

Water Quality Report for Selected Lakes and Streams

Leon County Public Works
Division of Engineering Services

Prepared Under the Direction of
Johnny Richardson
Water Resource Scientist

December 2026

(Water Quality Data collected through December of 2025)

TABLE OF CONTENTS

INTRODUCTION **3**

WATER QUALITY MONITORING PROGRAM **4**

METHODOLOGIES AND PARAMETERS **4**

HOW THE WATER QUALITY DATA IS USED **6**

BASINS

1. Bird Sink Basin **8**
Northeast Black Creek EcoSummary 9
2. Fisher Creek Basin **16**
Fisher Creek EcoSummary 17
3. Lake Iamonia Basin **21**
Lake Iamonia EcoSummary 22
Plantation Stream EcoSummary 27
Tall Timbers Creek EcoSummary 31
4. Lake Jackson Basin **35**
Jackson Heights Creek EcoSummary 36
Lake Carr EcoSummary 40
Lake Hall EcoSummary 44
Lake Jackson EcoSummary 47
Lexington Creek EcoSummary 51
Meginnis Creek EcoSummary 57
Summer Creek EcoSummary 61
5. Lake Lafayette Basin **64**
Alford Arm Creek EcoSummary 65
Apalachee Creek EcoSummary 70
Lafayette Creek EcoSummary 74
Lake Lafayette EcoSummary 79
Northeast Drainage Ditch EcoSummary 88
Unnamed Stream at Chaires Crossroad EcoSummary 93
6. Lost Creek Basin **97**
Lost Creek EcoSummary 98
7. Lake Miccosukee Basin **102**
Lake Miccosukee EcoSummary 103
Panther Creek EcoSummary 108
8. Lake Munson Basin **112**
Gum Creek EcoSummary 113
Lake Bradford EcoSummary 120
Lake Cascade EcoSummary 123
Lake Hiawatha EcoSummary 128
Lake Munson EcoSummary 131
Munson Slough EcoSummary 138

9. Ochlockonee River Basin.....147
Freeman Creek EcoSummary.....148
Harvey Creek EcoSummary.....151
Lake Talquin EcoSummary.....156
Ochlockonee River EcoSummary.....160
Polk Creek EcoSummary.....167
Soapstone Creek EcoSummary.....171
West Black Creek EcoSummary.....175
10. Patty Sink Basin.....178
Pattry Sink DrainEcoSummary.....179
11. St. Marks River Basin.....183
Chicken Branch EcoSummary.....184
Lake Weeks EcoSummary.....187
Louvinia Creek EcoSummary.....190
St. Marks River.....193

INTRODUCTION

Leon County is laced with miles of lakes, rivers, streams, and springs. These waterbodies are an integral part of the County as well as our world's ecosystem and provide various recreational and esthetic opportunities including fishing, bird watching, hunting, boating, and swimming. These waterbodies serve as stopping off points for migratory wildfowl as well as providing food and habitat for fish, amphibians, aquatic insects, mammals, and reptiles. Certain waterbodies eventually drain into sinks and enter the aquifer, which is a primary source of drinking water for much of the state. For these reasons as well as others, it is very important to protect these waterbodies for our physical, mental, and economic health, as well as the health of future generations.

Surface waters are affected by natural events as well as human activities. Natural event examples include drought, flooding, and sinkhole development. Human activities are not limited to the obvious draining of wetlands and stream channelization, but also include large-scale vegetation changes (e.g., silviculture), introduction of exotic/invasive plants or animals, pollution, illegal dumping, and site development.

The growing awareness and concern for development impacts on local lakes motivated the initial Ecology of the Lakes sampling in 1991. The initial focus on water chemistry within major lakes provided a snapshot of a lake. The monitoring program now includes biological conditions that help reflect long term influences, and stream sampling to identify stream water quality conditions as well as determine loadings to lakes and rivers.

The data collected is used to establish water quality conditions; identify lakes, rivers, and streams with potential water quality problems; and to monitor water quality trends. The data is also used by the Florida Department of Environmental Protection (FDEP) and the United States Environmental Protection Agency (EPA) to determine if a waterbody is considered impaired. As data continues to be collected, Leon County can continue to monitor the effectiveness of current stormwater and growth management practices and can help direct future efforts.

This Annual Water Quality Report provides information on the health of Leon County's lakes, streams, and rivers. The Report also presents the key issues and identifies the trends in County waterbodies which can be used in future policy and investment decisions.

The river, stream, and lake ratings that are given for each waterbody in this document are based on water quality and biological results, as well as habitat assessments, land use in the watershed/basin, impaired waterbody listings, fish consumption advisories, algal blooms, and best professional judgment from Leon County staff. Data used in this Report has been generated by Leon County or its contractors and is used as reported by contract laboratories or field personnel, with any exceptions noted in the individual waterbody reports. A digital version of this Report featuring interactive maps, as well as the data used in this Report is available at www.LeonCountyWater.org/WaterQualityReport.

WATER QUALITY MONITORING PROGRAM

The decades of water quality monitoring in Leon County provides an extensive historical data set used in the evaluation of waterbody health. The current Water Quality Monitoring Program utilizes several methods to holistically evaluate the biological, chemical, and physical condition of the waterbodies through quarterly water quality sampling and annual sediment sampling along with annual biological and habitat assessments of 12 lakes, 27 streams, and two rivers, for a total of 70 stations (Table 1 and Figure 1). For special studies, additional stations are added on a temporary basis.

METHODOLOGIES AND PARAMETERS

The current Water Quality Monitoring Program utilizes several methods to holistically evaluate the biological, chemical, and physical condition of the waterbodies. The following gives a brief overview of the different ways that we evaluate the local waterbodies.

Water Chemistry

Staff conducts quarterly sampling, testing the water for approximately 39 water quality parameters at each of the 70 sampling stations. These samples provide information on the water chemistry including nutrient concentrations, oxygen levels, dissolved and suspended solids, temperature, color, trace metals, and more. The annual lake sediment analysis tests the sediment of eight lakes for six laboratory parameters, including nutrients and particle size.

Table 1. Leon County waterbodies sampled through the Water Quality Monitoring Program.

Lakes	***Streams***	
Lake Bradford	Alford Arm Tributary	Plantation Tributary
Lake Carr	Chicken Branch	Polk Creek
Lake Cascade	Dry Creek	Soapstone Creek
Lake Hall	Fisher Creek	Summer Creek @ Bannerman Rd
Lake Hiawatha	Freeman Creek	Tall Timbers Creek 1
Lake Iamonia	Gum Creek	Unnamed Stream 3 @ Apalachee Parkway
Lake Jackson	Harvey Creek	Unnamed Stream 5 @ Apalachee Parkway
Lake Lafayette	Jackson Heights Creek	Unnamed Stream @ Chaires Road
Lake Miccosukee	Lafayette Creek	West Black Creek
Lake Munson	Lexington Tributary	
Lake Talquin	Louvinia Creek	
Lake Weeks	Meginnis Creek	
	Munson Slough	
	Northeast Black Creek	
Rivers	Northeast Drainage Ditch	
Ochlockonee River	Panther Creek	
St. Marks River	Patty Sink Drain	

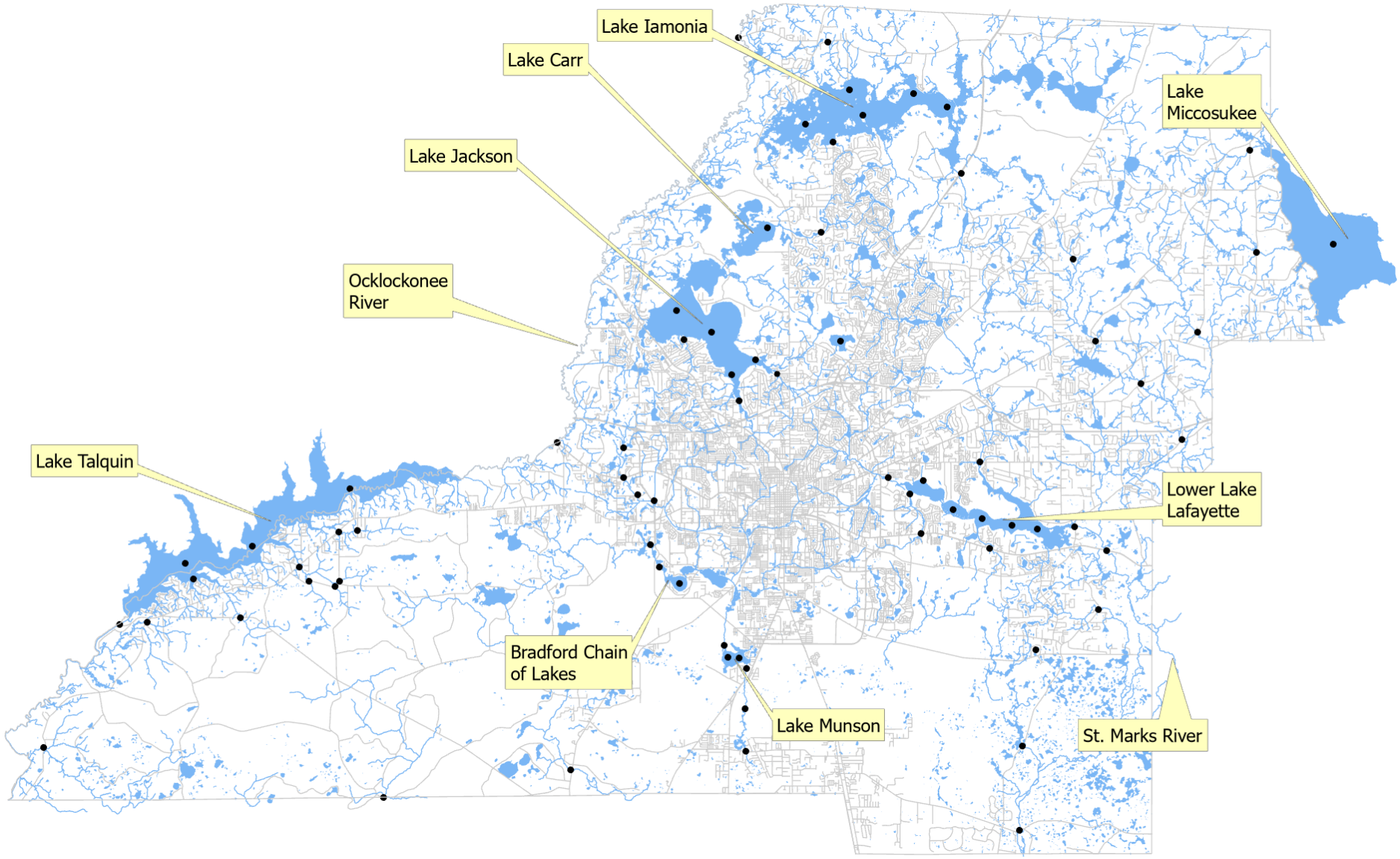


Figure 1. Locations of Leon County water quality sampling stations. Black markers represent current stations.

Biological Monitoring

In addition to assessing water chemistry, Leon County uses biological indices to evaluate the health of our streams. This allows us to study past conditions as well as current conditions and look at changes over time, rather than only relying on chemical and physical data during the time the sample was taken. Water pollution is recognized as a biological problem, which occurs when human actions adversely impact a water system. One problem of relying solely on chemical and physical measurements to evaluate water quality is that they provide data that primarily reflect conditions that exist when the sample is taken, essentially providing a "snapshot" of water quality conditions. In an adversely impacted water system, biological populations change, pollution-sensitive animals disappear, other types and numbers of animals decrease, food webs become disturbed, and undesirable nuisance species may dominate. Leon County uses the Florida Stream Condition Index (SCI) as well as the Florida Habitat Assessment to help determine the health of streams and the Lake Vegetation Index (LVI) to evaluate the plant communities on lakes.

Stream Condition Index

The SCI assesses the biological health of stream ecosystems through the evaluation of the number and diversity of macroinvertebrates (e.g., flatworms, crayfish, snails, clams, insects, etc.) living in a stream or river. Several factors including sedimentation, pollution, and habitat loss can negatively impact the health of a stream ecosystem.

Habitat Assessment

Leon County makes an assessment on the health of water bodies' habitat using established characteristics and assigns an overall habitat score that is either optimal, suboptimal, marginal, or poor. These characteristics include substrate diversity, substrate availability, water velocity, habitat smothering, artificial channelization, bank stability, riparian buffer zone width, and riparian zone vegetation quality.

Lake Vegetation Index

The LVI is a multi-metric index that evaluates how closely a lake's plant community resembles one which would be expected in a condition of minimal human disturbance. It is based on a rapid field assessment of how aquatic and wetland plants are impacted by human disturbance over time. Plants respond to physical disturbances such as introduction of exotic species or lakeshore alterations, and chemical disturbances such as introduction of excess nutrients, particulates, or herbicides from surrounding areas.

HOW THE WATER QUALITY DATA IS USED

The data obtained through the Water Quality Monitoring Program guides the Board's policy decisions, strategic planning, and investment priorities. The Program aids in identifying maintenance-type projects, as well as large-scale capital improvement projects.

The data collected through the Program provides information on the entire ecosystem health including the plants, animals, and organisms living in the system. This information is necessary to document waterbody conditions through time, identify the most effective means of stormwater management, and guide appropriate land use decisions.

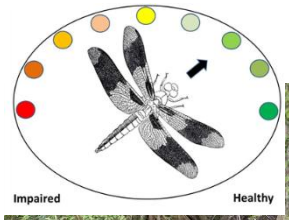
The data is also entered into the Florida Watershed Information Network (WIN) database for use by local, State, and Federal agencies. The Florida Department of Environmental Protection (FDEP) and the U.S. Environmental Protection Agency (USEPA) rely on Leon County's Water Quality Monitoring Program as the primary source of data for evaluating waterbodies in the unincorporated

areas of the County. The data is used to identify waterbodies that no longer meet State and Federal water quality standards and waterbodies for potential State- or Federal-led restoration plan consideration.

The County's extensive Monitoring Program can also be used to measure the impact of development in the unincorporated area. This provides a proactive approach and allows the County to implement local corrective measures, if needed, to address water quality or habitat impacts before a waterbody is identified for State or Federal action. Corrective measures could range from modifying future land use designations to developing a capital project to reduce pollutant loads in sensitive areas. A comprehensive land use analysis can be used to plan corrective measures. Utilizing geographic information system (GIS) to analyze the land use of contributing areas in Leon County, as well as adjacent counties and Georgia, provides information on the extent and location of development affecting our surface waters. This information is used to select either retrofit activities to address historic development or development restrictions to address water quality concerns.

1. Bird Sink Basin

Northeast Black Creek EcoSummary



Northeast Black Creek is a tannic, acidic, predominantly nitrogen-limited stream located in northeastern Leon County. The stream forms near Centerville Road and the Chemonie Plantation subdivision and flows southeast through the Miccosukee Land Cooperative before crossing under Capitola Road. The creek then turns northeast to join Still Creek and then flows into Bird Sink.

Approximately 31% of the 15,783-acre watershed is comprised of urban, agriculture, rangeland, transportation, and utilities land uses (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

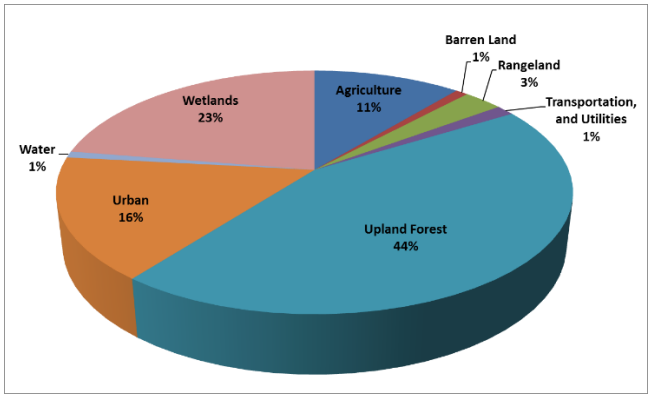


Figure 1. Bird Sink/Northeast Black Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). The latest Stream Condition Index (SCI) bioassessment was conducted in 2025 on station BC3. This information is used to determine the health of Black Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year could not always be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

Due to ongoing beaver activity, station BC1 is no longer sampled. Leon County staff continue to evaluate the hydrological and plant community changes that are occurring in this section. Station BC2 was relocated and is now called BC2M.

Nutrients

The nutrient thresholds and results are found in **Tables 1 and 2**. The NNC has never been exceeded during the period of record.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for total phosphorus or total nitrogen. Elevated nutrient values during the 2nd quarter of 2020 and the 3rd quarters of 2021, 2022, and 2023 were the result of localized rainfall events that occurred before the sampling events. The associated runoff pushed nutrient laden material into the stream, causing a temporary increase in nutrients.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a thirty-day period was exceeded several times at stations BC2M, BC3 and BC4 (**Figure 4**). Based on anthropogenic land use, FDEP considers the exceedances possibly the result of residential development in the watershed (e.g., improperly functioning septic tanks). Other causes could be wild animals and/or agriculture.

Table 1. Total phosphorus criteria and results for Northeast Black Creek.

Northeast Black Creek	Instream Protection Criteria TP (0.18 mg/L)			
Year	**BC1**	**BC2M**	**BC3**	**BC4**
2006	-	-	-	-
2007	0.18	-	-	-
2008		-	-	-
2009	0.08	-	0.07	0.06
2010	0.08	-	-	-
2011-2012	-	-	-	-
2013	0.08	0.09	0.07	0.07
2014	-	-	-	-
2015	-	-	0.06	-
2016-2017	-	-	-	-
2018	-	-	0.07	0.03
2019	-	-	-	-
2020	-	0.08	-	-
2021-2025	-	-	-	-

Table 2. Total nitrogen criteria and results for Northeast Black Creek.

Northeast Black Creek	Instream Protection Criteria TN (1.03 mg/L)			
Year	**BC1**	**BC2M**	**BC3**	**BC4**
2006	0.36	-	-	-
2007	-	-	-	-
2008	-	-	-	-
2009	0.27	-	0.69	0.72
2010	0.41	-	-	-
2011-2012	-	-	-	-
2013	0.40	0.71	0.61	0.47
2014	-	-	-	-
2015	-	-	0.66	-
2016-2017	-	-	-	-
2018	-	-	0.64	0.68
2019	-	-	-	-
2020	-	0.78	-	-
2021-2025	-	-	-	-

Dissolved Oxygen

As **Figure 5** shows, Northeast Black Creek stations occasionally did not meet the Class III criteria for dissolved oxygen (DO). Staff believe that this is a natural condition for this location, since the creek is a low gradient blackwater stream that drains wetlands.

Biochemical Oxygen Demand (BOD)

BOD levels were elevated at stations BC2M (5.5 mg/L) and BC3 (3.0 mg/L) during the 2nd quarter sampling event in 2021. Other water quality parameters taken at station BC3 were typical of the stream, so it is unknown why the BOD level was elevated. However, along with an elevated BOD level at station BC2M, the pheophytin result (31.1 µg/L) was elevated at the station as well. Pheophytin (a degradation product of chlorophyll) can contribute to higher levels of BOD.

Metals

Stations BC2M, BC3, and BC4 exceeded water quality criteria for iron during the 2nd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Stream Condition Index (SCI) and Habitat Assessment (2025)

The results of the Habitat Assessment score for Station BC3 characterize the stream habitat in the high suboptimal to low optimal range (**Table 3**). Water levels, the winter sample season, and potential habitat smothering were the primary influences on the scoring. The SCI score was 41 placing it in the healthy category (**Table 4**). Compared to the 2018 (56) and 2021 (51) scores, this SCI score is lower but remains within the same healthy categorical rating.

A total of 27 taxa were collected during the SCI sampling. The most numerous invertebrates sorted in both vials was the dipteran blackfly *Simulium* spp. Overall, this taxon expressed a moderate to strong dominance (68.3%) of total individuals sorted (213 of 312).

From the total taxa collected, five are listed as sensitive taxa by the FDEP while two are listed as very tolerant. The Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) taxa (EPT) are widely regarded as the groups of aquatic insects that contain a large number of pollution sensitive taxa. The EPT score for the station is four with one Ephemeropteran and three trichopteran taxa present.

