purchases (required for structural BMP)	4	-	-

4.1 MARION COUNTY

The county continues its Clean Farms Program education outreach to local farms, a large number of which are horse farms. While the county does not have a pet waste ordinance, waste management outreach targeted at horse farms is conducted by staff from the Marion County Extension. A similar outreach position is under consideration to target cow/calf operations.

The Marion County Orange Creek Basin (Orange Lake) Watershed Management Plan is on schedule with expected delivery of a capital projects report in fiscal year 2016/17. These plans are used by the county to identify water quality issues and prioritize efforts for their correction.

The county did cancel street sweeping in the Orange Creek Basin portion of the county because it was not effective at removing debris from roads without curb and gutter.

4.2 FDACS

The Florida Forest Service (FFS) established the Newnans Lake State Forest in January 2015 (<http://www.freshfromflorida.com/Divisions-Offices/Florida-Forest-Service/Our-Forests/State-Forests/Newnans-Lake-State-Forest>). The 1,004 acre property is located on the western edge of Newnans Lake and has been owned by the state since 1921. The FFS has undertaken habitat restoration activities with the conversion of about 100 acres of pasture and cropland to longleaf pine forest with the potential for reducing the nutrient loading from runoff.

As of June 2015 an estimated 73,332 acres of the Orange Creek Basin is covered by silviculture BMP NOI. During this reporting period, the FFS conducted 40 BMP workshops across the state of which six were conducted in the basin. Locally, 182 people participated in these workshops.

There are now 6,672.3 acres of the Orange Creek Basin covered by 39 agricultural BMP NOIs issued by the Office of Agricultural Water Policy. That is an increase of 2,146.3 acres over the reporting period for a total of 11.8% of non-silviculture agricultural acreage covered by NOI. **Table 4** lists the BMPs and their acreage covered by NOI.

The Office of Agricultural Water Policy is undertaking two efforts to better inform and engage local producers in BMP requirements. The Compliance Assistance Program will track participation of producers in agriculture BMPs.

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TABLE 4: AGRICULTURAL ACREAGE, BMP ENROLLMENT, AND FUTURE ENROLLMENT GOALS FOR THE ORANGE CREEK BASIN

N/A = Not applicable

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¹ FDACS staff-adjusted acreage for purposes of enrollment is based on a review of more recent aerial imagery in the basin and local staff observations.

² See the discussion on BMP enrollment goals

2009 SJRWMD LAND USE	ACRES	FDACS ADJUSTED ACRES ¹	RELATED FDACS BMP PROGRAMS	ACREAGE ENROLLED	RELATED NOIs
Pasture and Mixed Rangeland	38,345.4	36,654.3	Cow/Calf; Future (hay)	3,484.6	18
Row/Field/Mixed Crops	10,805.2	10,402.4	Vegetable/Agronomic Crops	1,901.5	6
Horse Farm	7,496.9	7,496.9	Equine	244.5	4
Citrus	131.8	131.8	Ridge Citrus; Flatwoods Citrus	-	-
Fruit Orchards/Other Groves	1,104.5	1,507.3	Specialty Fruit and Nut	981.8	10
Abandoned Tree Crops	15.1	0.0	No enrollment needed	N/A	N/A
Nurseries and Vineyards, Ornamentals, Tree Nurseries	306.6	306.6	Nursery	60.0	1
Specialty Farms	12.7	12.7	Conservation Plan Rule	-	-
Dairies	71.2	71.2	Conservation Plan Rule/ Lake Okeechobee Protection Program ³	-	-
Cattle Feeding Operations	53.2	53.2	Conservation Plan Rule	-	-
Poultry Feeding Operations	12.0	12.0	Conservation Plan Rule	-	-
Other Open Lands – Rural	48.0	0.0	No enrollment needed	N/A	N/A
Fallow Cropland	108.4	0.0	No enrollment needed	N/A	N/A
TOTAL	58,511.0	56,648.4	N/A	6,672.3	39
5-YEAR ENROLLMENT GOAL (60%)	N/A	33,989.0	N/A	N/A	N/A
ACREAGE ENROLLED (AS OF JUNE 2015)	N/A	6,672.3	N/A	N/A	N/A
REMAINING ACRES TO ENROLL²	N/A	27,316.7	N/A	N/A	N/A

4.3 ALACHUA COUNTY

Alachua County completed small land purchases in the Alachua Sink and Newnans Lake watersheds. With these two purchases there are over 7,700 acres of conservation land purchases by the county included with this BMAP.

The county completed field surveys and sampling of Little Hatchet Creek and Gum Root Swamp sediments to better determine potential inputs of phosphorus into Newnans Lake. The county with contractual support completed an evaluation of the feasibility of muck removal from Newnans Lake and assessment of potential projects that would address external phosphorus loading from Little Hatchet Creek. Both project reports were completed in May 2015 and are available from the Alachua County EPD. Additionally, bioassessment surveys of creeks were completed. The county is pursuing funding for additional scoping efforts to determine feasibility of projects that would reduce nutrient loading from the Little Hatchet Creek watershed and Brittany Estates Mobile Home Park into Newnans Lake. Unfortunately, a request for a legislative appropriation for these efforts was not funded this year.