Click here for more information about the Stream Condition Index and Habitat Assessments.

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, Northeast Black Creek met, with few exceptions, the NNC thresholds for the East Panhandle Region. Occasionally the stations did not meet the Class III criteria for DO. This is the result of normally low DO in low gradient, wetland fed systems like this stream. The *E. coli* water quality limit was exceeded several times during the period of record. All stations exceeded water quality criteria for iron during the 2nd quarter of 2025. It appears that iron levels, at least in part, appear to

be naturally occurring. Staff will continue to evaluate iron levels as additional data becomes available.

The Habitat Assessment Scores for station BC3 was in the Suboptimal/Optimal category. The SCI score indicated the presence of a stream biological community that is healthy.

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Table 3. Habitat Assessment results for Black Creek (Station BC3).

Black Creek (BC3)	**Score**	**Category**
Substrate Diversity	17	Suboptimal
Substrate Availability	8	Marginal
Water Velocity	13	Optimal
Habitat Smothering	12	Optimal
Artificial Channelization	20	Optimal
Bank Stability	10, 10	Suboptimal, Suboptimal
Riparian Zone Width	10, 10	Optimal, Optimal
Riparian Vegetation Quality	10, 10	Optimal, Optimal
Final Habitat Assessment Score	**130**	
Interpretation	**Optimal**	

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Table 4. Stream Condition Index (SCI) results for Black Creek (BC3).

Black Creek (BC3)	**Vial 1**	**Vial 2**
Stream Condition Index Metrics Scores		
Total Taxa	2.17	0.00
Ephemeroptera Taxa	2.00	2.00
Trichoptera Taxa	4.29	1.43
% Filter Feeder	10.0	10.0
Long-lived Taxa	3.33	0.00
Clinger Taxa	6.25	6.25
% Dominance	0.00	0.00
% Tanytarsini Taxa	2.67	3.45
Sensitive Taxa	4.00	5.00
% Tolerant Taxa	6.09	5.68
SCI Vial Score	45.33	37.56
Stream Condition Index Score	**41**	
Score Interpretation	**Healthy**	

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Stations BC2M, BC3 and BC4.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

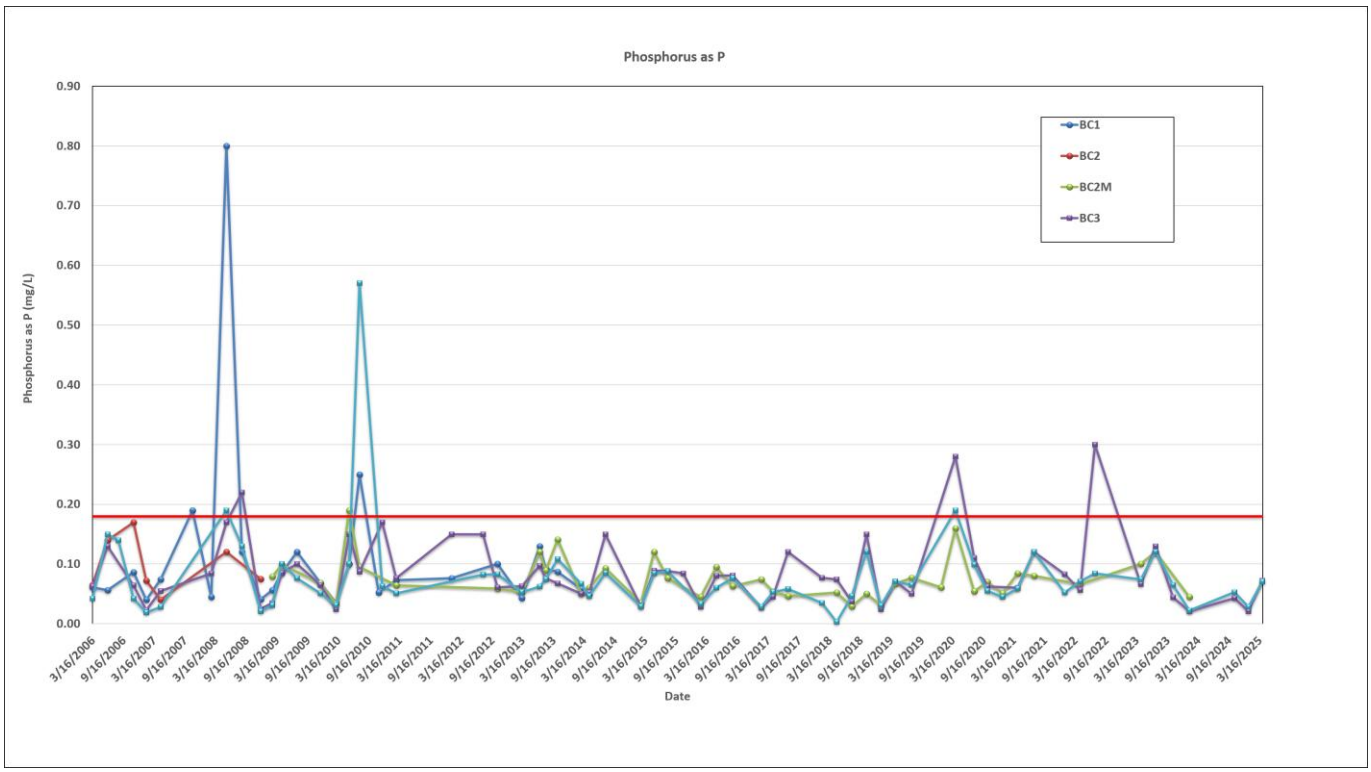


Figure 2. Total phosphorus results for Northeast Black Creek.

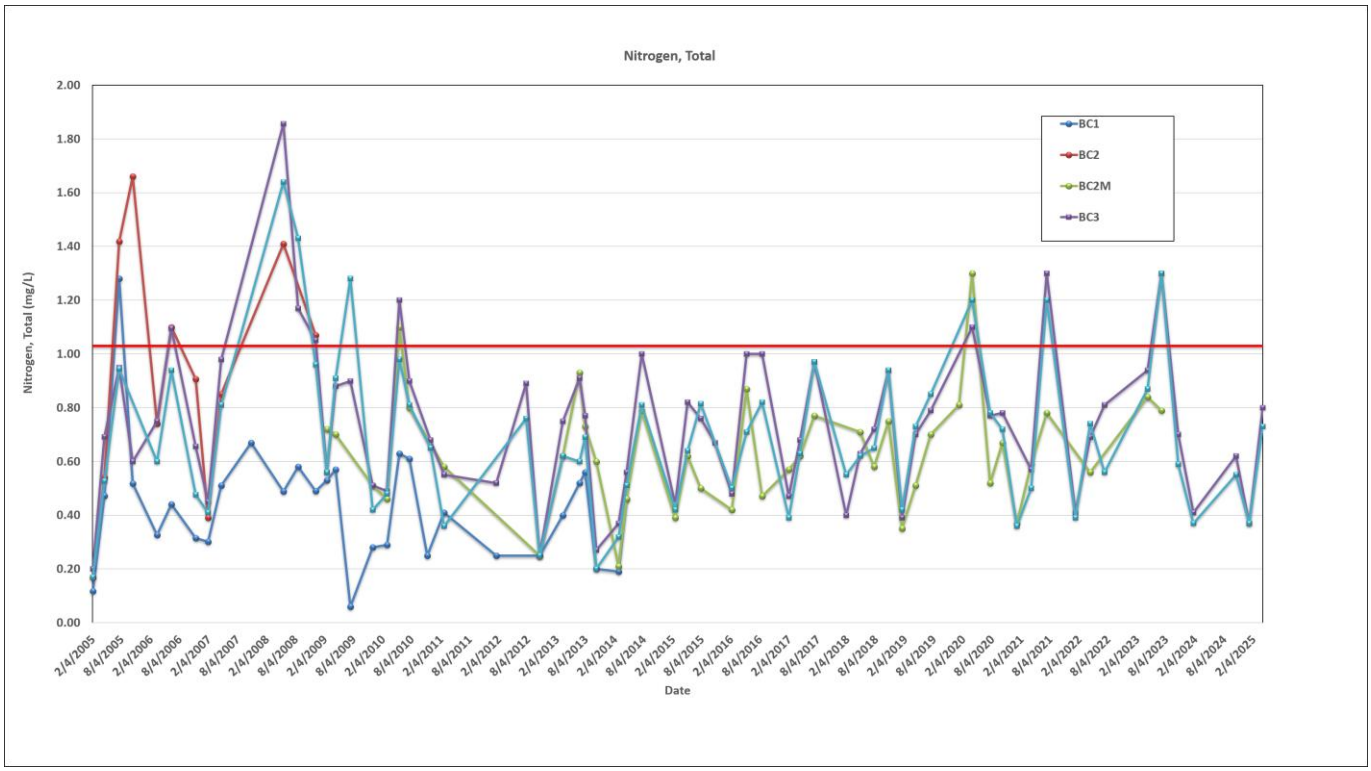


Figure 3. Total nitrogen results for Northeast Black Creek.

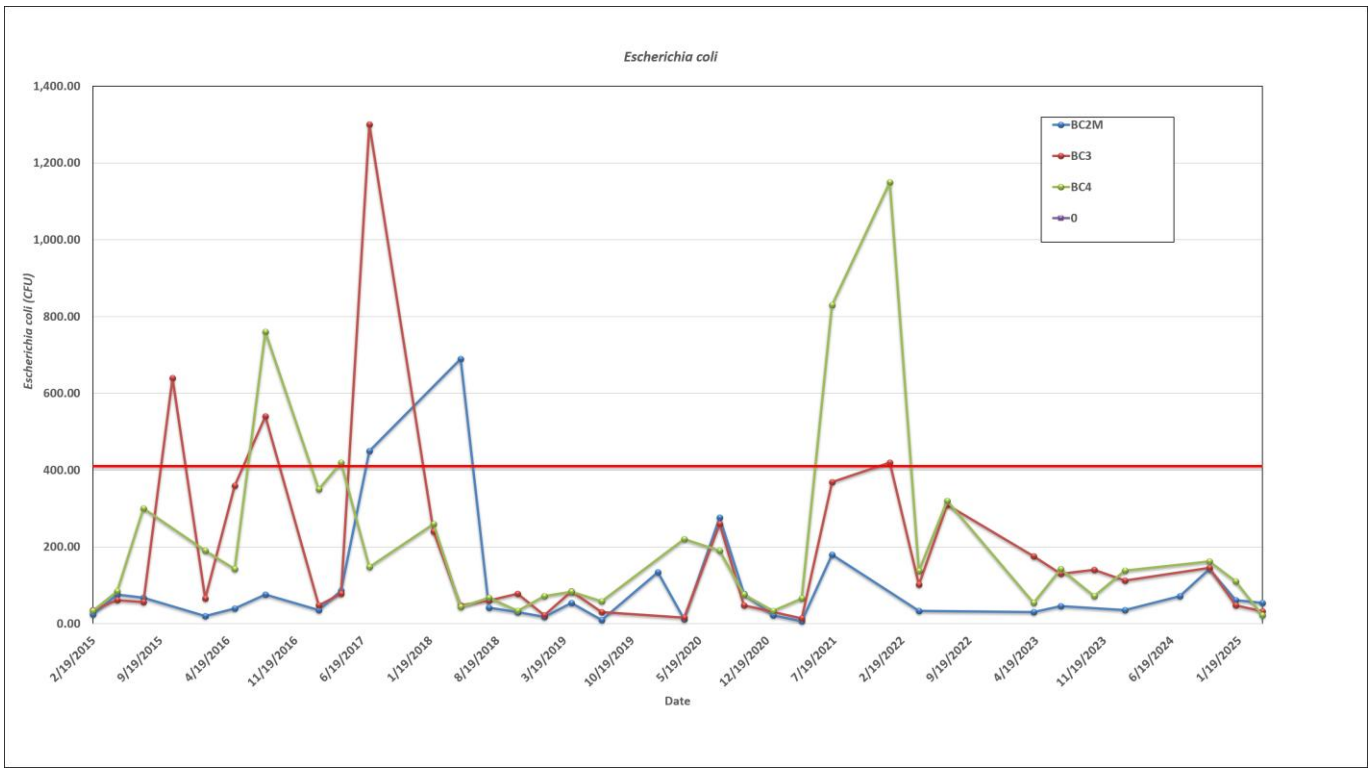


Figure 4. *E. coli* results for Northeast Black Creek.

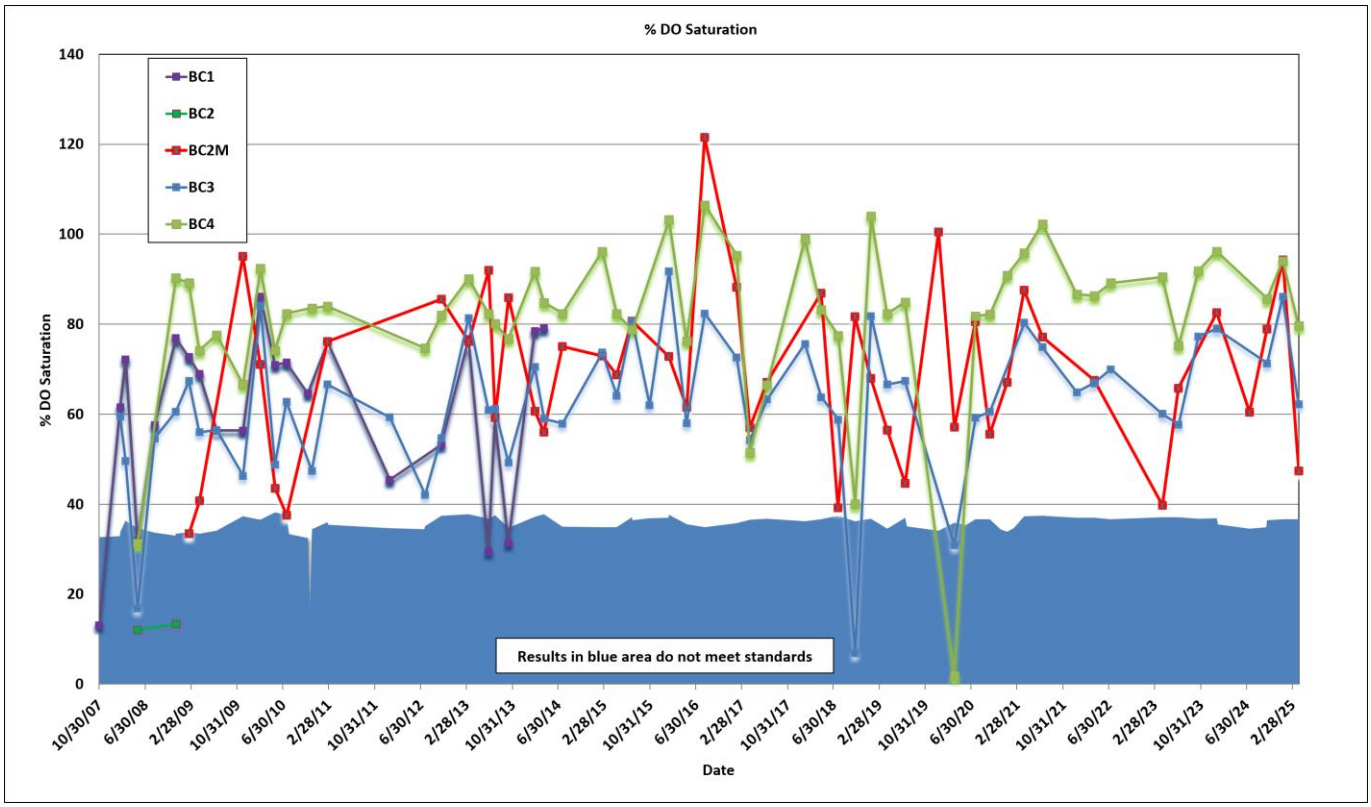


Figure 5. Dissolved Oxygen Percent Saturation results for Northeast Black Creek.

Table 3. Habitat Assessment results for Northeast Black Creek.

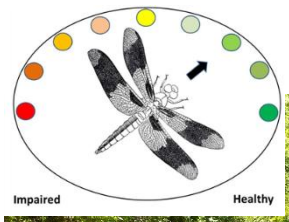
Northeast Black Creek Stations	BC2M Score	Category	BC4 Score	Category
Substrate Diversity	15	Suboptimal	10	Marginal
Substrate Availability	8	Marginal	6	Marginal
Water Velocity	12	Suboptimal	10	Marginal
Habitat Smothering	11	Suboptimal	14	Suboptimal
Artificial Channelization	19	Optimal	14	Suboptimal
Bank Stability	7, 7	Suboptimal, Suboptimal	8, 8	Suboptimal, Suboptimal
Riparian Zone Width	9, 10	Optimal, Optimal	10, 10	Optimal, Optimal
Riparian Vegetation Quality	10, 10	Optimal, Optimal	9, 9	Optimal, Optimal
Final Habitat Assessment Score	**118**		**108**	
Interpretation	**Suboptimal/Optimal**		**Suboptimal**	

Table 4. Stream Condition Index results for Northeast Black Creek.

Northeast Black Creek Stations	BC2M Vial 1	BC2M Vial 2	BC4 Vial 1	BC4 Vial 2
Stream Condition Index Metrics				
Total Taxa Score	4.35	5.35	7.83	5.65
Ephemeroptera Taxa Score	2	0	2	4
Trichoptera Taxa Score	1.43	2.86	5.71	2.86
% Filter Feeder Score	10.00	10.00	2.91	2.00
Long-lived Taxa Score	0.00	0.00	6.67	0.00
Clinger Taxa Score	6.25	5.00	7.50	6.25
% Dominance Score	6.72	6.10	9.03	9.49
% Tanytarsini Taxa Score	10.00	10.00	5.92	6.55
Sensitive Taxa Score	5	3	9	7
% Tolerant Taxa Score	7.12	6.97	8.08	7.21
SCI Vial Score	59.41	53.64	71.83	56.68
Stream Condition Index Score	**56.52**		**64.26**	
Score Interpretation	**Healthy**		**Healthy**	

2. Fisher Creek Basin

Fisher Creek EcoSummary



Located in the Apalachicola National Forest, Fisher Creek is a phosphorus-limited, naturally dark, tannic stream in southwestern Leon County. The stream eventually enters the Floridan aquifer via a sink located in the Leon Sinks Recreation Area. Dye trace studies have linked this sink to Wakulla Springs.

While the following pie chart shows the majority of the 17,984-acre watershed is relatively undeveloped, urban, residential, and rangeland land uses make up approximately 2% of the watershed (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

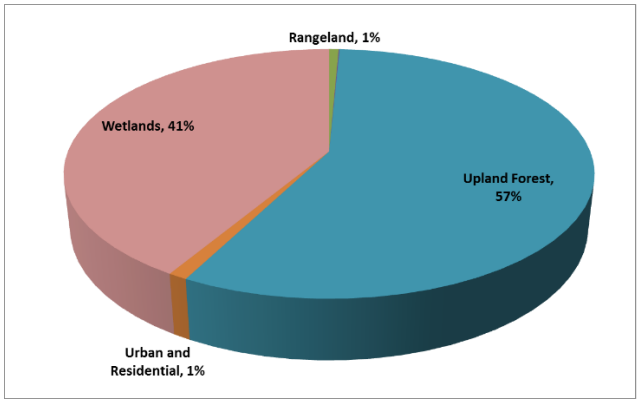


Figure 1. Fisher Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Fisher Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year could not always

be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

Nutrients

The nutrient thresholds and results are found in **Table 1**.

When data requirements were met (e.g., four samples collected in a calendar year), nutrient values were shown to not exceed the state criteria. For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). Individual values did not exceed the instream criteria for total phosphorus and rarely exceeded total nitrogen criteria.

Table 1. Total nitrogen and phosphorus criteria and results for Fisher Creek.

Fisher Creek	Total Nitrogen Threshold 1.03 mg/L	Total Phosphorus Threshold 0.18 mg/L
2007	-	-
2008	0.48	0.01
2009	0.44	0.01
2010	0.61	0.01
2011- 2012	-	-
2013	0.65	0.01
2014	0.75	0.01
2015	0.68	0.01
2016	-	-
2017	0.68	0.01
2018	0.79	0.01
2019	-	-
2020	0.67	0.01
2021	-	-
2022	0.49	0.01
2023	0.60	0.01
2024	0.41	0.01
2025	-	-

Other Parameters

Metals

Iron exceeded water quality criteria during the 3rd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. As iron is a parameter recently added to the sampling program, few samples have been collected and conclusions on the information collected are tentative. It appears that iron levels, at least in part, appear to be naturally occurring. Staff will continue to evaluate iron levels as additional data becomes available.

Click here for more information on metal levels in Leon County waterbodies.

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, Fisher Creek met the nutrient thresholds for the Big Bend Bioregion. Iron exceeded water quality criteria during the 3rd quarter of 2025. It appears that iron levels, at least in part, appear to be naturally occurring. All other water quality parameters appear to be normal.

Thank you for your interest in maintaining the water quality of Leon County's aquatic resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 50.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

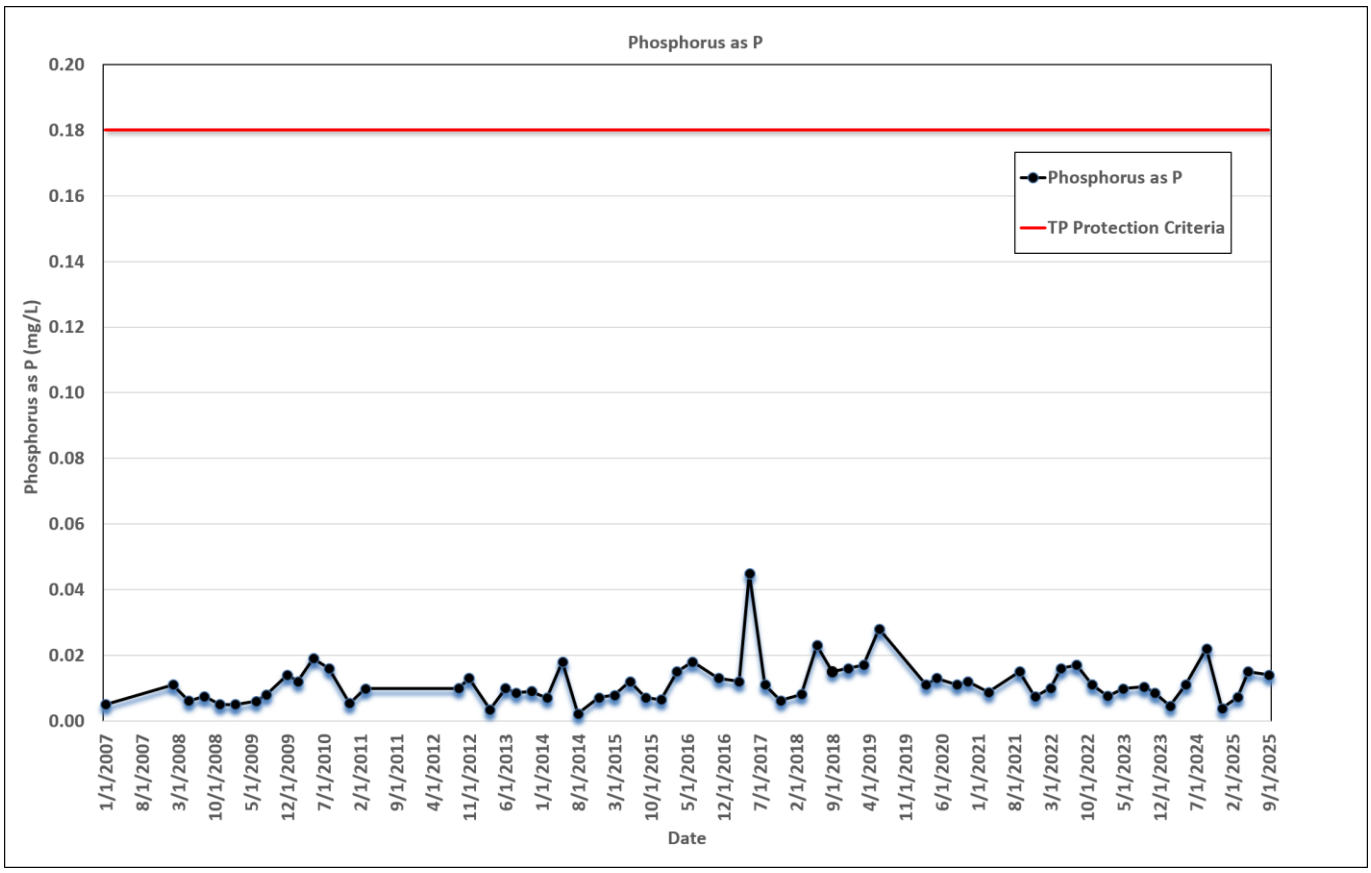


Figure 2. Total phosphorus results for Fisher Creek.

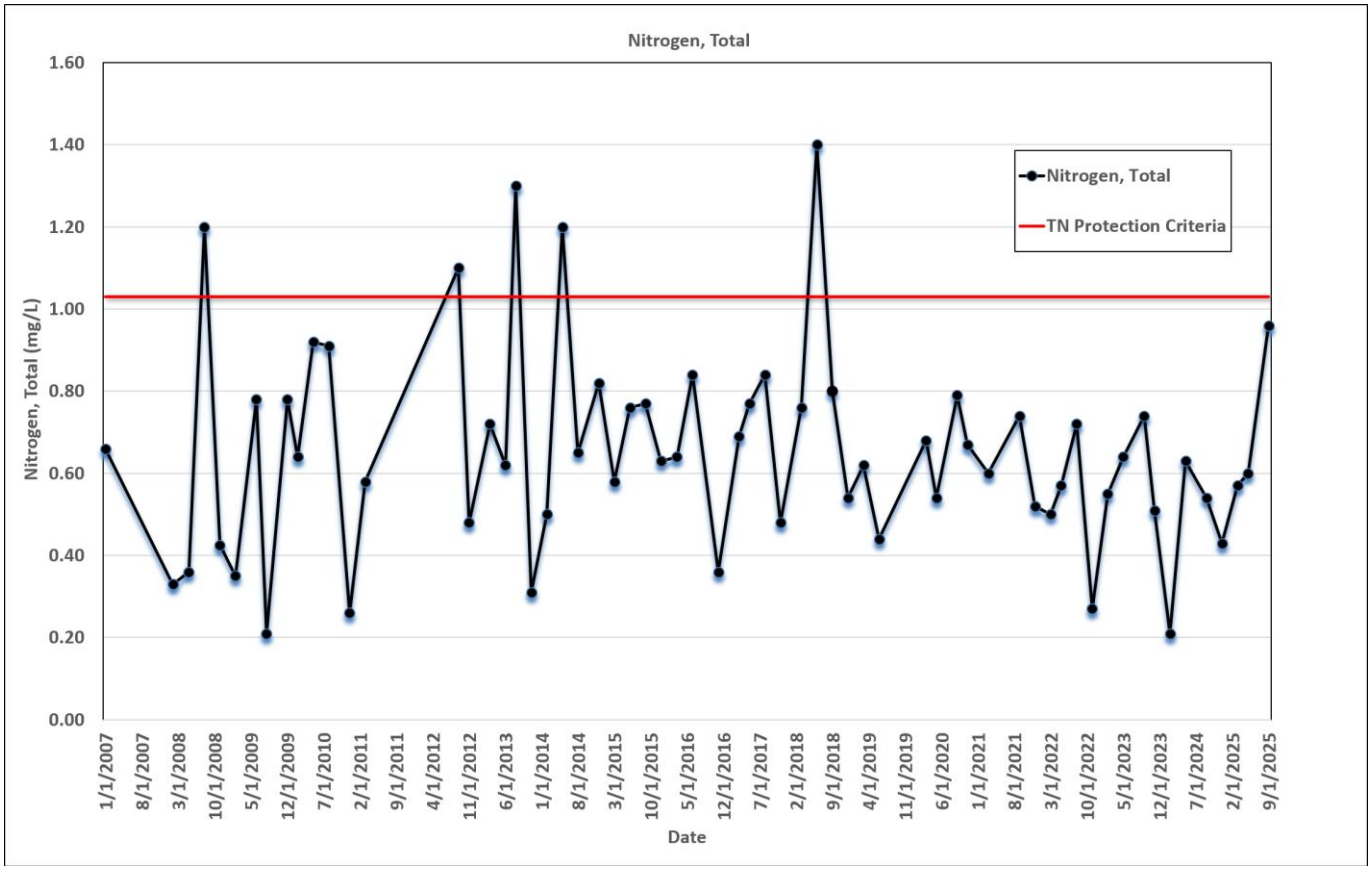
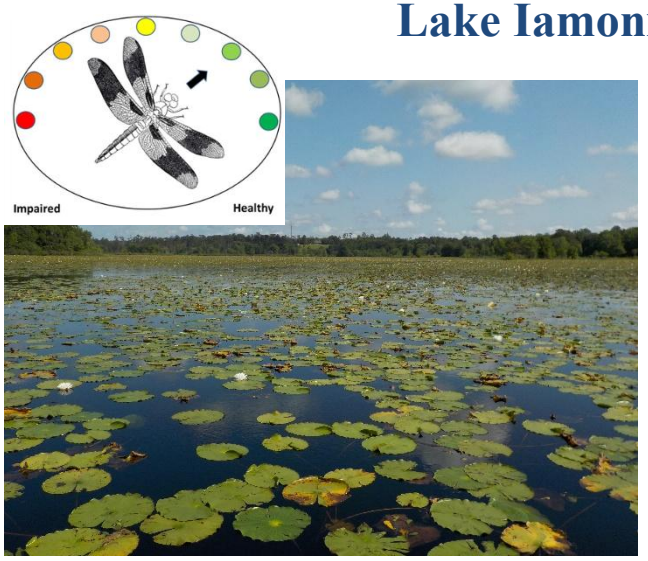


Figure 3. Total nitrogen results for Fisher Creek.

3. Lake Iamonia Basin

Lake Iamonia EcoSummary



Lake Iamonia is an approximately 5,554 acre, shallow, flat-bottomed, phosphorus-limited, prairie lake located in northern Leon County. Drastic water level fluctuations occur from discharge to the sinkhole and receiving floodwaters from the Ochlockonee River. Various control structures have been constructed (and ultimately dismantled) to attempt to control water level fluctuations.

Starting in the early 1900's, various management practices, especially water-level stabilization, and changes in land use, have led to the abundance of aquatic plants and the accumulation of organic sediment in Lake Iamonia which can impede recreational usage and possibly threaten its fish, wildlife, and ecosystem integrity. One of the largest modifications occurred in 1939, when an earthen dam was constructed to isolate the 20-acre sink basin from the lake. Other modifications continued, including the removal of two gates that were formerly used to control water levels. Prior to their removal in 2007, the gates had remained open since 1980, because the Northwest Florida Water Management District deemed the dam to be unsafe for impounding water. These latest modifications have been performed to protect the public and to allow the lake to have more naturally fluctuating water levels. Water quality monitoring continues to be used to evaluate the long-term health of the lake.

Approximately 14% of land use in the 66,727-acre Lake Iamonia basin is agriculture, rangeland, urban, utilities or transportation (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

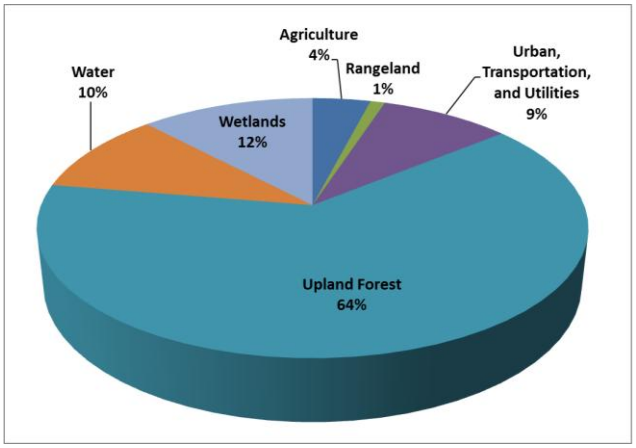


Figure 1. Lake Iamonia watershed land use.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow) and sediment samples are collected annually. Leon County also conducts an annual vegetation survey to evaluate the health of floral (plant) communities in County lakes. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

The nutrient thresholds and results are found in **Table 1**. When data requirements were met, nutrient values did not exceed the state criteria.

Chlorophyll-a data

Water quality samples collected by Leon County are analyzed by Pace Analytical Services – Ormond Beach (Pace), with the analysis results provided back to the County for submission to FDEP. In June 2022, FDEP conducted a routine audit of the chlorophyll-a data. This audit revealed that from October 2014 through December 2020, the chlorophyll-a data was reported as "uncorrected chlorophyll-a" and not "corrected chlorophyll-a", as it should have been. Pace has since rectified this error and beginning in January 2021, the chlorophyll-a data were correctly reported as "corrected chlorophyll-a". The laboratory also provided Leon County with the "correct chlorophyll-a" data from the affected dates and the information in **Table 1** of this year's Report has been changed to reflect this. This has resulted in chlorophyll-a numbers that are lower than past Reports, which in turn has led to changes to the current Report's narrative.

Table 1. NNC Thresholds and Sample Results for Lake Iamonia.

Colored Lakes	Chlorophyll-a 20.0 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	1.7	0.41	0.01
2005	3.9	0.48	0.01
2006	1.8	0.57	0.02
2007	5.0	0.90	0.02
2008	6.1	1.11	0.04
2009	5.8	0.53	0.02
2010	5.6	0.69	0.02
2011-2012*	-	-	-
2013	19.1	0.70	0.04
2014	3.5	0.78	0.03
2015	11.5	0.61	0.04
2016	6.4	0.60	0.02
2017	4.8	0.60	0.02
2018	4.1	0.60	0.03
2019	4.3	0.50	0.02
2020	4.5	0.52	0.02
2021	3.1	0.62	0.03
2022	2.2	0.52	0.02
2023	1.7	0.53	0.02
2024	2.4	0.48	0.02
2025	2.2	0.50	0.02

* Due to low water conditions, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

During the August 2021 sampling event, the chlorophyll-a levels at station IA2 (72.5 µg/L) and station IA4 (221 µg/L) were extremely high

for this lake. Other stations during the same event ranged from 1.0 to 13.6 µg/L. It is unknown why the chlorophyll-a levels varied so much from the other stations, though it is thought that a large clump of algae cells (vs. a uniform water sample) was collected from one or both sites. The result from station IA4 is the highest chlorophyll-a result recorded from Lake Iamonia.

Dissolved Oxygen (DO)

As **Figure 2** shows, Lake Iamonia often did not meet the state DO criteria. This was not unexpected, since all stations are shallow (usually less than 2.0 meters) and are normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake and limits the air/water gas exchange. Plant respiration (samples were often taken in the morning hours) and sediment oxygen demand also contributed to the low DO saturation values. Staff considers this a natural condition for Lake Iamonia.

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Iamonia due to elevated levels of mercury.

Click here for more information about fish consumption advisories in Leon County.

Floral Assessment

The Lake Vegetation Index score for Lake Iamonia was 58, placing the lake's vegetative community in the healthy category.

Fifty-seven species were found during the survey. The native species, fragrant water lily (*Nymphaea odorata*) and fanwort (*Cabomba caroliniana*) were the most dominant species. Other species include red maple (*Acer rubrum*), maidencane (*Panicum hemitomon*), water shield *(Brasenia schreberi*), and American lotus (*Nelumbo lutea*).

Unfortunately, several species of non-native exotic plants were found in Lake Iamonia and are a concern for the future health of the lake. The Florida Exotic Invasive Species Council considers Peruvian primrose willow (*Ludwigia peruviana*) hydrilla (*Hydrilla verticillata*), water hyacinth (*Eichhornia crassipes*), torpedo grass (*Panicum repens*) and Chinese tallow tree (*Sapium sebiferum*) Category I Invasive Exotics and alligator weed (*Alternanthera philoxeroides*) a Category II Invasive Exotic. Water spangles (*Salvinia minima*) and Cuban bulrush (*Oxycaryum cubense*) are additional exotic plants found in the lake. For additional information about Category I and II invasive exotic plants, and other invasive exotics, please go to the Florida Exotic Invasive Species Council: https://www.floridainvasives.org/

Click here for more information on the Lake Iamonia LVI.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Other Parameters

As **Figure 3** shows, biochemical oxygen demand (BOD) levels have and continue to fluctuate over time. As mentioned previously, Lake Iamonia is relatively shallow: average depth to bottom in 2025 was 1.37 meters. The large amount of naturally occurring coarse particulate organic material (CPOM) on the lake bottom is more readily disturbed by wind and wave action in a system as shallow as Lake Iamonia. This led the CPOM to resuspend in the water column, leading

to an increase in potential microbial activity (i.e. higher BOD levels).

Other parameters appeared to be normal for the area, and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Iamonia met the nutrient thresholds for the East Panhandle Region. DO criteria were not met, but staff considers the low DO results a natural condition.

BOD levels continue to fluctuate. The large amount of naturally occurring CPOM on the lake bottom is more readily disturbed by wind and wave action in shallower systems. The shallow water levels led to CPOM resuspending in the water column, leading to an increase in BOD levels.

The LVI score placed the lake's vegetative community in the Healthy category.

Other parameters appeared normal for the area and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites IA2, IA4, IA6, IA7, IA8 and LI1B.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

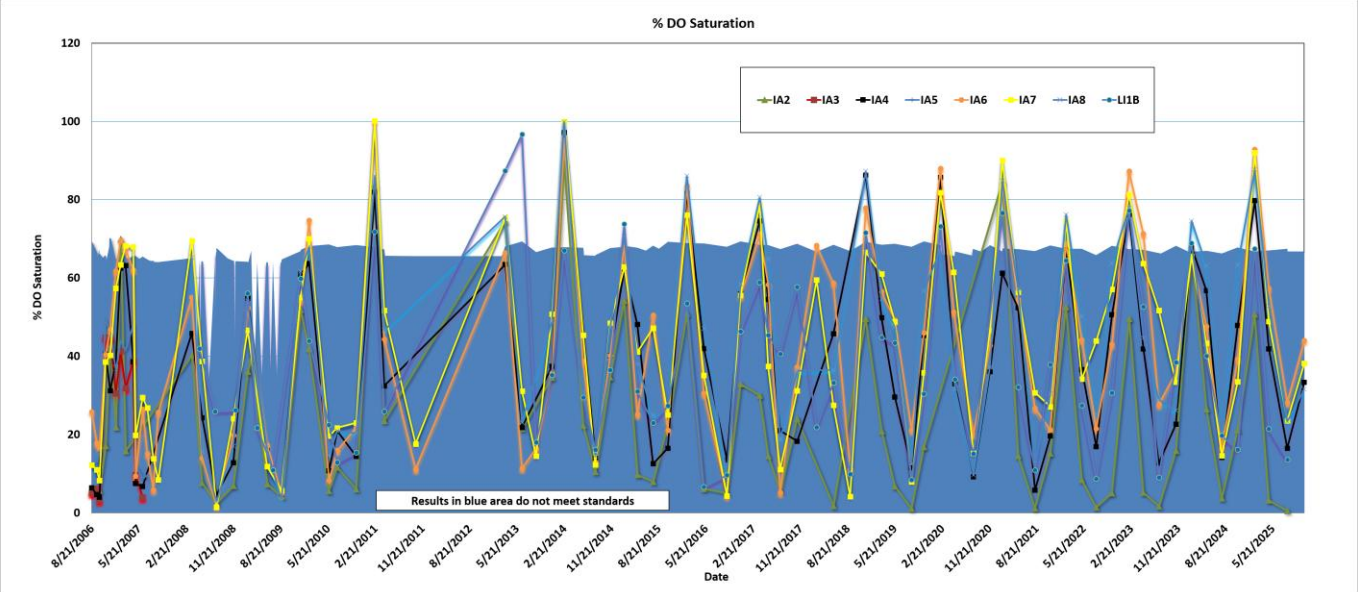


Figure 2. Dissolved Oxygen Percent Saturation results for Lake Iamonia.