Alachua County adopted a landscape irrigation efficiency code, and staff from the county as well as partners in the Gainesville Clean Water Partnership are doing pilot tests of the Turf SWAP (Save Water, Add Plants) program. The Turf SWAP program encourages residents to replace high maintenance turf grass (irrigation, fertilizers, pesticides, etc.) with Florida Friendly Landscaping. Participants in the program receive a coupon for plants, free mulch, and advice from a Master Gardener. Learn more at MyYardOurWater.org.

4.4 FLORIDA FISH AND WILDLIFE CONSERVATION COMMISSION (FWC)

The FWC has started development of an Orange Lake Habitat Management Plan with a stakeholder outreach process. FWC continues aquatic plant and habitat management on Orange Lake to provide access to recreational users, nuisance plant control, and improve water quality conditions.

In cooperation with the department and other member agencies of the Orange Creek Basin Interagency Working Group, FWC sponsored a public workshop in September 2014 to gather input from local residents of their concerns for management of the lakes within the Orange Creek Basin. About 200 people attended that event. At the request of meeting attendees, the FWC held a pesticide and aquatic plant management outreach forum to explain how aquatic vegetation is controlled on basin lakes.

The department is working with FWC and other members of the Orange Creek Basin Interagency Working Group to hold a hydrogeology workshop for the public in the near future.

4.5 SJRWMD

The SJRWMD is preparing a water quality assessment of the Newnans, Lochloosa, and Orange Lake watersheds including an evaluation of tributary water quality and tributary nutrient loading into each lake.

The SJRWMD provides a variety of public education and outreach programs to local communities that cover water regulations, water conservation, and landscaping. Online education and school programs (the Great Water Odyssey, Water Conservation, and the Springs Protection Challenge) reached 55 schools, 79 teachers, and 6,150 students.

The Florida Water Star program, a water conservation certification program for new and existing homes and commercial development, began partnering with the Florida Friendly Landscaping recognition program in early 2014. The joint recognition program may add value to individual homes as well as contribute to reduced need for fertilizer and pesticides and water used for landscaping.

The SJRWMD has begun the data collection necessary to set minimum flows and levels (MFLs) for Newnans, Orange, and Lochloosa Lakes. Tentative completion date for MFLs is 2018.

4.6 CITY OF GAINESVILLE

The City of Gainesville is updating the Lake Forest, Little Hatchet, Hogtown, and Possum Creek Watershed Management Plans. These plans when complete will include active and proposed future water quality and land restoration projects for these basins.

The city has completed several small low impact development installations throughout the city with more planned. Gainesville continues to purchase lands for conservation and water quality protection. Currently, there is approximately \$1.4 million in the city's Greenspace Acquisition Fund.

4.7 FLORIDA DEPARTMENT OF TRANSPORTATION (FDOT)-DISTRICTS 2 AND 5

FDOT District 2 maintains facilities in Alachua County, and FDOT District 5 maintains facilities in Marion County. Starting in 2010, FDOT discontinued fertilizer application to medians and right-of-ways. In June 2014, it implemented statewide mandatory illicit discharge detection and elimination training for all staff and contractors working within its right-of-ways.

4.8 GAINESVILLE REGIONAL UTILITY (GRU)

The Paynes Prairie Sheetflow Restoration project is largely completed and the polishing wetland is in operation. The facility opened for limited recreational access in late spring of 2015. The project was awarded *Outstanding Achievement* from the Florida Stormwater Association and *Project of the Year* from the Florida Section of the American Society of Civil Engineers.

GRU has continued their wastewater collection system operation and maintenance activities. These activities are very important for the prevention of wastewater releases into the environment and protection of water quality. Over the reporting period, the utility performed thousands of system operation and maintenance (O&M) practices including wastewater collection system component repairs, relocations, upgrades, replacements, dye tracing, training, and emergency response. The utility also slip-lined over 20,000 feet of pipe; and closed-circuit television inspected and cleaned over a million feet of piping. GRU expenditures exceeded \$6 million on these good housekeeping and maintenance practices.

4.9 SUMMARY OF ACCOMPLISHMENTS

Progress made by stakeholders toward achieving nutrient load reductions is illustrated in **Table 5**. Both TP and TN reductions were calculated for all lakes including those with TMDLs for only TP or TN. Internal loading through nutrient recycling is a large component of the total baseline loading for Newnans Lake (72% for TN and close to 53% for TP) and Lochloosa Lake (60% for TN and 25% for TP). Current loading reductions from projects address the loading contributed by the watershed.

The greatest loading reductions have been achieved for Alachua Sink (Paynes Prairie Sheetflow Restoration Project) followed by Lochloosa Lake. Additional reductions for Alachua Sink will be partly achieved by restoring water quality in Newnans Lake. Reductions for lakes other than Alachua Sink were achieved through stormwater BMPs (structural BMPs and street sweeping) and the cessation of fertilizer use on state road right-of-ways. Loading reductions achieved with agricultural BMPs have not been considered and should add additional reductions in nutrient loading.

TABLE 5: SUMMARY OF PROGRESS TOWARD ACHIEVING TMDLS

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WATERBODY / WBID	TMDL PARAMETER	TMDL (POUNDS PER YR[LBS/YR] AS N OR P)	TMDL BASELINE TOTAL LOADING (LBS/YR)/INTERNAL LOADING	LOADING REDUCTION NEEDED (LBS/YR)	WATERSHED TOTAL LOADING REDUCTIONS ACHIEVED (LBS/YR)	REMAINING TOTAL LOADING (LBS/YR)
Newnans Lake / 2705B	TN	85,470	315,510/226,515	233,144	3,773	229,411
Newnans Lake / 2705B	TP	10,924	25,732/13,478	14,808	655.7	14,152.3
Orange Lake / 2749A	TP	15,262	27,889/-	12,623	54	12,569
Orange Lake / 2749A	TN	No TMDL	-	-	257.1	-
Lake Wauberg / 2741	TN	2,062.2	4,064/-	2001.8	163.3	1,838.5
Lake Wauberg / 2741	TP	374	748/-	374	34.4	339.6
Alachua Sink / 2720A	TN	256,322	462,557/-	206,235	125,105.8	81,129.2
Alachua Sink / 2720A	TP	No TMDL	-	-	3,359	-
Lochloosa Lake and Cross Creek / 2738A and 2754	Draft TN	168,718	443,682.4/266,655.2	274,964.4	5,824	269,140.4
Lochloosa Lake and Cross Creek / 2738A and 2754	Draft TP	12,330	21,640/5,425.5	9,310	1,032	8,278

Section 5: SUMMARY, ISSUES, AND ACTIVITIES FOR THE UPCOMING YEAR

Progress has been made toward reducing the nutrient loadings that have resulted in water quality impairments. The Paynes Prairie Sheetflow Restoration Project is operational and open for recreational use. The polishing wetland along with urban stormwater retrofits and good stormwater management practices is estimated to remove more than 125,000 lbs-TN/yr that was impacting Alachua Sink and Paynes Prairie wetlands as well as contributing TN loading to the Floridan aquifer. The project removes 60% of the TN loading from urban stormwater and wastewater exceeding the TMDL requirement of a 45% reduction.

Smaller reductions in watershed nutrient loading have been made for the other lakes. The Phase 2 BMAP has as a priority goal to identify management actions and projects that will result in larger reductions in nutrient loading to Newnans Lake, Orange Lake, and Lake Wauberg. Allocating loading reductions and finding solutions that meet that goal are the focus of the next year's activity in the basin. A large source of loading for Newnans Lake and Lochloosa Lake is internal recycling and nitrogen fixation and not from the watershed, making this a complicated issue to address. Watershed planning, evaluation, and modeling activities by local government are providing a foundation for the identification of management actions that will reduce nutrient loading. A critical issue for the next year is obtaining adequate funding for the scoping and designing of water quality improvement projects, particularly for Newnans Lake. Nutrient loading from Newnans Lake is transferred to Orange Lake impacting that lake's water quality. Close to 49% of the TP loading to Orange Lake is derived from Newnans Lake (37%) and Lochloosa Lake (12%), emphasizing the importance of restoring water quality in those lakes.

The addition of phytoplankton sampling and adding a staff gage at Lake Wauberg will be considered for implementation. The success of both those recommendation is dependent on available funding and staffing. Onsite sewage treatment and disposal systems located in Paynes Prairie Preserve State Park are under evaluation for repair.

APPENDICES

APPENDIX A: ADDITIONAL BMAP PROJECTS

The BMAP project tables below show the status of additional projects as of June 30, 2015. The schedule to implement each of the projects is included in the tables. Some projects do not have a completion date because their continued operation is necessary to maintain annual reductions in loading. Projects that are categorized as envisioned are conceptual strategies that do not have funding or full project details to predict when or how they could be implemented.

TABLE A-1: NEW PROJECTS

PROJECT NUMBER - PROJECT NAME	WATERBODY NAME / WBID	LEAD ENTITY / PROJECT PARTNERS	COST OF PROJECT (BEST ESTIMATE)	START DATE / COMPLETION OR EXPECTED COMPLETION DATE	SOURCE OF FUNDS	GENERAL LOCATION / PROJECT DESCRIPTION AND BENEFITS	TP LOADING REDUCTION (LBS PER YEAR)	TN LOADING REDUCTION (LBS PER YEAR)	AREA TREATED (ACRES)	PROJECT CATEGORY / PROJECT TYPE	PROJECT STATUS
OR20 - Orange Lake-Essen Run Deep Marsh Restoration	Orange Lake	FWC / Orange Lake Association	\$490,522.50	Feb-14 / May 16	N/A	Essen Run/South Orange Lake/ N 29.422437 - W 82.146686 / 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.	not available	not available	70	Restoration and water quality improvement project / Aquatic vegetation harvesting	On-going
OR21 - Orange Lake-Rookery Island Enhancement	Orange Lake	FWC / NA	\$205,000.00	Feb-15 / Feb-15	N/A	Bird Island, Redbird Island, North Island, Grassy Point / Mechanical shredding of dense floating vegetation and organic sediment (tussocks) from perimeter of colonial wading bird colonies to improve suitability of nesting habitat. Removal of surface matted vegetation facilitates diffusion of atmospheric oxygen into the water column and also allows sunlight to penetrate for SAV.	not available	not available	150	Restoration and water quality improvement project / Other	Complete