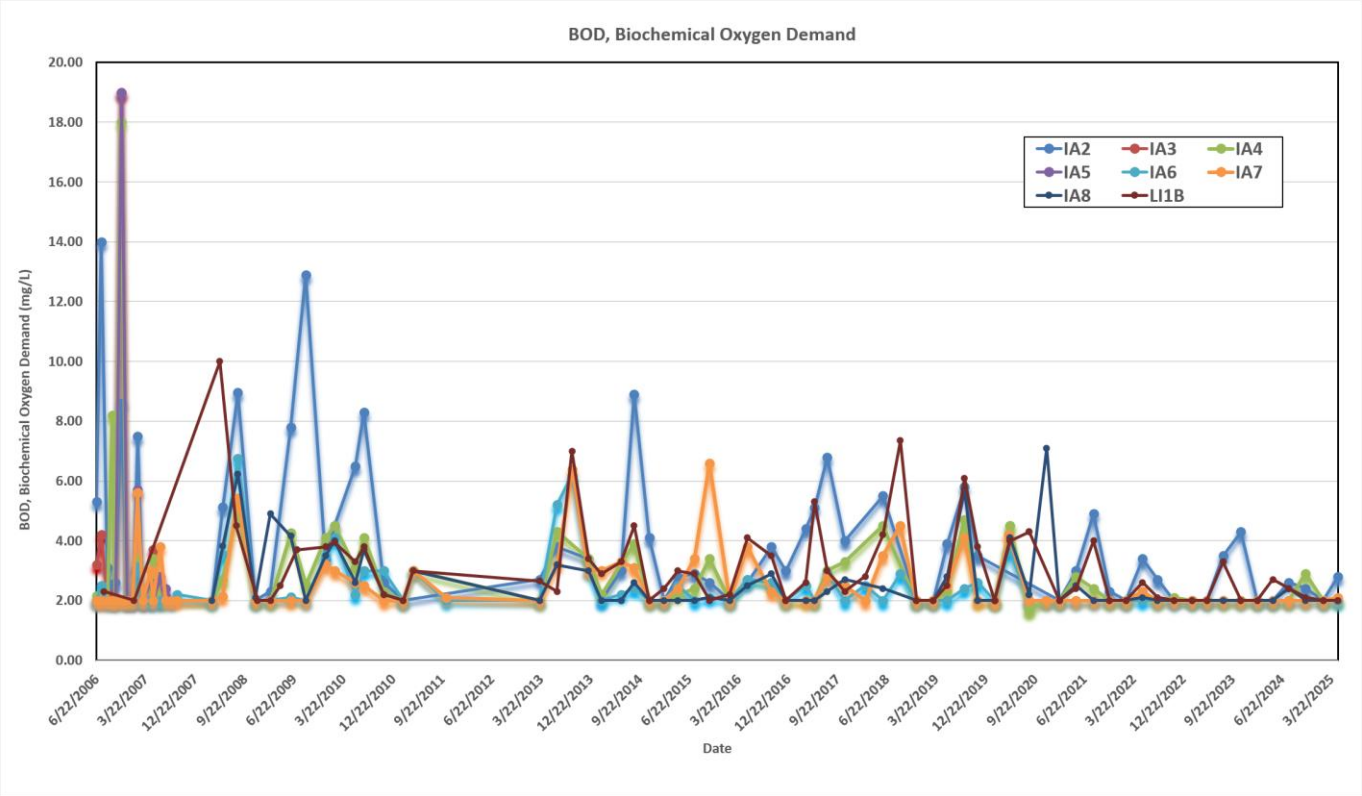


Figure 3. Biochemical Oxygen Demand (BOD) results for Lake Iamonia.

Plantation Stream EcoSummary



Plantation Stream discharges from the Centerville watershed, essentially bounded by Proctor Road and Pisgah Church Road at Centerville Road, continuing west under Thomasville Road, before discharging into Lake Iamonia. The Centerville Conservation Community and Baker Place Subdivisions are located within the watershed. Most of the waterbodies within the watershed are former farm ponds that were used for dairy and other agricultural practices.

Approximately 24% of the 3,996-acre watershed is comprised of agriculture, rangeland, transportation, utilities, and urban and residential uses (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

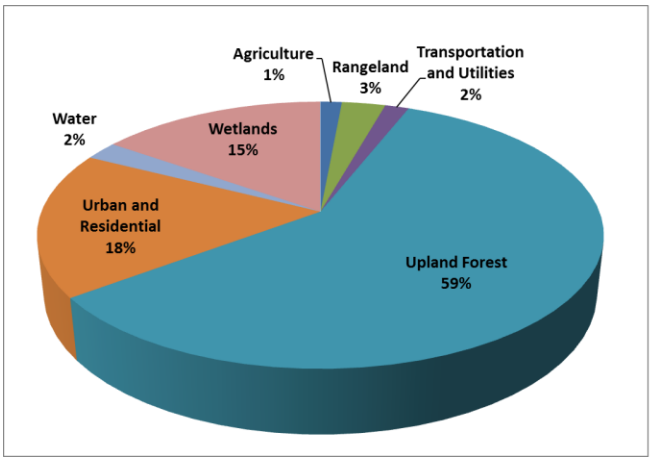


Figure 1. Plantation Stream watershed land use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Plantation Stream and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions and beaver activity, four temporally independent samples per year have been rarely collected.

Nutrients

The nutrient thresholds and results are found in **Table 1**. The NNC has never been exceeded during the period of record.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for total phosphorus or nitrogen.

Table 1. NNC Thresholds and Sample Results for Plantation Stream.

Plantation Stream	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2006- 2007	-	-
2008	0.73	0.09
2009	0.21	0.07
2010	0.61	0.07
2011-2023	-	-
2024	0.42	0.04
2025	-	-

Dissolved Oxygen (DO)

As **Figure 4** shows, Plantation Stream has seldom met the Class III criteria for DO. This is the result of normally lower dissolved oxygen in low gradient, low flow systems like this stream. Another contributing source of naturally lower oxygenated water to this stream is input from a nearby wetland.

Escherichia coli (E. coli)

The *E. coli* water quality limit > 410 in 10% of samples collected over a thirty-day period was exceeded during the 3rd quarter of 2016 (830/100 mL). The elevated *E. coli* levels could have possibly been the result of wildlife or faulty septic tanks in the area. The *E. coli* level has not exceeded water quality standards since.

Metals

Plantation Stream exceeded water quality criteria for iron during the 2nd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring. Staff will continue to evaluate iron levels as additional data becomes available.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on the samples collected, Plantation Stream appeared to meet the nutrient thresholds for the Big Bend Bioregion. While DO results did not always meet Class III water quality standards, low gradient low flow streams normally have lower DO values which, in this case, were further exacerbated by input from the adjacent wetland. Iron exceeded water quality criteria during the 2nd quarter of 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

Other water quality parameters appear to be normal for the area, and no impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 20.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

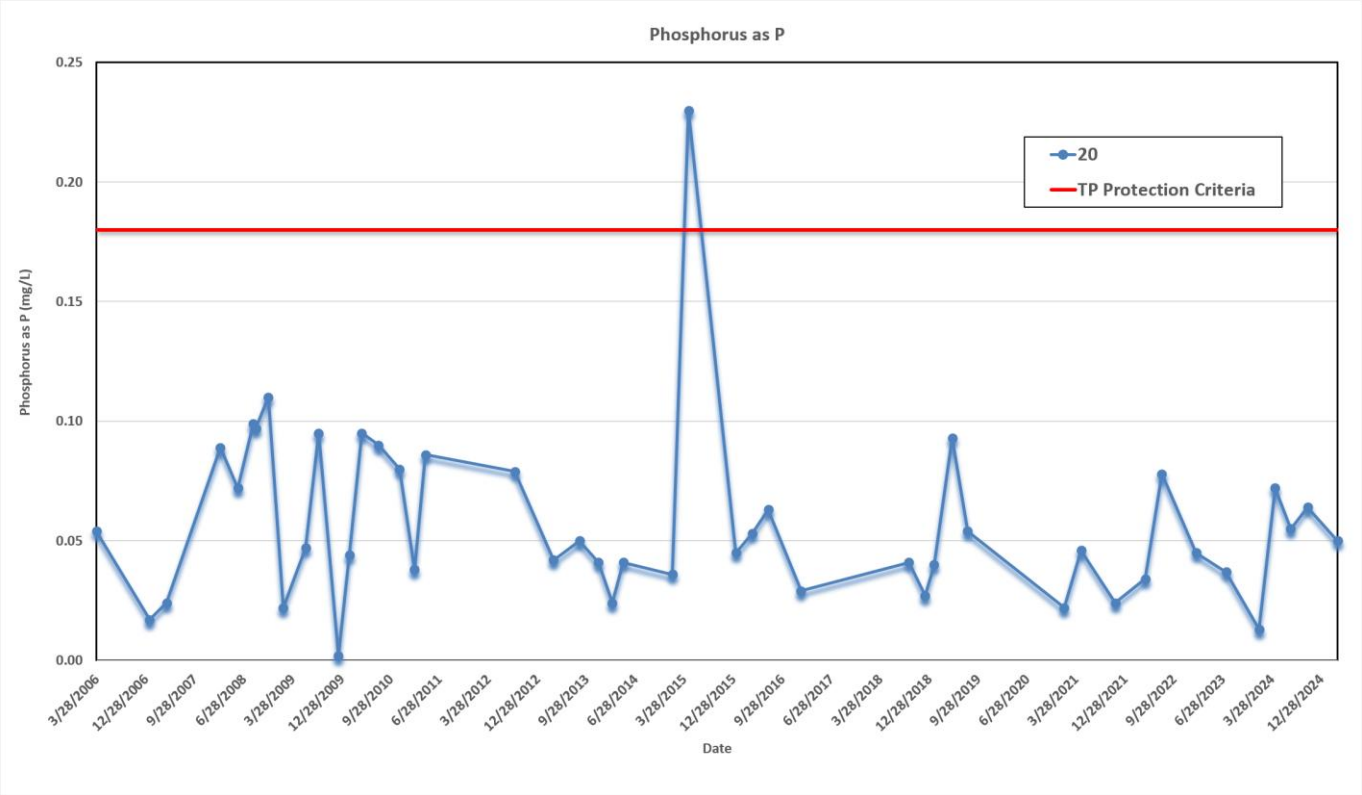


Figure 2. Total Phosphorus results for Plantation Stream.

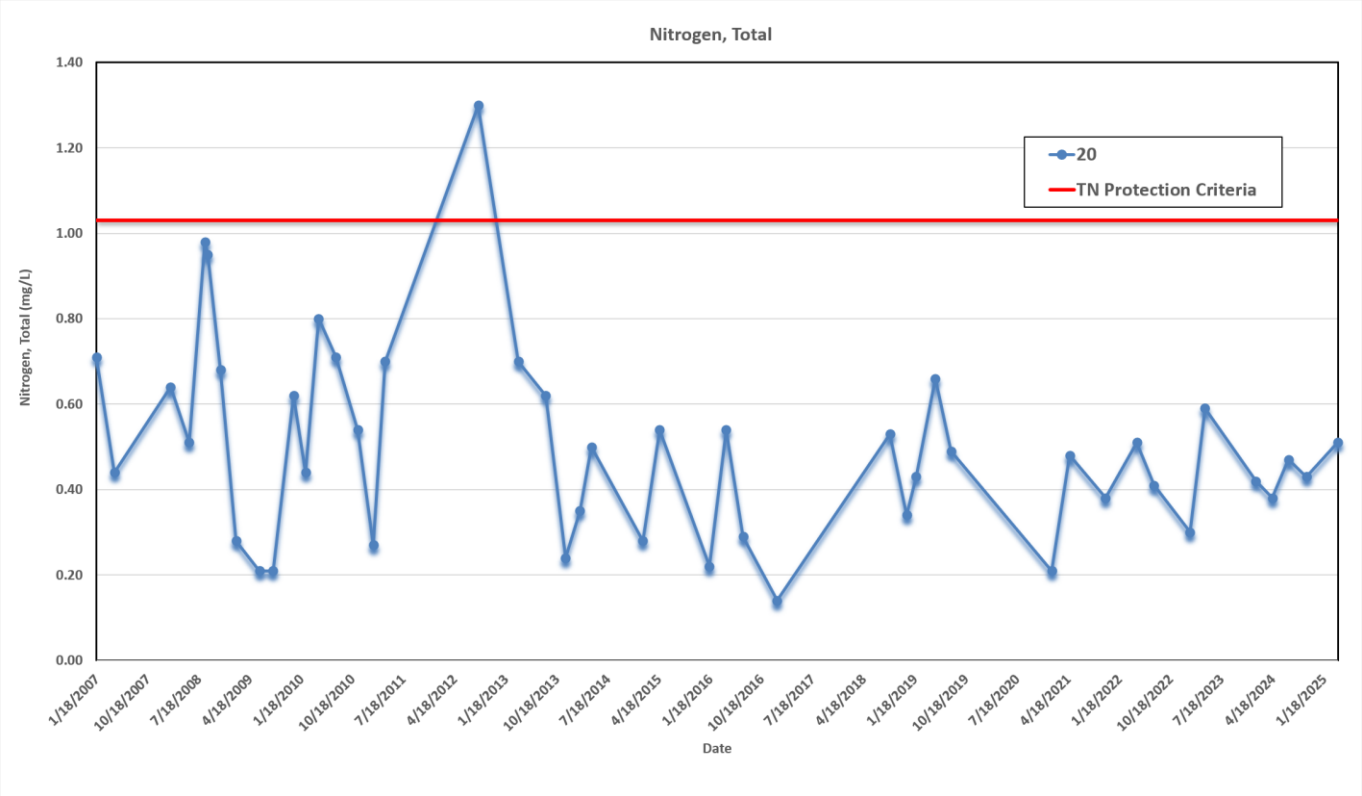


Figure 3. Total Nitrogen results for Plantation Stream.

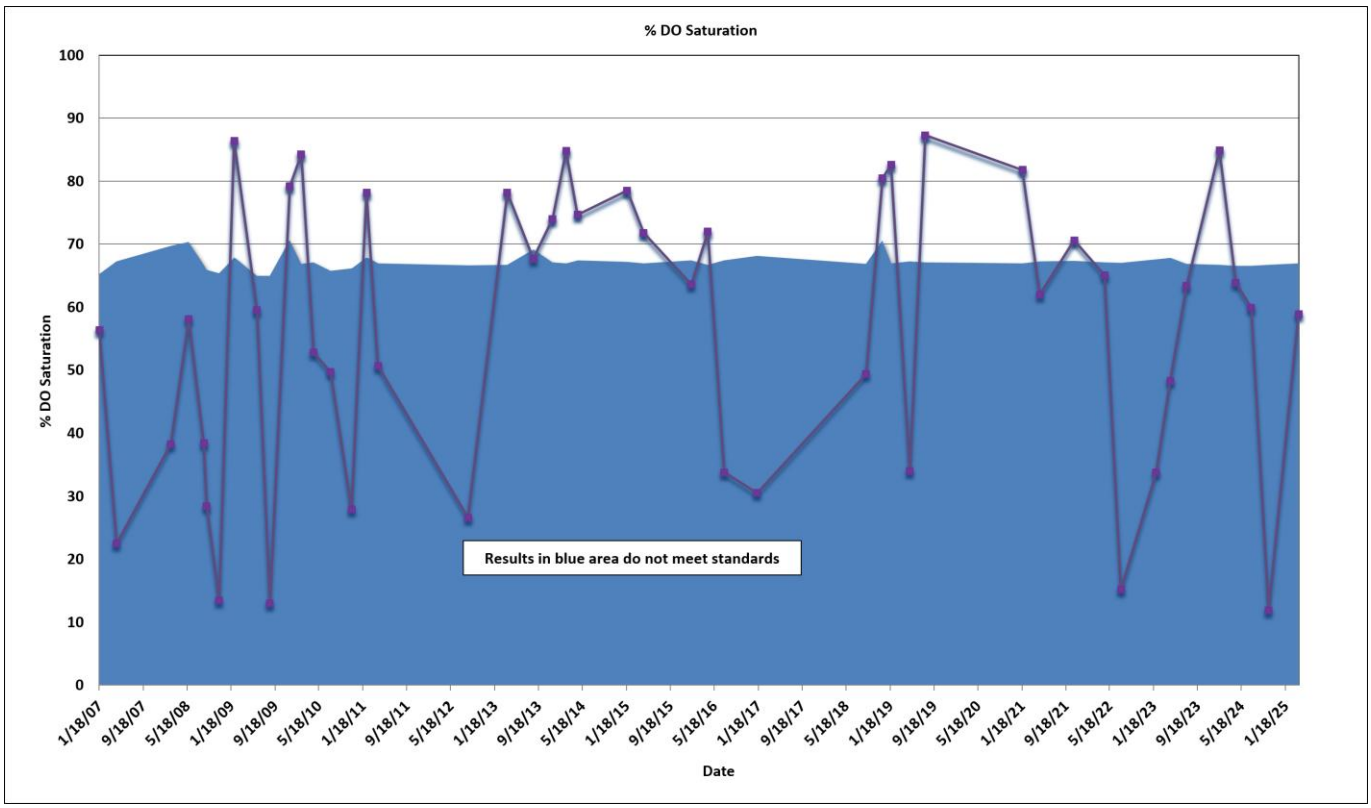


Figure 4. Dissolved Oxygen Percent Saturation results for Plantation Stream.

Tall Timbers Creek EcoSummary



Sitting in a swampy valley surrounded by low hills with the stream channel marked by stepped low elevation waterfalls formed by root masses, Tall Timbers Creek is a tannic stream located in northwestern Leon County. The stream flows south under County Road 12 through the Tall Timbers Research Station and Land Conservancy, eventually entering Lake Iamonia on the north shore of the lake.

Figure 1 shows the majority of the 80-acre watershed upstream of the sample station is relatively undeveloped, with agriculture, urban and residential uses making up approximately 9% of the watershed land uses. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

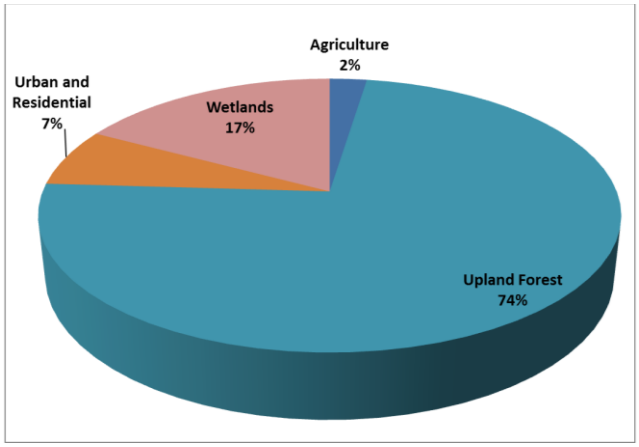


Figure 1. Tall Timbers Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Tall Timbers Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Nutrients

The nutrient thresholds and results are found in **Table 1**. The NNC has never been exceeded during the period of record.

Table 1. NNC Thresholds and Sample Results for Tall Timbers Creek.

Tall Timbers Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2006-2007*	-	-
2008	0.22	0.03
2009	0.17	0.04
2010	0.23	0.04
2011-2012*	-	-
2013	0.11	0.03
2014	0.21	0.02
2015	0.24	0.06
2016	0.13	0.02
2017	0.13	0.03
2018	0.22	0.04
2019	0.28	0.04
2020*	-	-
2021	0.14	0.03
2022	0.18	0.02
2023*	-	-
2024	0.21	0.04
2025*	-	-

* Due to low water conditions, staff could not collect the appropriate number of samples and could not determine the NNC.

Dissolved Oxygen (DO)

As **Figure 2** shows, Tall Timbers Creek seldom met the Class III criteria for DO. Low gradient, tannic streams typically have low DO levels which can be further exacerbated by low water conditions.