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PROJECT NUMBER - PROJECT NAME	WATERBODY NAME / WBID	LEAD ENTITY / PROJECT PARTNERS	COST OF PROJECT (BEST ESTIMATE)	START DATE / COMPLETION OR EXPECTED COMPLETION DATE	SOURCE OF FUNDS	GENERAL LOCATION / PROJECT DESCRIPTION AND BENEFITS	TP LOADING REDUCTION (LBS PER YEAR)	TN LOADING REDUCTION (LBS PER YEAR)	AREA TREATED (ACRES)	PROJECT CATEGORY / PROJECT TYPE	PROJECT STATUS
ALACHUA17 - Aquifer Model	Orange Creek Basin	Alachua County / Wildlife Foundation of Florida, Gainesville Clean Water Partnership	\$6,000.00	July 2014 / Ongoing	Springs Tag Grant	Alachua County and surrounding counties / Alachua County obtained a springs license plate grant to hire a contractor to create a mobile model designed to teach the public about the connection between how what we do on the land surface and how we use water affects our springs, rivers, and aquifer. Staff brings the model to events and classrooms to teach water conservation, landscaping best practices, stormdrains, pet waste, grass clippings, and more.	Unknown	Unknown	NA	Education and outreach efforts / Other	On-going
ALACHUA18 - Orange Creek Basin Project Development	Orange Creek Basin	Alachua County / NA	\$7,600.00	March 31, 2015 / May 20, 2015	Alachua County	Newnans Lake / Alachua County contracted with Florida, LLC to assess short- and long term benefits 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. The project included assessment of options to reduce nutrient loading to Newnans lake from Little Hatchett Creek. The assessments provided information on feasibility and for projects related to Little Hatchett Creek, cost information for work, in some cases additional monitoring and feasibility analyses. Implements Alachua County Comp Plan Conservation and Open Space Element - Surface Water Systems Objective 4.6 and policies.	NA	NA	NA	Special studies and planning efforts / Other	Complete

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PROJECT NUMBER - PROJECT NAME	WATERBODY NAME / WBID	LEAD ENTITY / PROJECT PARTNERS	COST OF PROJECT (BEST ESTIMATE)	START DATE / COMPLETION OR EXPECTED COMPLETION DATE	SOURCE OF FUNDS	GENERAL LOCATION / PROJECT DESCRIPTION AND BENEFITS	TP LOADING REDUCTION (LBS PER YEAR)	TN LOADING REDUCTION (LBS PER YEAR)	AREA TREATED (ACRES)	PROJECT CATEGORY / PROJECT TYPE	PROJECT STATUS
NEW32 - Little Hatchet Creek	Newnans Lake	Alachua County / City of Gainesville, FDOT, District 2, (Gainesville Clean Water Partnership) cost share	\$5,235.00	July, 14, 2015 / complete September 29, 2014	Alachua County, City of Gainesville, FDOT, District 2 (Gainesville Clean Water Partnership) cost share	Little Hatchet Creek / Field survey and sampling of stream bank soils along Little Hatchet Creek near the Gainesville Airport to evaluate soil phosphorus. Implements Alachua County Comp Plan Conservation and Open Space Element - Surface Water Systems Objective 4.6 and policies.	NA	NA	NA	Special studies and planning efforts / Other	Complete
NEW33 - Little Hatchet Creek	Newnans Lake	Alachua County / NA	\$7,387.00	June 15, 2015 / September 30, 2015	Alachua County	Little Hatchet Creek/Gum Root Swamp / Field survey and sampling of soils/sediment where Little Hatchet Creek enters and exits Gum Root Swamp to evaluate soil/sediment phosphorus. Implements Alachua County Comp Plan Conservation and Open Space Element - Surface Water Systems Objective 4.6 and policies.	NA	NA	NA	Special studies and planning efforts / Other	On-going
NEW34 - Floyd Acquisition	Newnans Lake	Alachua County / NA	\$50,501.00	Acquired May 1, 2014 / Complete May 1, 2015	Wild Spaces Public Place Surtax	Newnans Lake / Alachua County / Land acquisition- Floyd parcel 1.41 acres. To be managed as part of Newnans Lake Cypress Preserve. Benefits: No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation; implement Alachua County Comp Plan Conservation and Open Space Element - Alachua County Forever Policy 6.2.1.	Unknown	Unknown	NA	Conservation land acquisition / Other	Complete
AS20 - Teuton	Alachua Sink	Alachua County / Paynes Prairie Preserve State Park	\$11,424.00	Acquired January 9, 2014 / January 9, 2014	Wild Spaces Public Place Surtax	Paynes Prairie / Alachua County / Land acquisition - Teuton parcel 2.02 acres. To be managed as part of Paynes Prairie Preserve State Park. Benefits: No increase in surface runoff of pollutants due to land use change, continued aquifer recharge and ecosystem/habitat preservation; implement Alachua County Comp Plan Conservation and Open Space Element - Alachua County Forever Policy 6.2.1.	Unknown	Unknown	NA	Conservation land acquisition / Other	Complete

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PROJECT NUMBER - PROJECT NAME	WATERBODY NAME / WBID	LEAD ENTITY / PROJECT PARTNERS	COST OF PROJECT (BEST ESTIMATE)	START DATE / COMPLETION OR EXPECTED COMPLETION DATE	SOURCE OF FUNDS	GENERAL LOCATION / PROJECT DESCRIPTION AND BENEFITS	TP LOADING REDUCTION (LBS PER YEAR)	TN LOADING REDUCTION (LBS PER YEAR)	AREA TREATED (ACRES)	PROJECT CATEGORY / PROJECT TYPE	PROJECT STATUS
NEW35 - Eliminate nutrient load from Brittany Estates Wastewater Treatment Facility	Newnans lake	Unknown / Potential partners include: RHP Properties (owners of Brittany Estates MHP), GRU, SJRWMD, DEP	unknown	Unknown / Unknown	Unknown	Brittany Estates Mobile Home Park (5010 NE Waldo Road, Gainesville) / The goal of this project is to explore the possibility of a partnership with Gainesville Regional Utilities (GRU) and the owner of Brittany Estates to affordably transfer wastewater from the community to GRU's Main Street Water Reclamation Facility, eliminating use of the community's on-site wastewater treatment plant and its discharge to Little Hatchet Creek. Planning level costs for transfer of wastewater were estimated by GRU to be \$1,000,000. That estimate includes a new lift station, force main, and connection charges.	Unknown	Unknown	NA	Special studies and planning efforts / Other	Envisioned (conceptual), but Not Funded
NEW36 - Reduce phosphorus load to Newnans Lake from Little Hatchet Creek	Newnans Lake	Alachua County	\$130,000.00	Unknown / Unknown	Unknown	Gainesville Regional Airport / The goal of this project is to determine feasibility of reducing phosphorus load from Little Hatchett Creek to Newnans Lake by: 1. reducing volume and velocity of storm flows into Little Hatchet Creek, 2. reducing erosion P-rich Hawthorn materials into the ditch that contains the creek as it flows from Waldo Road through the Gainesville airport, and 3. chemically treating water from Little Hatchet Creek to significantly reduce phosphorus before it discharges into Newnans Lake.	Unknown	Unknown	NA	Special studies and planning efforts / Other	Envisioned (conceptual), but Not Funded
NEW37 - Reduce phosphorus load to Newnans Lake from Gum Root Swamp	Newnans Lake	Alachua County	\$116,000.00	Unknown / Unknown	Unknown	Gum Root Swamp / The goal of this project is to understand phosphorus dynamics in Gum Root Swamp sufficiently to determine if there are methods of reducing release of phosphorus from the swamp to Newnans Lake by enhancing the wetland's ability to assimilate, store, and/or transform phosphorus.	Unknown	Unknown	NA	Special studies and planning efforts / Other	Envisioned (conceptual), but Not Funded

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PROJECT NUMBER - PROJECT NAME	WATERBODY NAME / WBID	LEAD ENTITY / PROJECT PARTNERS	COST OF PROJECT (BEST ESTIMATE)	START DATE / COMPLETION OR EXPECTED COMPLETION DATE	SOURCE OF FUNDS	GENERAL LOCATION / PROJECT DESCRIPTION AND BENEFITS	TP LOADING REDUCTION (LBS PER YEAR)	TN LOADING REDUCTION (LBS PER YEAR)	AREA TREATED (ACRES)	PROJECT CATEGORY / PROJECT TYPE	PROJECT STATUS
LOCH12 - FDOT Fertilizer Cessation-Lochloosa	Lochloosa Lake	FDOT, District 2 / NA		2008 / ongoing	FDOT, District 2	State maintained roadways and right-of-ways / 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.	868.97	4163.93	189.94	Stormwater management program implementation / Other	Ongoing
NEW38 - FDOT Fertilizer Cessation-Newnans	Newnans Lake	FDOT District 2 / NA		2008 / ongoing	FDOT, District 2	State maintained roadways and right-of-ways / 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.	247.98	1285.49	59.02	Stormwater management program implementation / Other	Ongoing
OR22 - FDOT Fertilizer Cessation-Orange	Orange Lake	FDOT District 2 / NA		2008 / ongoing	FDOT, District 2	State maintained roadways and right-of-ways / 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.	54.01	257.1	11.8	Stormwater management program implementation / Other	Ongoing
WAU02 - FDOT Fertilizer Cessation-Wauberg	Lake Wauberg	FDOT District 2 / NA		2008 / ongoing	FDOT, District 2	State maintained roadways and right-of-ways / 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.	34.37	163.61	7.51	Stormwater management program implementation / Other	Ongoing

APPENDIX B: WATER QUALITY MONITORING

TABLE B-1: AMBIENT WATER QUALITY MONITORING STATIONS IN THE ORANGE CREEK BASIN

* ACEPD FIELD PARAMETERS: pH, DISSOLVED, CONDUCTIVITY, TURBIDITY, SECCHI DEPTH, DEPTH OF COLLECTION, DEPTH OF WATER COLUMN, AIR TEMPERATURE, WEATHER, CLOUD COVER (LAKES ONLY), WIND SPEED (LAKES ONLY), WIND DIRECTION (LAKES ONLY), WATER TEMPERATURE.