Metals

Tall Timbers Creek exceeded water quality criteria for iron during the 1st and 2nd quarters of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring. Staff will continue to evaluate iron levels as additional data becomes available.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

Based on ongoing sampling, Tall Timbers Creek met the nutrient thresholds for the Panhandle East Region. While DO results did not meet Class III water quality standards, low gradient tannic streams normally have lower DO values which, in this case, were further exacerbated by the typically low flow conditions. Water quality criteria for iron was exceeded during the 1st and 2nd quarters of 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 66.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

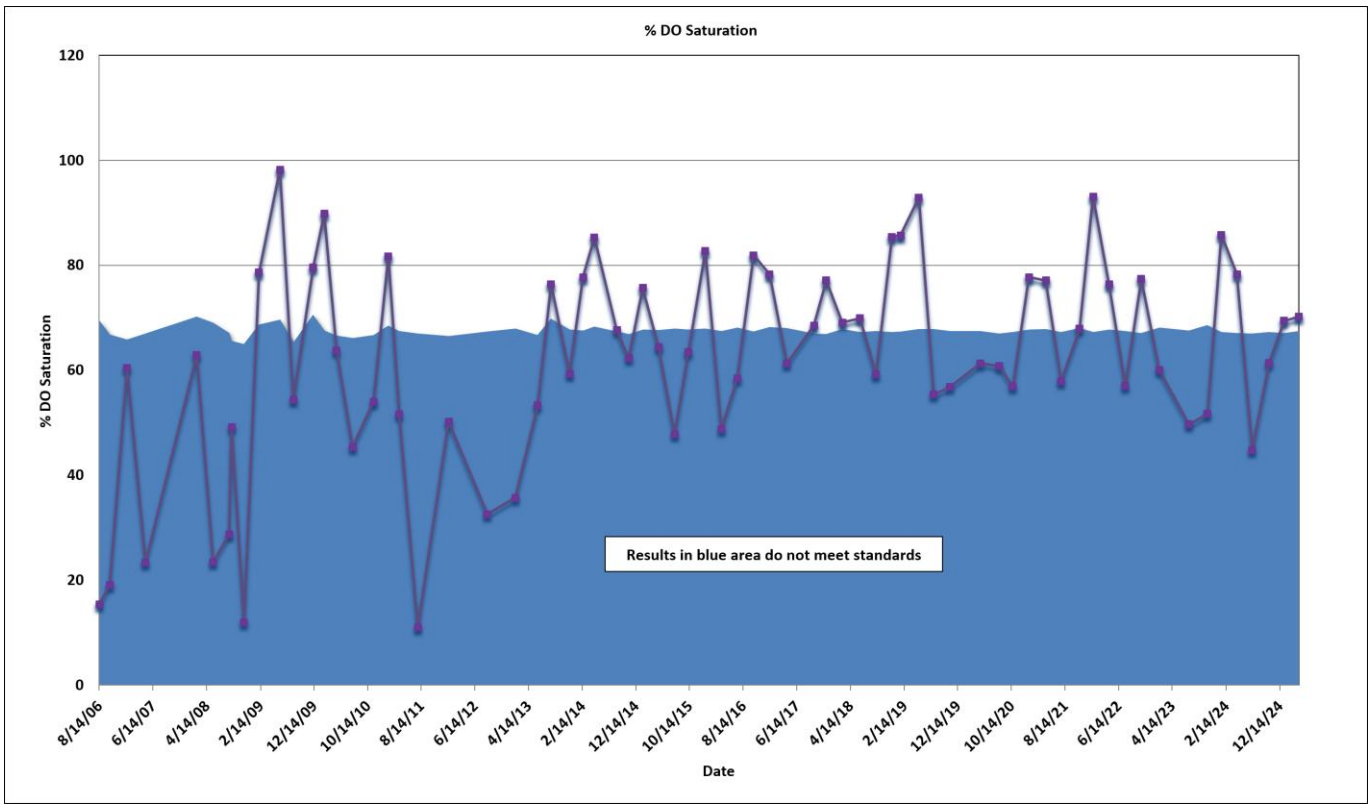
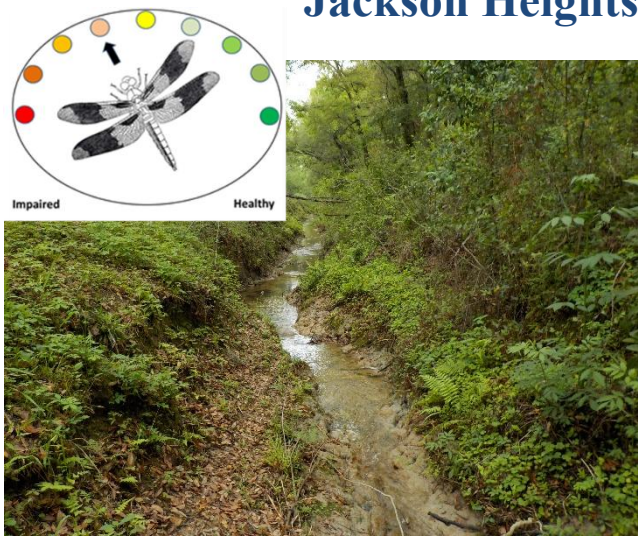


Figure 2. Dissolved Oxygen Percent Saturation results for Tall Timbers Creek.

4. Lake Jackson Basin

Jackson Heights Creek EcoSummary



Jackson Heights Creek is a heavily altered stream located off Hwy 27 in northern Leon County. The stream receives runoff from the Parkhill and Greenwood Hills subdivisions, and then continues north through Lake Jackson Heights and Harbinwood subdivisions before finally entering Lake Jackson. This watershed, with residential development dating from the 1950's, displays impacts from channelized flow and aging septic tanks. Sampling was intermittent from February 2007 through October 2008, due to low flow conditions and stormwater facility construction in the channel. The stormwater facility was constructed to mitigate development impacts and to benefit both the creek and Lake Jackson.

A sinkhole opened upstream of Jackson Heights Creek in a County stormwater facility in December 2018, causing low water conditions downstream of the feature. Because of the conditions, Leon County staff only collected one water quality sample in 2019 (January 24th). The sinkhole was filled, and the repairs completed in March 2020.

As shown in **Figure 1**, transportation, utilities, urban and residential land uses make up approximately 79% of the 459-acre watershed. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

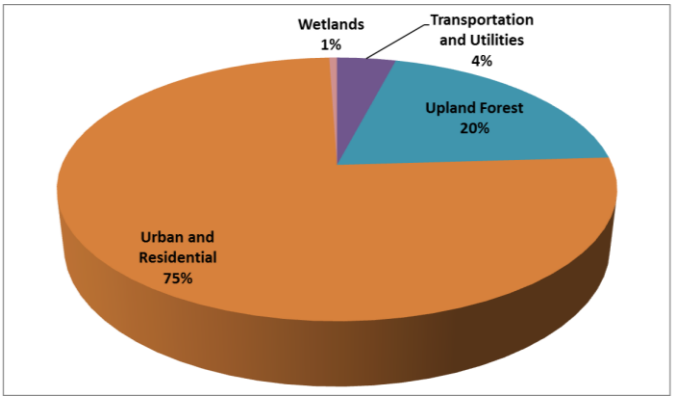


Figure 1. Jackson Heights Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

In late 2006, the U.S. Environmental Protection Agency (USEPA) set a TMDL target for Total Phosphorus of 0.15 mg/L, a 35% reduction of the previous existing concentration of 0.23 mg/L.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Jackson Heights Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period. Due to low water conditions, four temporally independent samples per year could not always be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

The NNC thresholds and results are found in **Table 1**. When sampling conditions were met, NNC thresholds were never exceeded during the period of record. However, the 2024 geometric mean is at the threshold, and is the highest result since 2009.

As mentioned previously, the USEPA set a TMDL target for total phosphorus of 0.15 mg/L, a 35% reduction of the previous existing concentration of 0.23 mg/L. During the 2006-2025 sampling period, total phosphorus concentrations ranged from 0.036 mg/L to 0.32 mg/L (**Figure 2**), with an arithmetic mean of 0.13 mg/L. While overall phosphorus levels are still below the TMDL, results suggested that levels appeared to be increasing and are a cause of concern. Staff concerns prompted the inspection of the upstream Jackson Heights Creek stormwater management facilities, and the decision was made to perform major maintenance on the facilities. It was staff's belief that phosphorus levels would drop with the completion of the facilities' maintenance. Total phosphorus values in 2022 did drop to levels below the TMDL. Total phosphorus results continue to fluctuate, with the last three sampling events results either at or below the TMDL.

Table 1. NNC thresholds and sample results for Jackson Heights Creek.

Jackson Heights Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2009	0.38	0.09
2010	0.56	0.12
2011-2012*	-	-
2013	0.30	0.08
2014	0.32	0.09
2015*	-	-
2016	0.43	0.10
2017	0.39	0.09
2018	0.43	0.16
2019-2020*	-	-
2021	0.69	0.14
2022-2023*	-	-
2024	0.48	0.18
2025*	-	-

* Due to low water conditions, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

Escherichia coli (E. coli)

As **Figure 3** shows, *E. coli* levels continue to be a problem and exceeded the Class III water quality standard daily limit of > 410 in 10% threshold value of samples collected over a 30-

day period. Aging septic tanks, leaking sewer pipes or animal/pet waste could be contributing to the elevated *E. coli* levels in the creek. There were no exceedances in 2025.

Other Parameters

Several species of exotic plants line the bank of Jackson Heights Creek, primarily wild taro (*Colocasia* sp.). In many cases, exotic plants will crowd out and replace native plants. This may stress native wildlife, which has evolved to depend on native plants for food and shelter. The native wildlife may move away or perish if the native vegetation is replaced by exotic plants.

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

Based on ongoing sampling, Jackson Heights Creek continues to meet the NNC for the East Panhandle Region. Several species of exotic plants line the bank of Jackson Heights Creek which may affect native wildlife dependent on native plants for food and shelter. Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 31.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

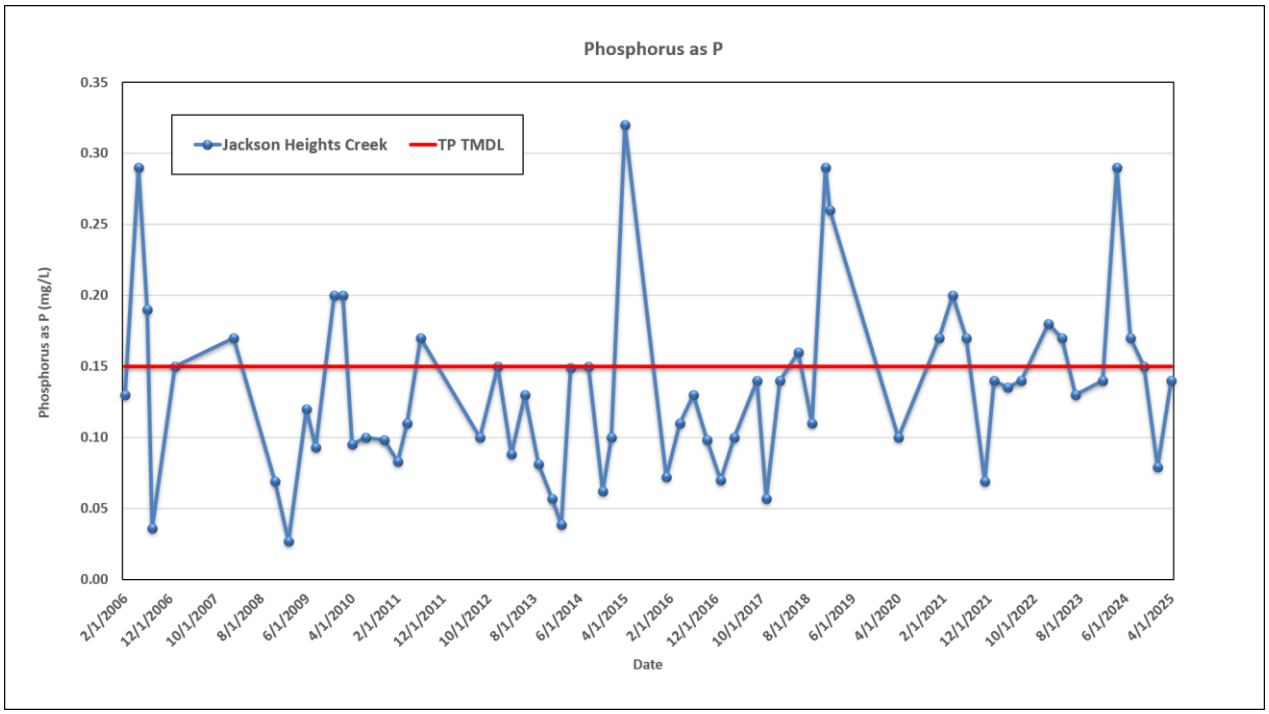


Figure 2. Total Phosphorus results for Jackson Heights Creek.

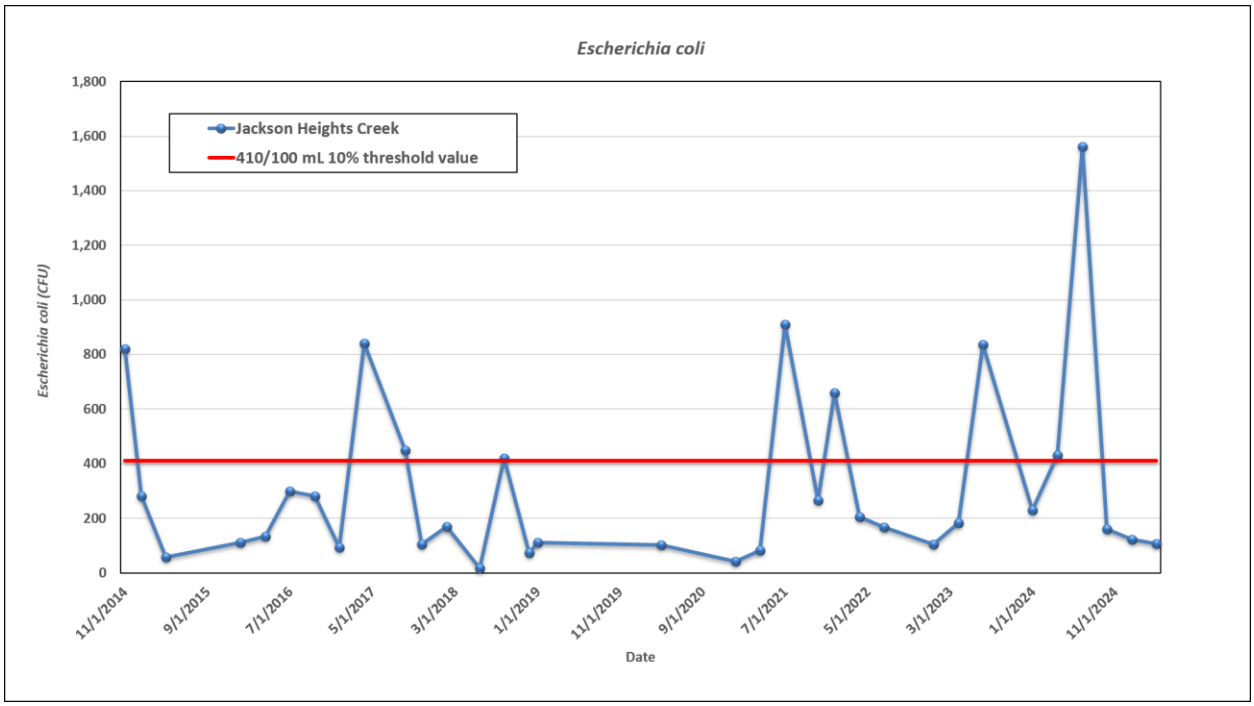
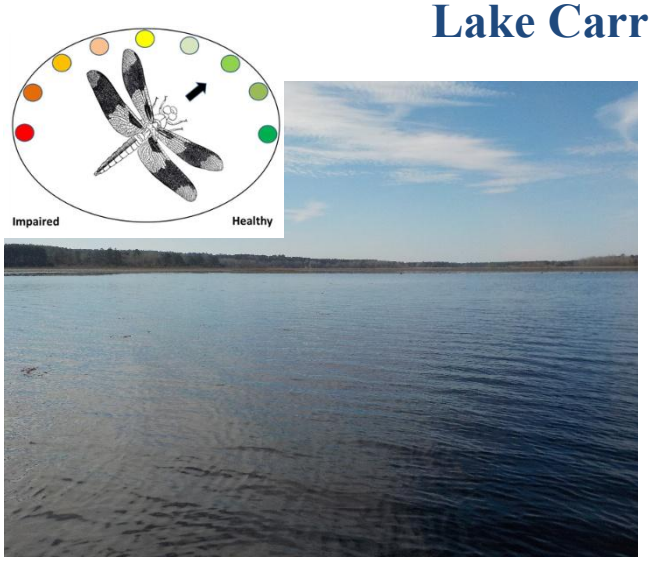


Figure 3. *E. coli* results for Jackson Heights Creek.

Lake Carr EcoSummary



Lake Carr is an approximately 880 acre, primarily phosphorus-limited, shallow lake located north of Lake Jackson and is essentially surrounded by two property owners: Ayavalla Land Company and Orchard Pond LLC. Lake Carr is a valuable biological, aesthetic and recreational resource of Leon County and was designated as an Aquatic Preserve in 1973 for the primary purpose of preserving and maintaining the biological resources in their natural condition.

As shown in **Figure 1**, 38% of land uses in the 5,931-acre Lake Carr watershed are agriculture, rangeland, transportation, utilities, urban and residential. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads. The lake receives direct runoff from the surrounding agricultural property as well as flow from the residential areas east of Meridian Road (Summerbrooke and Ox Bottom Manor). Waterbodies in the residential areas are modified farm ponds serving as stormwater facilities dedicated to the respective home-owner's associations for maintenance. The Summerbrooke Golf Club (157 acres) also lies in this watershed.

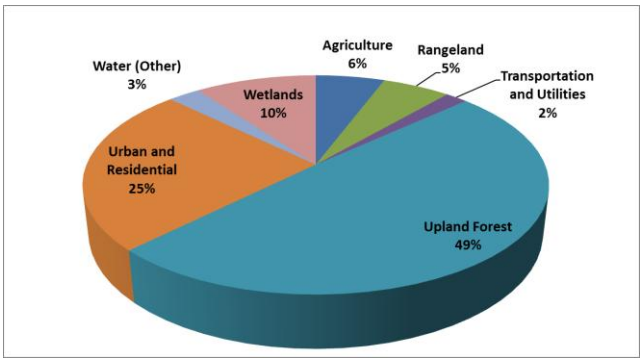


Figure 1. Lake Carr watershed land use.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow) and sediment samples are collected annually. Leon County also conducts an annual vegetation survey to evaluate the health of floral (plant) communities in the County lakes. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Water quality results and thresholds are found in **Table 1**. Since 2004, there have been no exceedances of the NNC.

Dissolved Oxygen

As **Figure 2** shows, station CA1 dissolved oxygen (DO) percent saturation values did not meet Class III water quality criteria while station CA2 failed to meet the criteria four times during the sampling period. This was not unexpected, since the CA1 station is a shallow station normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake. Plant respiration (samples were often taken in the morning hours) also contributed to the low DO saturation values. While there is a substantial community of submerged vegetation at the CA2 station, emergent vegetation is relatively uncommon at this site, so conditions are more optimal for rapid water exchange with the remainder of the lake. Staff believes that this is a natural condition for both locations.

Floral Assessment

The Lake Vegetation Index score for Lake Carr was 62, placing the lake's vegetative community in the healthy category.

Table 1. NNC thresholds and sample results for Lake Carr.

Clear Lake, Low Alkalinity	Chlorophyll-a 6.0 µg/L	TN Threshold 0.51-0.93 mg/L	TP Threshold 0.01-0.03 mg/L
2004	1.3	0.29	0.01
2005	1.4	0.27	0.01
2006	1.1	0.39	0.01
2007	2.2	0.61	0.02
2008	4.6	0.64	0.02
2009	4.8	0.50	0.02
2010	5.5	0.49	0.02
2011	5.2	0.44	0.01
2012-2013*	-	-	-
2014	1.2	0.35	0.01
2015	3.3	0.30	0.02
2016	2.4	0.28	0.01
2017	2.2	0.36	0.01
2018	2.2	0.31	0.01
2019	2.7	0.27	0.01
2020	1.5	0.71**	0.01
2021*	-	-	-
2022	1.0	0.30	0.01
2023*	-	-	-
2024	1.2	0.31	0.01
2025	1.5	0.43	0.12

* Due to low water conditions, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.
** May 5, 2020, sample contaminated.

Forty-one plant species were found during the survey. The native species, and fragrant waterlily (*Nymphaea odorata)* and fanwort (*Cabomba caroliniana*) were the most dominant plants in the lake.

Other native vegetation included American lotus (*Nelumbo lutea*), leafy bladderwort (*Utricularia foliosa*), and pickerelweed (*Pontederia cordata*).

Unfortunately, several species of non-native exotic plants were found in Lake Carr and are a concern for the future health of the lake. The Florida Exotic Invasive Species Council considers torpedo grass (*Panicum repens*), hydrilla (*Hydrilla verticillata*), and water hyacinth (*Eichhornia crassipes*) Category I Invasive Exotics and alligator weed (*Alternanthera philoxeroides*) a Category II Invasive Exotic. Cuban bulrush (*Oxycaryum cubense*) is an additional exotic found in the lake. For additional information about Category I and II invasive exotics and other non-native exotic plants, please go to the Florida Exotic Invasive Species Council:
https://www.floridainvasives.org/

Click here for more information on the Lake Carr LVI.

For additional information about the LVI please go to the Florida Department of Environmental Protection webpage:
https://floridadep.gov/dear/bioassessment/content/bioassessment-methods#Lakes

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, Lake Carr met the NNC for the East Panhandle Region. Staff consider the DO results at Stations CA1 and CA2 a natural condition. The LVI score for Lake Carr placed the lake's vegetative community in the Healthy category.

Other water quality parameters appear to be normal for the area and no impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site CA2.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

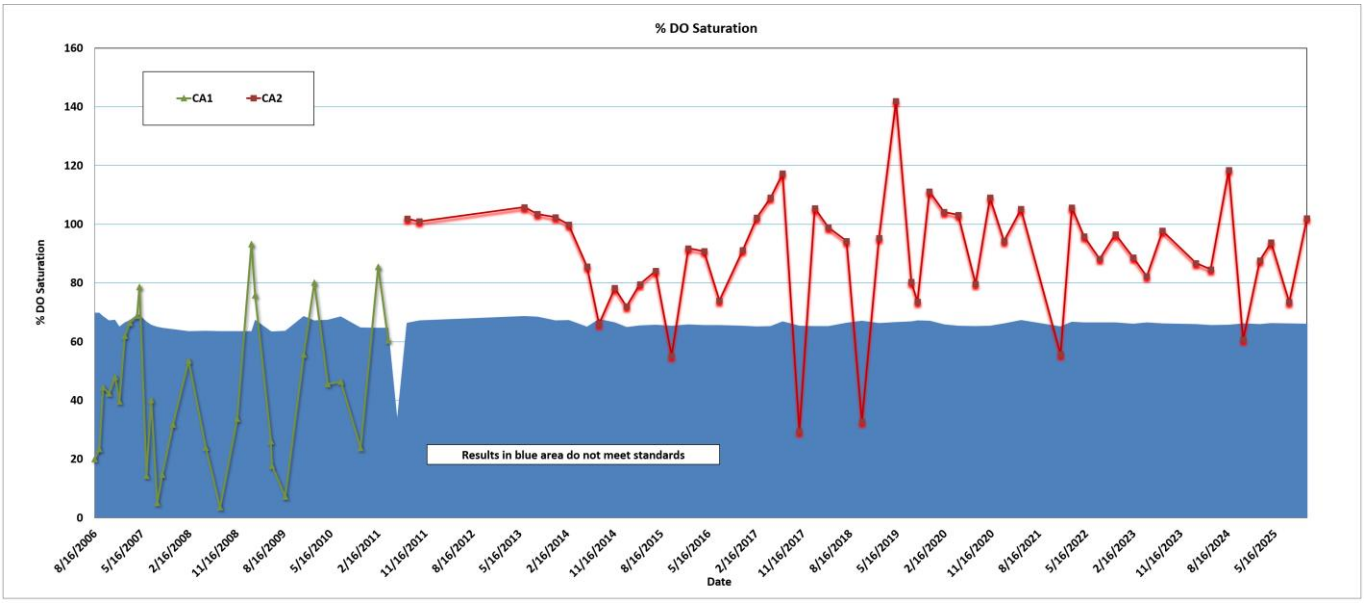
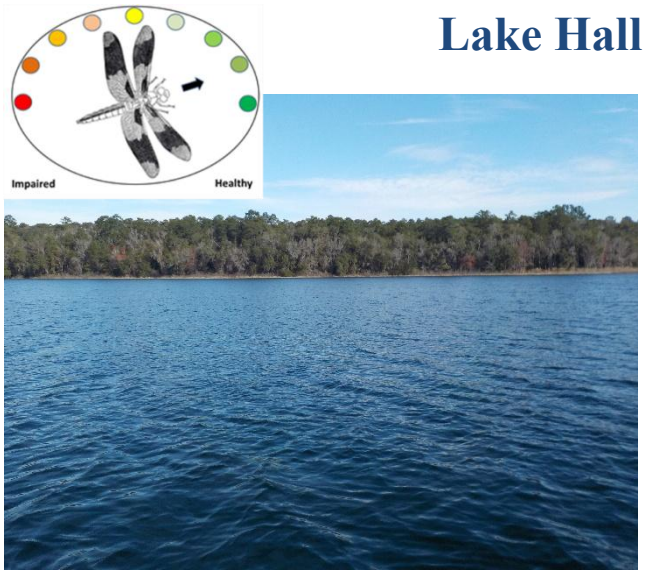


Figure 2. Dissolved Oxygen Percent Saturation results for Lake Carr.

Lake Hall EcoSummary



Lake Hall is an approximately 182-acre lake located in northern Leon County, just north of Interstate 10 and slightly west of U.S. Highway 319. Lake Hall is part of the Alfred B. Maclay Gardens State Park, a state recreation area and botanical garden, and is declared an "Outstanding Florida Waters" by the Florida Department of Environmental Protection (FDEP).

Approximately 45% of land uses in the 773-acre Lake Hall watershed are transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

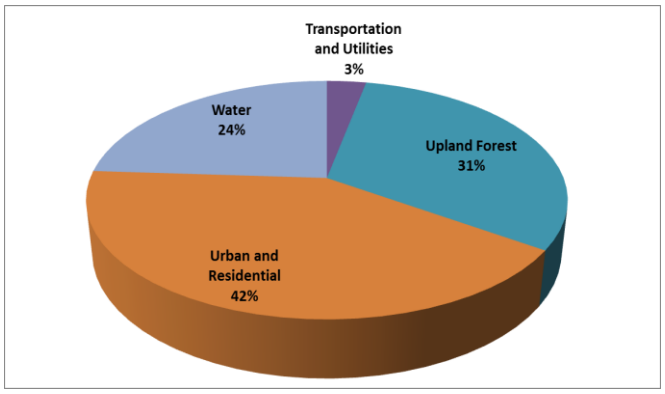


Figure 1. Lake Hall watershed land use.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow) and sediment samples are collected annually. Leon County also conducts an annual vegetation survey to evaluate the health of floral (plant) communities in the County lakes. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly

samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Water quality results and thresholds are found in **Table 1**. Since 2004, there have been no exceedances of the NNC.

Table 1. NNC thresholds and sample results for Lake Hall.

Clear Lake, Low Alkalinity	Chlorophyll-a 6.0 µg/L	TN Threshold 0.51-0.93 mg/L	TP Threshold 0.01-0.03 mg/L
2004	2.1	0.13	0.01
2005	1.4	0.22	0.01
2006	1.3	0.22	0.01
2007	1.5	0.42	0.01
2008	2.2	0.33	0.00
2009	1.8	0.43	0.00
2010	2.2	0.33	0.01
2011	1.3	0.41	0.01
2012	1.4	0.34	0.01
2013	3.0	0.15	0.01
2014	1.4	0.26	0.01
2015	2.9	0.26	0.02
2016	3.5	0.32	0.01
2017	2.8	0.32	0.01
2018	2.6	0.31	0.01
2019	2.2	0.26	0.01
2020*	-	-	-
2021	1.3	0.30	0.01
2022	1.2	0.34	0.01
2023	1.3	0.38	0.01
2024	1.3	0.30	0.02
2025	1.4	0.38	0.01

* Due to access restrictions associated with the COVID-19 pandemic, staff could not access the lake during the 2nd quarter of 2020 and thus could not determine the NNC for 2020.

Due to access restrictions associated with the COVID-19 pandemic, staff could not access the lake during the 2nd quarter of 2020 and thus could not determine the NNC for 2020.

Floral Assessment

The Lake Vegetation Index score for Lake Hall was 73, placing the lake's vegetative community in the healthy category.

Forty-one species were found during the survey. The native species, watershield (*Brasenia schreberi*), and fragrant waterlily (*Nymphaea odorata*) were the most dominant species in the lake. Other native vegetation included red maple (*Acer rubrum*), fanwort (*Cabomba caroliniana*), and buttonbush (*Cephalanthus occidentalis*).

Unfortunately, three species of non-native exotic plants were found in Lake Hall and are a concern for the future health of the lake. The Florida Exotic Invasive Species Council considers the exotic Chinese tallow tree (*Sapium sebiferum*) and hydrilla (*Hydrilla verticillata*) Category I Invasive Exotics. Another invasive exotic, burhead sedge (*Oxycaryum cubense*) was also found in the lake. For information about Category I invasive exotics and other invasive non-native plants, please go to the Florida Exotic Invasive Species Council: https://www.floridainvasives.org/

Click here for more information on the Lake Hall LVI.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Other parameters

Other water quality parameters appeared to be normal for the area, and no impairments were noted.

Conclusions

Based on ongoing sampling, Lake Hall met the nutrient thresholds for the Eastern Panhandle Region and the floral community is considered "Healthy" by the LVI. Other water quality parameters appeared to be normal for the area and no impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

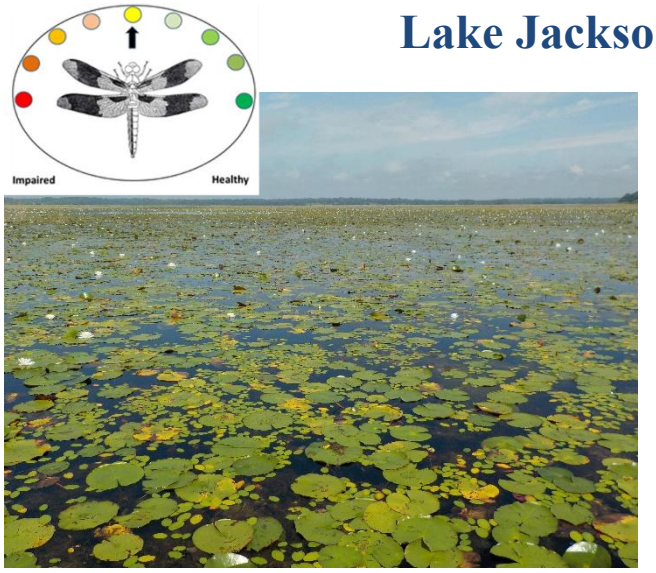
www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site H07.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Lake Jackson EcoSummary



Lake Jackson is an approximately 4,254 acre, shallow, flat-bottomed, prairie lake with two major sinkholes and is located north of the City of Tallahassee. Lake Jackson is a valuable biological, aesthetic, and recreational resource of Leon County and was designated (along with the neighboring Lake Carr and Mallard Pond) as an Aquatic Preserve in 1973 for the primary purpose of preserving and maintaining the biological resources in their natural condition.

The aforementioned sinkholes are sources of extreme water loss in the lake over the past several decades. Normally, the sinkholes are plugged with sediments, but will collapse when groundwater levels drop, allowing the lake water to enter the aquifer, often dramatically lowering the lake water level.

Click here for more information about the latest Lake Jackson dry down.

Approximately 40% of land use in the 27,096-acre Lake Jackson Basin is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

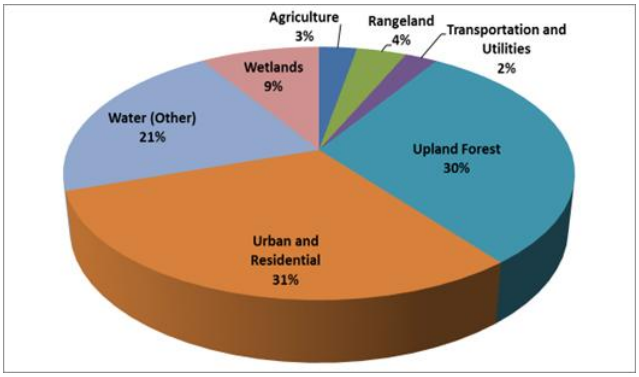


Figure 1. Lake Jackson watershed land use.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

When field conditions allow, surface water samples are collected quarterly, and sediment samples are collected annually. Leon County also conducts an annual vegetation survey to evaluate the health of floral (plant) communities in the County lakes. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Low water levels caused by drought and sinkhole activity meant certain water quality stations could not be sampled during some months. The latest low water level event began in the latter half of 2020 with the lake completely draining through the Porter sinkhole in June 2021. Due to low water levels, sampling did not occur for the last three quarters of 2021 and the entire 2022-2023 calendar years. Sampling resumed in 2024 and continued through the 3rd quarter of 2025. Low water levels during the 4th quarter of 2025 prevented sampling for the rest of the year. Objective results of nutrient concentration continued to be skewed by water level fluctuations. The effects of water level fluctuation continue to be documented.

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

The nutrient thresholds and results are found in **Table 1**. Chlorophyll-a, total phosphorus and nitrogen levels were exceeded during some years over the sampling period. During the August 2025 sampling event, and because of an algal bloom, station J05 had extremely high chlorophyll-a (83.7 µg/L) biochemical oxygen demand (19.0 mg/L), total nitrogen (1.9 mg/L), and total phosphorus (0.22 mg/L) results.

Dissolved Oxygen

As **Figure 2** shows, several Lake Jackson stations showed dissolved oxygen (DO) percent saturation values that did not meet Class III water quality criteria. This was not unexpected, since the Lake Jackson stations are shallow stations normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake. Plant respiration (samples were often taken in the morning hours), in addition to organic rich sediments, also contributed to the low DO saturation values.

Table 1. NNC thresholds and sample results for Lake Jackson. Results in bold signify exceedances of the State criteria.

Clear Lake, Low Alkalinity	Chlorophyll-a 6.0 µg/L	TN Threshold 0.51-0.93 mg/L	TP Threshold 0.01-0.03 mg/L
2004	2.2	0.33	0.01
2005	3.2	0.29	0.03
2006	3.0	0.63	0.03
2007	2.1	0.77	0.03
2008	5.7	0.60	**0.04**
2009	**8.4**	0.49	**0.02**
2010	3.2	0.58	0.02
2011	**6.9**	**0.61**	**0.02**
2012-2013*	-	-	-
2014	2.3	0.69	0.02
2015	**6.8**	**0.54**	**0.03**
2016	5.3	0.47	0.02
2017	4.2	0.56	0.02
2018	3.2	0.50	0.02
2019	5.1	0.54	0.03
2020	3.0	0.54	0.03
2021-2023*	-	-	-
2024	2.5	0.61	**0.05**
2025	-	-	**-**

* Due to low water conditions, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

Floral Assessment

The Lake Vegetation Index score for Lake Jackson was 59, placing the lake's vegetative community in the healthy category.

Forty-one species were found during the survey. The native species, watershield (*Brasenia schreberi*), fragrant waterlily (*Nymphaea odorata*) as well as the Category I Invasive Exotic hydrilla (*Hydrilla verticillata*) were the most dominant species in the lake. Other native vegetation included red maple (*Acer rubrum*), fanwort (*Cabomba caroliniana*), and buttonbush (*Cephalanthus occidentalis*).

Unfortunately, several species of non-native exotic plants were found in Lake Jackson and are a concern for the future health of the lake. The Florida Exotic Invasive Species Council considers the exotic water hyacinth (*Eichhornia crassipes*), torpedo grass (*Panicum repens*), and the aforementioned hydrilla (*Hydrilla verticillata*) Category I Invasive Exotics. Alligator weed (*Alternanthera philoxeroides*), and rattlebox (*Sesbania punicea*) are Category II Invasive Exotics that were found in Lake Jackson. While less environmental damaging, the invasive exotics, burhead sedge (*Oxycaryum cubense*) and water spangles (*Salvinia minima*) were also found in the lake. For information about Category I and II invasive exotics and other invasive non-native plants, please go to the Florida Exotic Invasive Species Council: https://www.floridainvasives.org/

Click here for more information on the Lake Jackson LVI.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Jackson due to elevated levels of mercury.

Click here for more information about fish consumption advisories.

Metals

Station J05 exceeded water quality criteria for iron during the 1st and 3rd quarters of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. As iron is a parameter recently added to the sampling program, few samples have been collected and conclusions on the information collected are tentative. It appears that iron levels, at least in part, appear to be naturally occurring. Staff will continue to evaluate iron levels as additional data becomes available.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Jackson NNC for chlorophyll-a, total phosphorus and nitrogen levels were exceeded during certain years. Ongoing sampling showed percent dissolved oxygen (DO) saturation values did not always meet Class III water quality criteria. This was not unexpected, since the Lake Jackson stations are shallow stations normally covered with vegetation, preventing rapid water/atmospheric

exchange. Plant respiration and organic-rich sediment also contributed to low DO saturation values. Due to an algal bloom, Station J05 had high chlorophyll-a, BOD, and nutrient results during the 3rd quarter sampling event. Station J05 exceeded water quality criteria for iron during the 1st and 3rd quarters of 2025. It appears that iron levels, at least in part, appear to be naturally occurring. The LVI score placed the lake's vegetative community in the Healthy category.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites J03, J05, J14 and J16.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

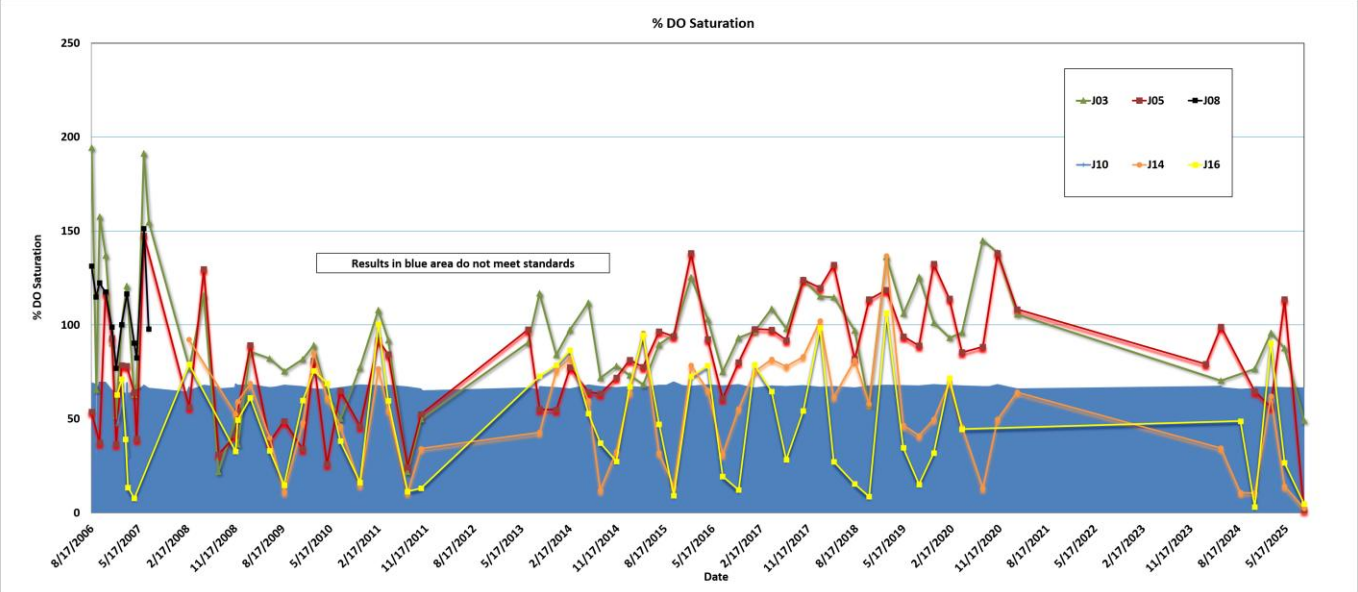
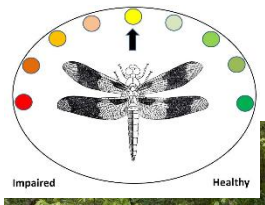


Figure 2. Dissolved Oxygen Percent Saturation results for Lake Jackson.