Alachua County EPD Surface Water Chemistry: The full suite of surface water parameters will be analyzed in the winter and summer quarters (Alkalinity, Calcium, Magnesium, Potassium, Iron, TP, field-filtered orthophosphate, Chlorine, color, sulfate, total suspended solids, total dissolved solids, ammonium, nitrogen oxides, total Kjeldahl nitrogen, TN, total organic carbon, Chlorophyll-*a* at SWB331 and ALACH sites on Paynes Prairie). Partial parameters measured in alternating quarters (TP, field-filtered orthophosphate, nitrogen oxides, total Kjeldahl nitrogen, TN, ammonia, and potassium).

Red text indicates a change in station information.

SUB-BASIN	ENTITY	STATION IDENTIFICATION	STATION DESCRIPTION	LAT.	LONG.	SAMPLING FREQUENCY	YEAR SITE EST.	SAMPLING PARAMETERS *	WBID	STATUS 2015
Newnans Lake and Hatchet Creek	SJRWMD	NEW	Newnans Lake center	29.6453	-82.22	Bi-Monthly	1994	Field parameters; Water chemistry; Chlorophyll- <i>a</i> ; Light attenuation;	2705B	Active
Newnans Lake and Hatchet Creek	SJRWMD	LFC329B	Lake Forest Creek at 329B	29.6517	-82.2511	Bi-Monthly	1998	Field parameters; Water chemistry	2709	Active
Newnans Lake and Hatchet Creek	SJRWMD	HAT26	Hatchet Creek at SR 26	29.68783	-82.2063	Bi-Monthly	1994	Field parameters; Water chemistry	2688	Active
Newnans Lake and Hatchet Creek	SJRWMD	LHT26E	Little Hatchet Creek east	29.68805	-82.22063	Bi-Monthly	1994	Field parameters; Water chemistry	2695	Active
Newnans Lake and Hatchet Creek	SJRWMD	LHAT26	Little Hatchet Creek	29.67963	-82.23443	Bi-Monthly	1994	Field parameters; Water chemistry	2695	Active
Newnans Lake and Hatchet Creek	SJRWMD	LHTNB	North branch of Little Hatchet Creek, downstream of Airport Industrial Park	29.69322	-82.26565	Bi-Monthly	1996	Field parameters; Water chemistry	2695	Active
Newnans Lake and Hatchet Creek	SJRWMD	LHATWR	Little Hatchet Creek on Waldo Road NW of Gainesville Airport	29.69868	-82.2804	Bi-Monthly	2009	Field parameters; Water chemistry	2695	Active
Newnans Lake and Hatchet Creek	SJRWMD	LRC	Lake Ridge Creek	29.66254	-85.2538	Bi-Monthly	2009	Field parameters; Water chemistry	2709	Active

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SUB-BASIN	ENTITY	STATION IDENTIFICATION	STATION DESCRIPTION	LAT.	LONG.	SAMPLING FREQUENCY	YEAR SITE EST.	SAMPLING PARAMETERS *	WBID	STATUS 2015
Newnans Lake and Hatchet Creek	SJRWMD	GRSC	Gum root Swamp Creek NE of Gainesville Airport	29.70037	-82.2547	Bi-Monthly	2009	Field parameters; Water chemistry	2695	Active
Newnans Lake and Hatchet Creek	SJRWMD	PC20	Prairie Creek at SR 20	29.61116	-82.24824	Bi-Monthly	1998	Field parameters; Water chemistry	2705A	Active
Newnans Lake and Hatchet Creek	ACEPD	LFCNE25	Upstream of University Ave on NE 25th St	29.62845	-82.30590	Quarterly	1998	Fecal coliform; Flow	2709	No longer sampled
Orange Lake	SJRWMD	OLC	Orange Lake center (between Cow Hammock & Samsons Point)	29.465	-82.1775	Bi-Monthly	1994	Field parameters; Water chemistry; Chlorophyll-a; Light attenuation;	2749A	Active
Orange Lake	SJRWMD	OC301	Orange Lake outlet west of US 301	29.4433	-82.1086	Bi-Monthly	1994	Field parameters; Water chemistry	2749A	Active
Orange Lake	SJRWMD	CCN325	Cross Creek about 50 feet north of County Road (CR) 325 bridge	29.4911	-82.1661	Bi-Monthly	1994	Field parameters; Water chemistry	2754	Active
Orange Lake	SJRWMD	STX346	River Styx at CR 346	29.5172	-82.2222	Bi-Monthly	1994	Field parameters; Water chemistry	2744	Active
Orange Lake	SJRWMD	CC234	Camps Canal at CR 234	29.57662	-82.24972	Bi-Monthly	2003	Field parameters; Water chemistry	2705	Active
Lake Lochloosa	SJRWMD	LOL	Lochloosa Lake center	29.52	-82.1247	Bi-Monthly	2003	Field parameters; Water chemistry; Chlorophyll-a; Light attenuation;	2738A	Active
Lake Lochloosa	SJRWMD	CELC	Tributary on north shore of Lochloosa Lake, east of Lochloosa Creek	29.5637	-82.1248	Bi-Monthly	2003	Field parameters; Water chemistry	2728	Active
Lake Lochloosa	SJRWMD	CELCS	Creek East of Lochloosa Creek South	29.55526	-82.1282	Bi-Monthly	2006	Field parameters; Water chemistry	2728	Active
Lake Lochloosa	SJRWMD	LC1LB	Lochloosa Creek about 2 miles north of Lochloosa Lake	29.565	-82.1406	Bi-Monthly	2003	Field parameters; Water chemistry	2693	Active
Lake Lochloosa	SJRWMD	LOCH20	Lochloosa Creek at SR 20	29.60022	-82.14468	Bi-Monthly	1994	Field parameters; Water chemistry	2693	Active