Lexington Creek EcoSummary





Lexington Creek is a moderately altered stream located in the northern part of Tallahassee and drains into the Fords Arm of Lake Jackson. The watershed extends to Thomasville Road at I-10 on the east and is bounded by Maclay Road and Live Oak Plantation Road on the north and south, respectively.

As shown in **Figure 1**, agriculture, rangeland, transportation, utilities, urban and residential uses make up approximately 69% of the 1,786-acre watershed. Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

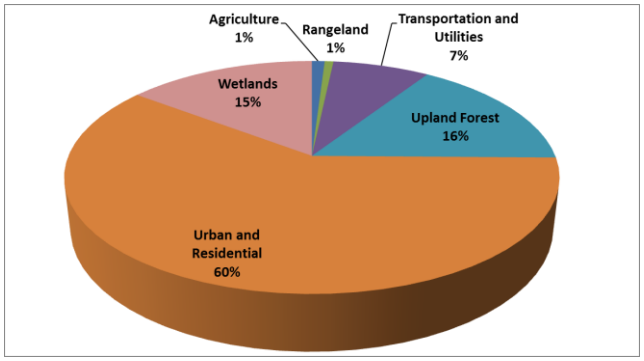


Figure 1. Lexington Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

To reduce flooding where Lexington Creek crosses under Meridian Road, Leon County improved drainage by installing large box culverts to move water beneath the roadway. Such improvements are also expected to better treat stormwater and reduce soil erosion, improving the health of adjacent wetlands and Lake Jackson.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Lexington Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions over the sampling period and to construction associated with the drainage improvements to Meridian Road (latter part of 2020), four temporally independent samples per year could not be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

Nutrients

The nutrient thresholds and results are found in **Table 1**. The NNC for phosphorus exceeded the threshold in 2018, 2019, and 2021.

This is not completely unexpected. Individual values were sometimes elevated during the sampling period (**Figure 2**). For example, due to a rainfall event that flushed phosphorus-laden sediment into the creek, the August 2012 Total phosphorus value (1.3 mg/L) was substantially higher than all other phosphorus values recorded at this site.

Total nitrogen results over the entire sampling period did not exceed FDEP's 1.03 mg/L threshold value. But individual nitrogen levels have occasionally been exceeded since sampling began (**Figure 3**). One exceedance occurred during the same previously mentioned August 2012 sampling event (1.7 mg/L); others include the November 2008 sampling event (1.1 mg/L), and the January 2022 sampling event (3.4 mg/L).

The unusually high nitrogen and phosphorus levels during the August 2012 event can be attributed to stormwater runoff associated with the heavy rainfall in the area prior to the sampling event. The effects were probably more acute due to the previously dry streambed conditions and the associated floodplain being inundated within a short time from runoff.

Interestingly, with the exception of nitrogen, water quality parameter results during the January 2022 event appeared normal. The elevated nitrogen levels may have resulted from organic detritus (e.g., leaf particles) inadvertently entering the sampling bottle.

The NNC for both total phosphorus and nitrogen were met in 2024, and nutrient levels remained low in 2025, though water levels were too low to get the required amount of samples to calculate the NNC.

Table 1. NNC thresholds and sample results for Lexington Creek. Results in bold signify exceedances of the NNC.

Lexington Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2007	-	-
2008	0.43	0.15
2009	0.13	0.14
2010	0.42	0.15
2011-2013	-	-
2014	0.33	0.12
2015-2017	-	-
2018	0.33	**0.21**
2019	0.40	**0.20**
2020	-	-
2021	0.35	**0.23**
2022-2023	-	-
2024	0.42	0.17
2025	-	-

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples during a 30-day period have been exceeded several times during the sampling period (**Figure 4**). Leon County and FDEP have been in cooperation in the investigation of the source(s) of the bacteria. The results of the Microbial Source Tracking (MST) analyses and other analyses that track probable wastewater

indicators (e.g., sucralose, acetaminophen) suggest that the sources of *E. coli* are human in origin. As part of their normal inspection, the City of Tallahassee (COT) undertook the rehabilitation of the sewer lines in the immediate area of the creek. Unfortunately, at least one leak has occurred since the rehabilitation. A sewer line leak, located within ten meters of the creek, was discovered by Leon County staff on October 23, 2023. The leak was addressed later that same day by COT staff. To better track sources of *E. coli*, Leon County added three additional temporary water quality stations for 2023 (**Figure 5**). Few conclusions were made, but *E. coli* levels exceeded water quality standards at three of the four stations during the November 2023 sampling event. The high levels were probably associated with the approximately 2.8 inches of rain that fell two days prior to the sampling event. Since there are both septic tanks and sewer lines in the basin and bacterial levels are not consistently elevated, staff believe that there could be both malfunctioning septic tanks as well as sewer line leakages contributing to elevated *E. coli* levels in the watershed. These levels may be associated with rain events. However, no *E. coli* exceedances were noted in 2024 or 2025.

Metals

The water quality standard for iron was exceeded during the 1st and 2nd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. As iron is a parameter recently added to the sampling program, few samples have been collected and conclusions on the information collected are tentative. It appears that iron levels, at least in part, appear to be naturally occurring. Staff will continue to evaluate iron levels as additional data becomes available.

Click here for more information on metal levels in Leon County waterbodies.

Turbidity

Turbidity levels have occasionally exceeded water quality standards (**Figure 6**). Sedimentation continues to be an ongoing problem in the stream.

Conclusions

When the appropriate number of samples were collected, the NNC was being met, until 2018 when the total phosphorus NNC was exceeded in 2018, 2019 and 2021. The NNC thresholds for both phosphorus and nitrogen were met in 2024. The *E. coli* water quality limit has been exceeded several times during the sampling period but did not exceed the limit in 2024 or 2025. The iron water quality standard was exceeded during the first two quarters of 2025. It appears that iron levels, at least in part, appear to be naturally occurring. Sedimentation continues to be an ongoing problem in the stream.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 26.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

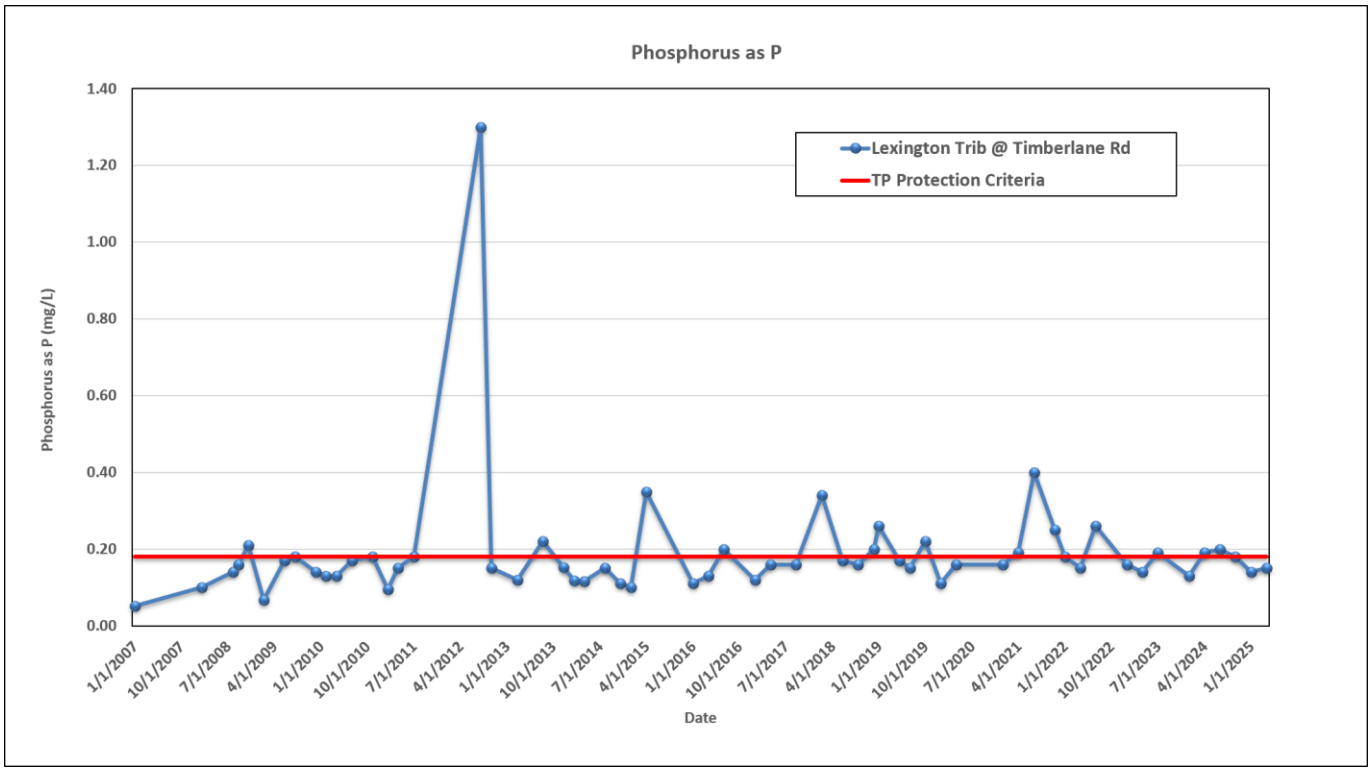


Figure 2. Total Phosphorus values in Lexington Creek.

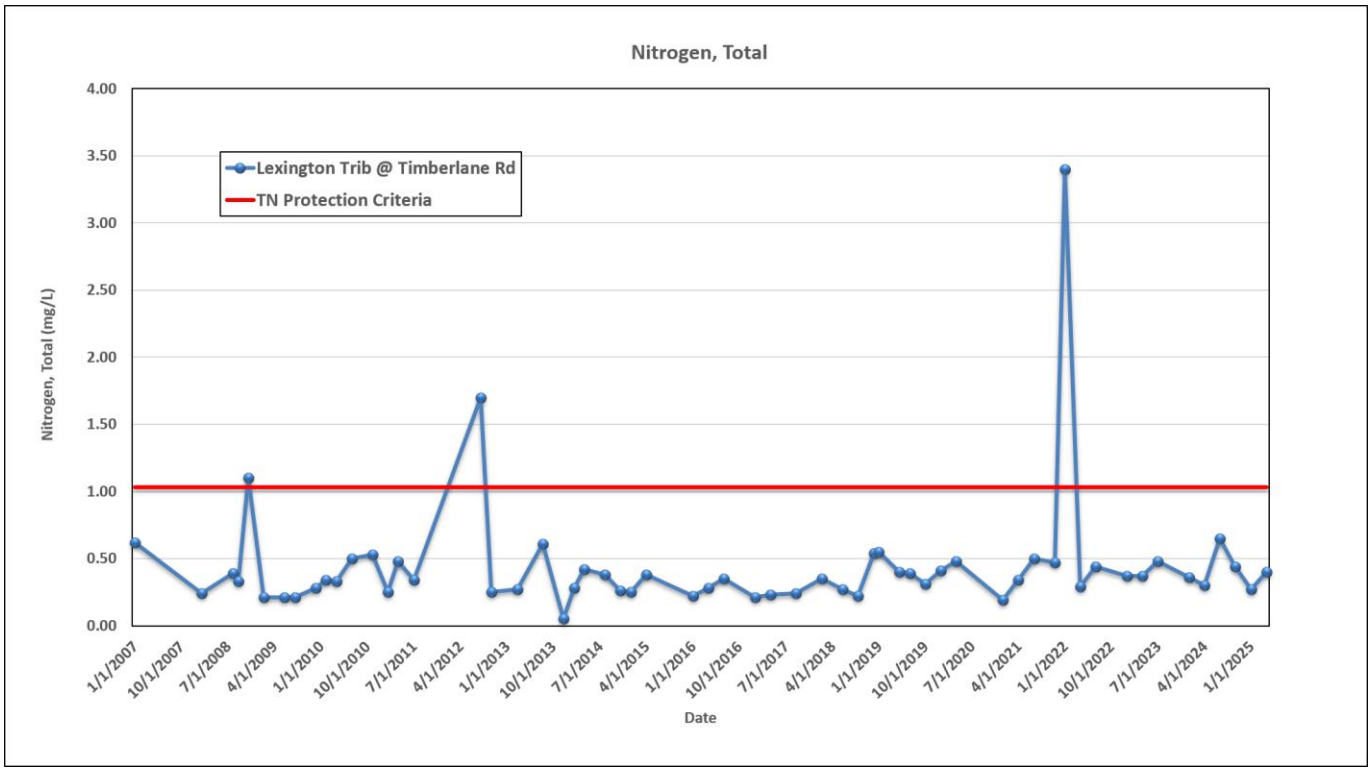


Figure 3. Total Nitrogen values in Lexington Creek.

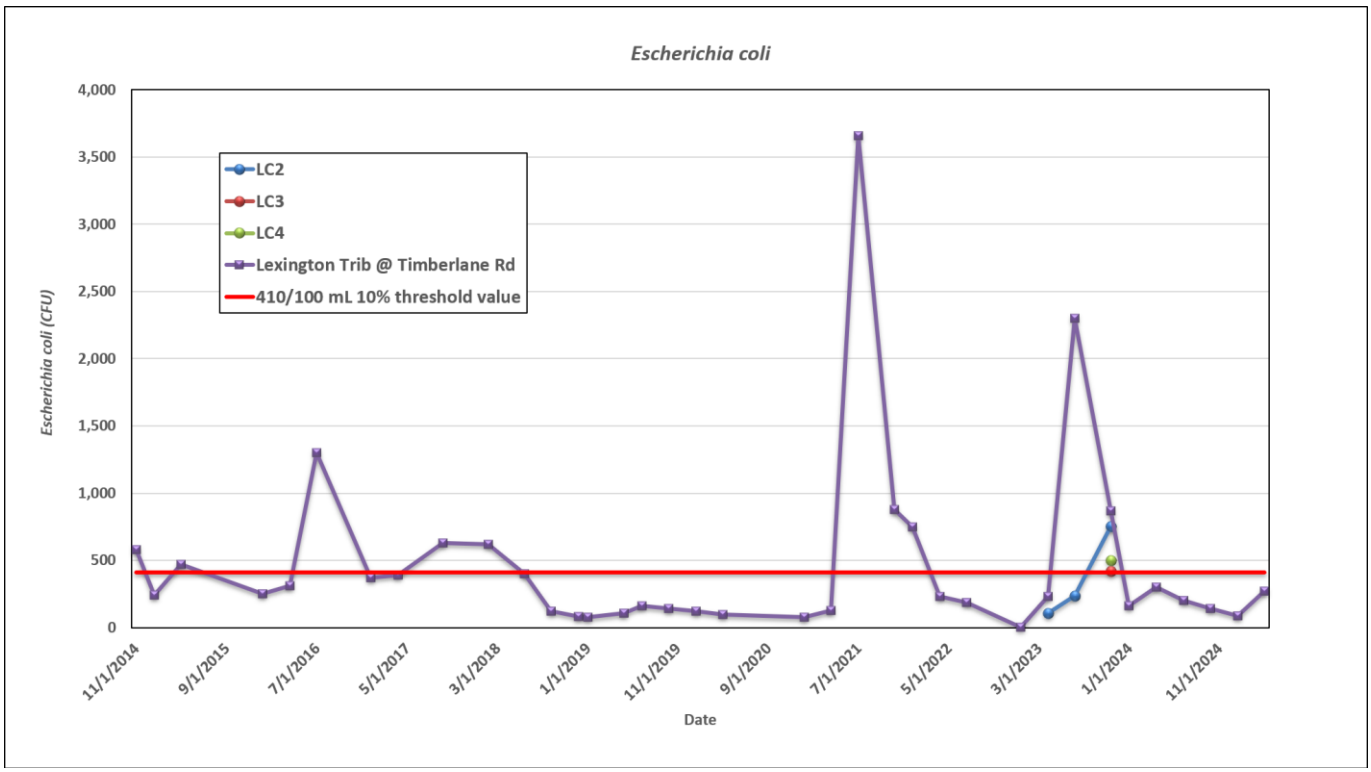


Figure 4. *Escherichia coli* values in Lexington Creek.



Figure 5. Locations of Water Quality Station 26 and the *E. coli* stations LC2, LC3, and LC4.

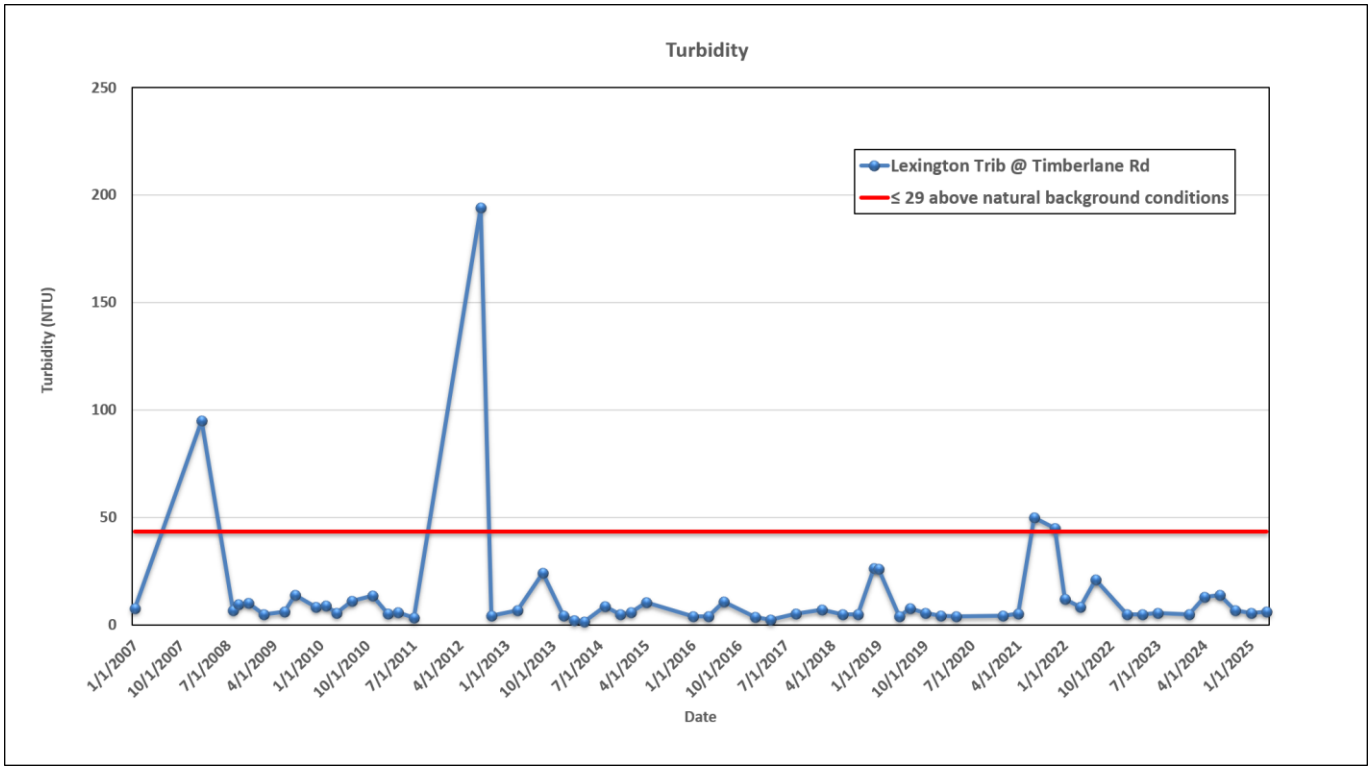
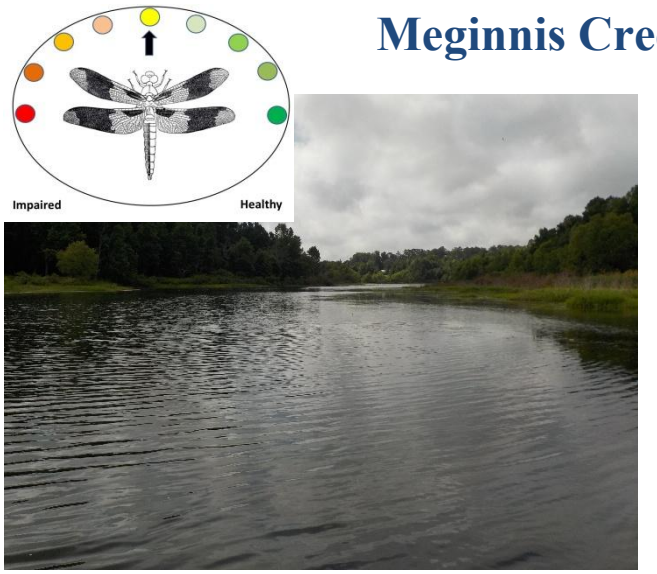


Figure 5. Turbidity values in Lexington Creek.