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SUB-BASIN	ENTITY	STATION IDENTIFICATION	STATION DESCRIPTION	LAT.	LONG.	SAMPLING FREQUENCY	YEAR SITE EST.	SAMPLING PARAMETERS *	WBID	STATUS 2015
Lake Wauberg	LFCACEPD	LWAUBERG	Center of Lake Wauberg east of US 441	29.55034	-82.61136	Semi-annually	2007	Field; Fecal Coliform; Surface Water; Chlorophyll	Lake Wauberg/2741	Active
Lake Wauberg	ACEPD	LWAUBERGS	Dock at UF's Lake Wauberg South	26.53442	-82.30436	Quarterly	2013	Field; Fecal Coliform; Surface Water; Chlorophyll	Lake Wauberg/2741	Back-up station, only sampled when center of lake not sampled
Hogtown Creek	ACEPD	HOGNW16	Ring Park, north of NW 16 th Avenue	29.66703	-82.34863	Quarterly	1998	Field; Fecal Coliform: Surface Water	Hogtown Creek/2698	-
Hogtown Creek	ACEPD	HOG30US	North side of CR 30 (SW 20 th Ave) upstream of bridge	29.63839	-82.39219	Quarterly	1999	Field; Fecal Coliform: Surface Water	Hogtown Creek/2698	-
Hogtown Creek	ACEPD	HOGSINK	Hogtown Creek approx. 100 meters upstream of Haile Sink	29.62973	-82.41117	Quarterly	1998	Field; Fecal Coliform: Surface Water ; Flow	Haile Sink/2717A	-
Hogtown Creek	ACEPD	POSNW16	South of NW 16 th Ave west of NW 27 th Terr.	29.66662	-82.36423	Quarterly	1996	Field; Fecal Coliform: Surface Water	Possum Creek/2696	-
Hogtown Creek	ACEPD	GLENSP	Glen Springs at spring boil in the concrete pool	29.67223	-82.34589	Quarterly	2005	Field; Flow; Micro; Surface Water	Hogtown Creek/2698	-
Sweetwater Branch	ACEPD	SWBSE4	Site is east of SE 4 th St between SE 13 th Lane and SE 11 th Place.	29.63805	-82.31809	Quarterly	2003	Field; Fecal Coliform: Surface Water ; Flow	Sweetwater Branch/2711	-
Sweetwater Branch	ACEPD	SWBNE10	East of North Main Street near NE 2 nd Street	29.63805	-82.31809	Quarterly	2015	Field; Fecal Coliform: Surface Water ; Flow	Sweetwater Branch/2711	Active
Sweetwater Branch	ACEPD	SWB331	West of SR 331 (Williston Rd) just north of SE 16 th Ave.	29.63040	-82.32242	Quarterly	1994	Field; Fecal Coliform; Surface Water; Chlorophyll (if also sampling on Paynes Prairie)	Sweetwater Branch/2711	-
Tumblin Creek	ACEPD	TUMSW5	South of SW 5 th Ave between SW 8 th St and SW 10 th St.	29.64705	-82.33366	Quarterly	2001	Field; Fecal Coliform: Surface Water ; Flow	Tumblin Creek/2718 A	-

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SUB-BASIN	ENTITY	STATION IDENTIFICATION	STATION DESCRIPTION	LAT.	LONG.	SAMPLING FREQUENCY	YEAR SITE EST.	SAMPLING PARAMETERS *	WBID	STATUS 2015
Tumblin Creek	ACEPD	TUM441	West of SW 13th Street end of concrete channel.	29.63317	-82.34058	Quarterly	1998	Field; Fecal Coliform; Surface Water ; Flow	Tumblin Creek/2718 A	-
Tumblin Creek	ACEPD	BIVARM	Bivens Arm Lake at US 441	29.62163	-82.34003	Semi-annually	1998	Field; Fecal Coliform; Surface Water; Chlorophyll	Tumblin Creek South/2718C	-
Alachua Sink	ACEPD	ALACHCHAN	Channel at Alachua Sink leading to the Primary Sink Feature, gate code #0105	29.60542	-82.30189	Quarterly	1990	Field; Flow; Micro; Surface Water	Alachua Sink 2720A	-
Alachua Sink	ACEPD	BOULSP	Boulware Spring at the spring boil near base of concrete wall	29.62097	-82.30724	Quarterly	2000	Field; Flow; Micro; Surface Water	Alachua Sink 2720A	-
Lochloosa Lake	Lake Watch	Lochloosa Lake	3 sampling locations	Unknown	Unknown	Monthly March–November; Annual Vegetation Survey	Unknown	TN, TP, Secchi depth, and chlorophyll- <i>a</i>	2738A	-
Newnans Lake	Lake Watch	Newnans Lake	3 sampling locations	Unknown	Unknown	Monthly; Annual Vegetation Survey	Unknown	TN, TP, Secchi depth, and chlorophyll- <i>a</i>	2705B	-
Orange Lake	Lake Watch	Orange Lake	3 sampling locations	Unknown	Unknown	Monthly March–November	Unknown	TN, TP, Secchi depth, and chlorophyll- <i>a</i>	2749A	-
Lake Wauberg	Lake Watch	Lake Wauberg	3 sampling locations	Unknown	Unknown	Monthly	1990	TN, TP, Secchi depth, and chlorophyll- <i>a</i>	2741	-

TABLE B-2: DISCHARGE AND WATER LEVEL MONITORING STATIONS IN THE ORANGE CREEK BASIN

*Funding provided by City of Gainesville Public Works and Alachua County Public Works Department.

- Blank cell.

Red text indicates a change at a station.

SUB-BASIN	ENTITY	STATION ID	STATION DESCRIPTION	LATITUDE	LONGITUDE	STATION TYPE	FREQUENCY	STATUS 2015
Sweetwater Branch	SJRWMD	01980199	Sweetwater Branch	29.63021	-82.32223	Discharge	Daily	Active
Paynes Prairie	SJRWMD	27274763	Paynes Prairie Channel	29.60252	-82.30295	Discharge	Daily	Active
Newnans Lake	SJRWMD	19244274	Lake Forest Creek CR329B	29.65194	-82.25139	Discharge	Daily	Active
Newnans Lake	SJRWMD	02840233	North Branch Little Hatchet Creek	29.69078	-82.25568	Discharge	Daily	Active
Newnans Lake	ACEPD	LHATWALDO	Little Hatchet Creek east of Waldo Rd.	29.69827	-82.27998	Discharge	-	-
Newnans Lake	SJRWMD	08631958	Prairie Creek	29.61094	-82.24815	Discharge	Daily	Active
Newnans Lake	SJRWMD	04831007	Newnans Lake	29.63584	-82.24365	Water Level	Daily	Active
Orange Lake	SJRWMD	08661963	Camps Canal	29.57630	-82.24944	Discharge	Daily	Active
Orange Lake	SJRWMD	02601462	Orange Lake Outlet	29.44178	-82.10851	Discharge	Daily	Active
Orange Lake	SJRWMD	19274284	Cross Creek	29.48528	-82.16528	Discharge	Daily	Active
Orange Lake	SJRWMD	19974721	River Styx	29.51711	-82.22254	Discharge	Daily	Active
Orange Lake	SJRWMD	02611465	Orange Lake Boardman	29.46198	-82.19181	Water Level	Daily	Active
Lake Lochloosa	SJRWMD	01930189	Lochloosa Creek	29.60022	-82.14468	Discharge	-	Inactive
Lake Lochloosa	SJRWMD	19234272	Lochloosa Creek South	29.56500	-82.14056	Discharge	Daily	Active
Lake Lochloosa	SJRWMD	71481615	Lochloosa Lake	29.51639	-82.10389	Water Level	Daily	Active
Hatchet Creek	SJRWMD	14342633	Hatchet Creek	29.69328	-82.20056	Discharge	Daily	Active
Hogtown Creek	ACEPD*	HOGNW16	Hogtown Creek at NW 16 th Avenue	29.66703	-82.34863	Discharge	-	Active
Hogtown Creek	SJRWMD	08641960	Hogtown Creek at Arredondo	29.63827	-82.39254	Discharge	Daily	Active
Haile Sink	ACEPD	HAILESINK	Haile Sink (terminus of Hogtown Creek)	29.62878	-82.41096	Stage	-	Active
Possum Creek	ACEPD*	POSNW16	Possum Creek at NW 16 th Avenue	26.66662	-82.36423	Discharge	-	Active
Tumblin Creek	ACEPD*	TUM441	Tumblin Creek west of US Hwy 441	29.63317	-82.34058	Discharge	-	Active

REFERENCES

Di, Jian. July 2015. *Water quality status and trend in Orange Creek Basin lakes and tributaries from 2000 Through 2014*. St. Johns River Water Management District.

Magley, W. July 2015. *Draft summary of Lake Wauberg data*. Florida Department of Environmental Protection.