Meginnis Creek EcoSummary



Meginnis Creek is a substantially altered, nitrogen-limited stream located in the northern part of Tallahassee and drains into Lake Jackson.

As shown in **Figure 1**, residential, commercial and transportation uses make up approximately 85% of the 2,416-acre watershed. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

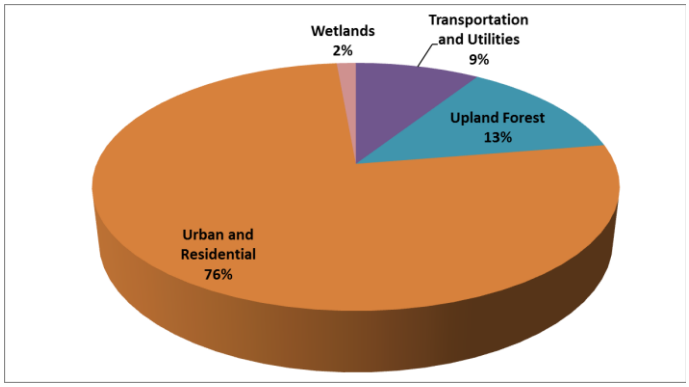


Figure 1. Meginnis Arm watershed land use.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year could not always be collected. Low water levels associated with the Lake Jackson drawdown have prevented sample collection from April 2020 through the end of 2024. One sample was collected in 2025, before low water levels prevented further sampling for the year. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

Nutrients

The nutrient thresholds and results are found in **Table 1**. When sampling requirements were met, the NNC were never exceeded during the period of record.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for Total Phosphorus and never exceeded the criteria for Total Nitrogen.

Table 1. NNC thresholds and sample results for Meginnis Creek.

Meginnis Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2010- 2014*	-	-
2015	0.38	0.05
2016	0.26	0.05
2017	0.35	0.05
2018	-	-
2019	0.30	0.04
2020-2025*	-	-

* Due to a station relocation (2010) and low water conditions, staff could not determine the NNC.

Other Parameters

Dissolved oxygen often did not meet Class III water quality standards (**Figure 4**). This is not surprising since this system is a low velocity system. Lower velocity systems generally have lower levels of dissolved oxygen than high velocity systems because they are less aerated.

Other water quality parameters were typical of the stream, and no exceedances were noted.

Vegetation

Several species of exotic plants are associated with the Meginnis Creek stream corridor including Taro (*Colocasia* sp.), alligator weed (*Alternanthera philoxeroides)*, Chinese tallow (*Sapium sebiferum*), rattlebox (*Sesbania punicea*) and hydrilla (*Hydrilla verticillata*). In many cases exotic plants will crowd out native plants which in turn stress native wildlife which has evolved to depend on native plants for food and shelter. The native wildlife may move away or perish if the native vegetation is replaced by exotic plants. The Florida Fish and Wildlife Conservation Commission have an aquatic plant management program that manages the creek and the greater Lake Jackson area. The program is effective to the degree that the exotic vegetation does not overwhelm the native vegetation, but staff recommends that the problem of exotic plants be more aggressively pursued in this area of the watershed.

Conclusions

Based on ongoing sampling, Meginnis Creek met the NNC for the East Panhandle Region. Dissolved oxygen rarely meets Class III water quality standards. Several species of exotic plants are associated with the Meginnis Creek corridor. The Florida Fish and Wildlife Conservation Commission have an aquatic plant management program and continues to manage the creek and the greater Lake Jackson area.

Thank you for your interest in maintaining the water quality of Leon County's aquatic resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site JL01.

Richardsonjo@leoncountyfl.gov

Johnny Richardson, Water Resource Scientist
(850) 606-1500

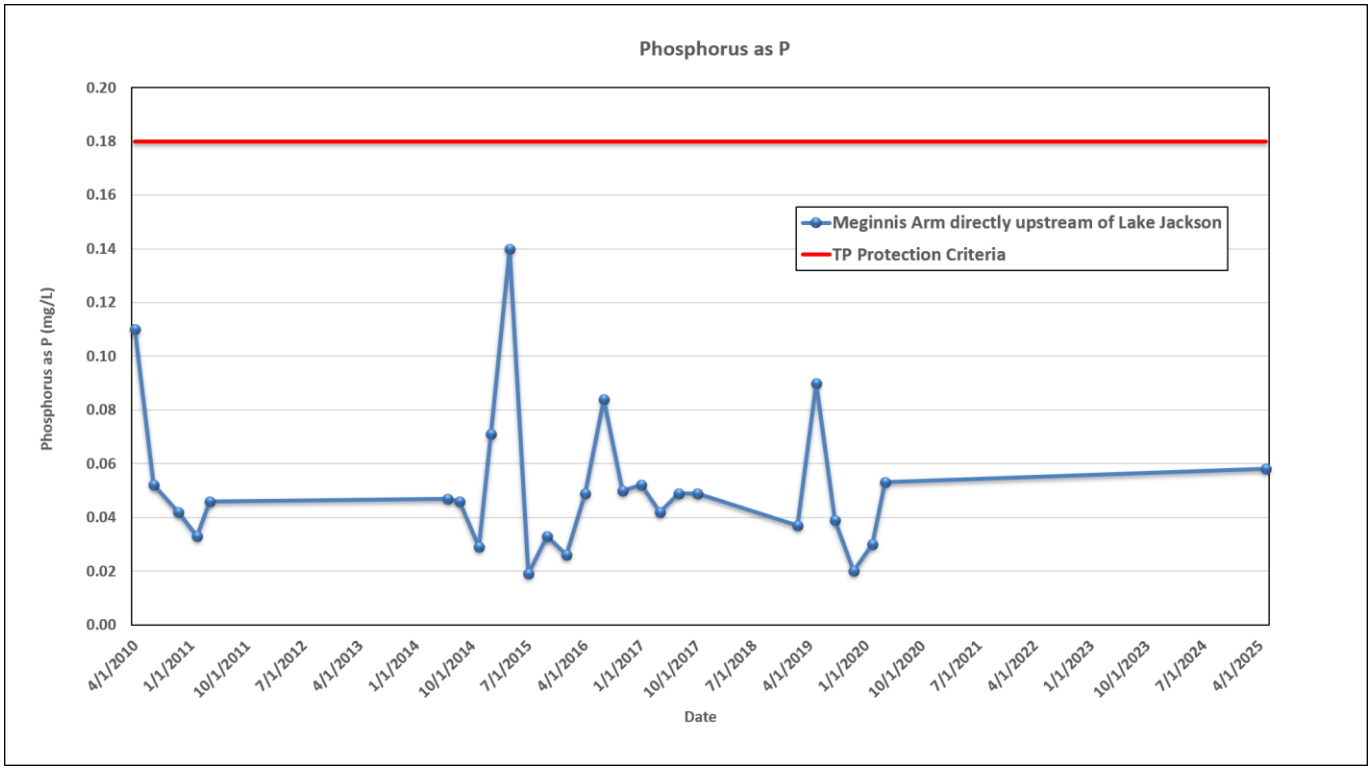


Figure 2. Total Phosphorus results for Meginnis Creek.

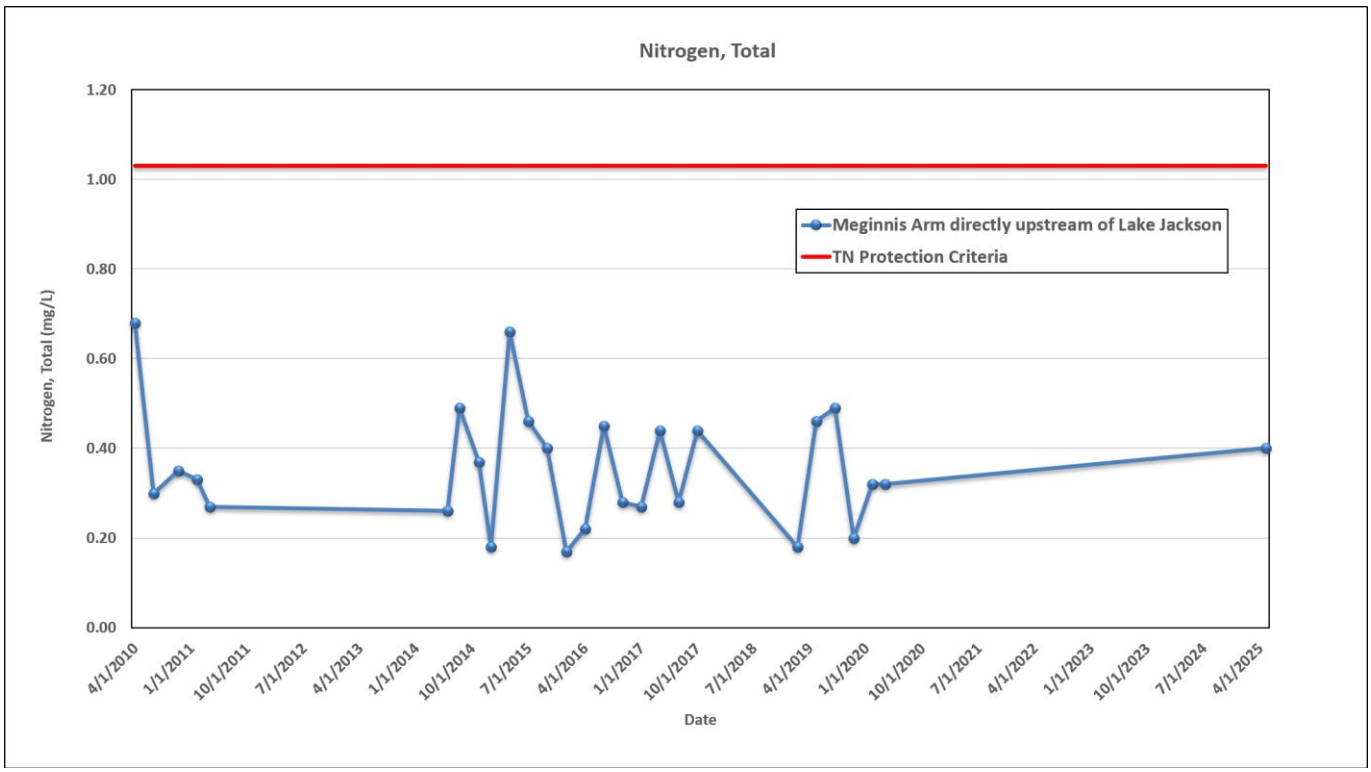


Figure 3. Total Nitrogen results for Meginnis Creek.

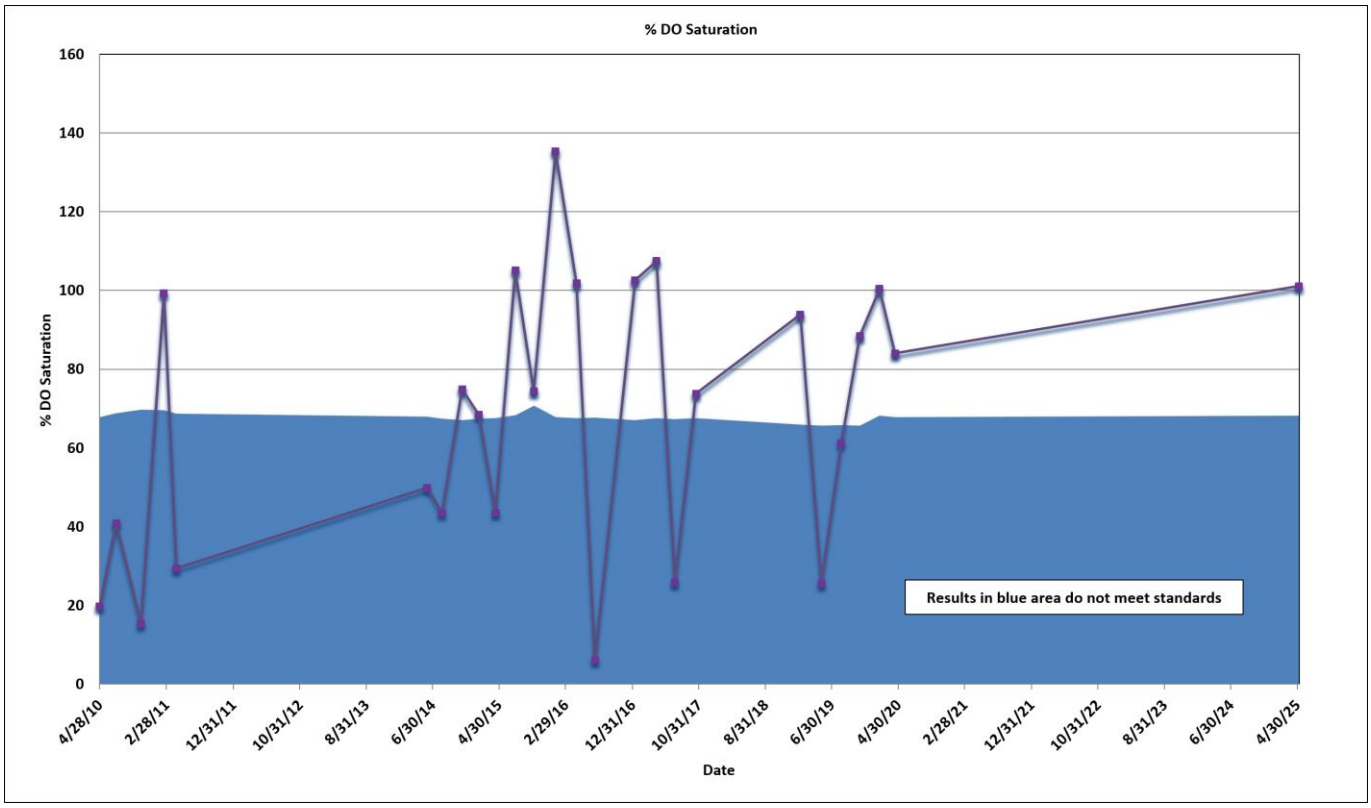
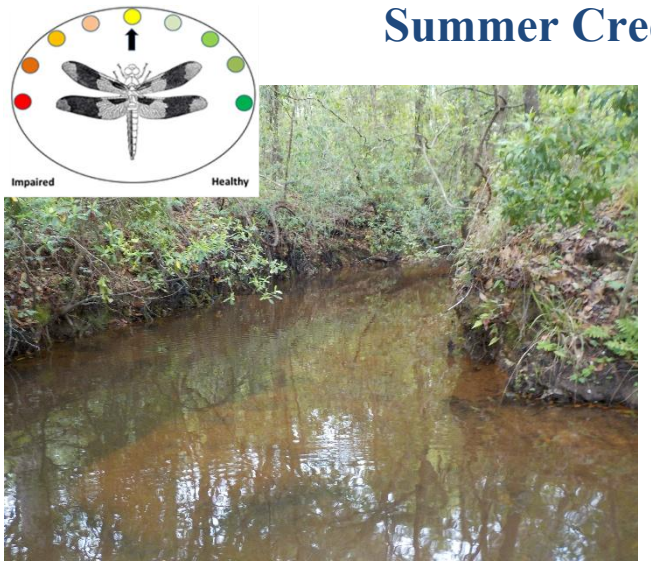


Figure 4. Dissolved Oxygen Percent Saturation results for Meginnis Creek.

Summer Creek EcoSummary



Summer Creek is a slightly tannic stream located in northwestern Leon County and discharges to Lake Carr.

Approximately 69% of land use in the 103-acre watershed is urban, residential, transportation and utilities (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

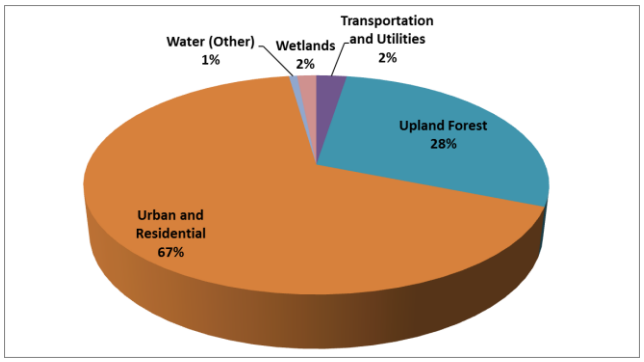


Figure 1. Summer Creek watershed land use.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples were collected quarterly. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

According to FDEP requirements, Numeric Nutrient Criteria (NNC) (expressed as an annual geometric mean) cannot be exceeded more than once in a three-year period. Due to low water conditions at Station 22, FDEP data requirements for the NNC could not be met in 2007 and 2010 through 2017 (**Table 1**). Because of persistent low water/dry conditions, staff eliminated this sampling station in the 3rd quarter of 2017 and established Station SB2 further downstream. The 2018-2024 FDEP data requirements for the NNC were met and results demonstrated that NNC thresholds were not exceeded for Station SB2. Low water levels prevented water quality sampling during the 4th quarter of 2025. Based on the three samples collected, nutrient levels were comparable to previous years.

Dissolved Oxygen (DO)

As **Figure 2** shows, Summer Creek did not always meet the Class III criteria for DO. Staff believe the low DO in Summer Creek is due to

upstream wetlands and the naturally low gradient, low flow condition of the creek.

Table 1. NNC thresholds and sample results for Summer Creek.

Summer Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2007*	-	-
2008	0.37	0.02
2009	0.20	0.03
2010- 2017*	-	-
2018	0.36	0.07
2019	0.38	0.07
2020	0.26	0.08
2021	0.22	0.07
2022	0.28	0.06
2023	0.32	0.08
2024	0.38	0.06
2025*	-	-

* Due to low water conditions, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a thirty-day period was exceeded several times over the sampling period (**Figure 3**). Elevated bacteria levels could be the result of beaver activity or other wildlife in the area. No exceedances were noted in 2025.

Metals

Iron exceeded water quality criteria during the first three quarters of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. As iron is a parameter recently added to the sampling program, few samples have been collected and conclusions on the information collected are tentative. It appears that iron levels, at least in part, appear to be naturally occurring. Staff will continue to evaluate iron levels as additional data becomes available.

Click here for more information on metal levels in Leon County waterbodies.

Conclusions

When sampling requirements were met, Summer Creek met the nutrient thresholds for the East Panhandle Region. Dissolved oxygen criteria were seldom met during the sampling period. The stream is a low gradient, low flow system that drains a wetland, so these results are not unexpected. Iron exceeded water quality criteria during the first three quarters of 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites 22 and SB2.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

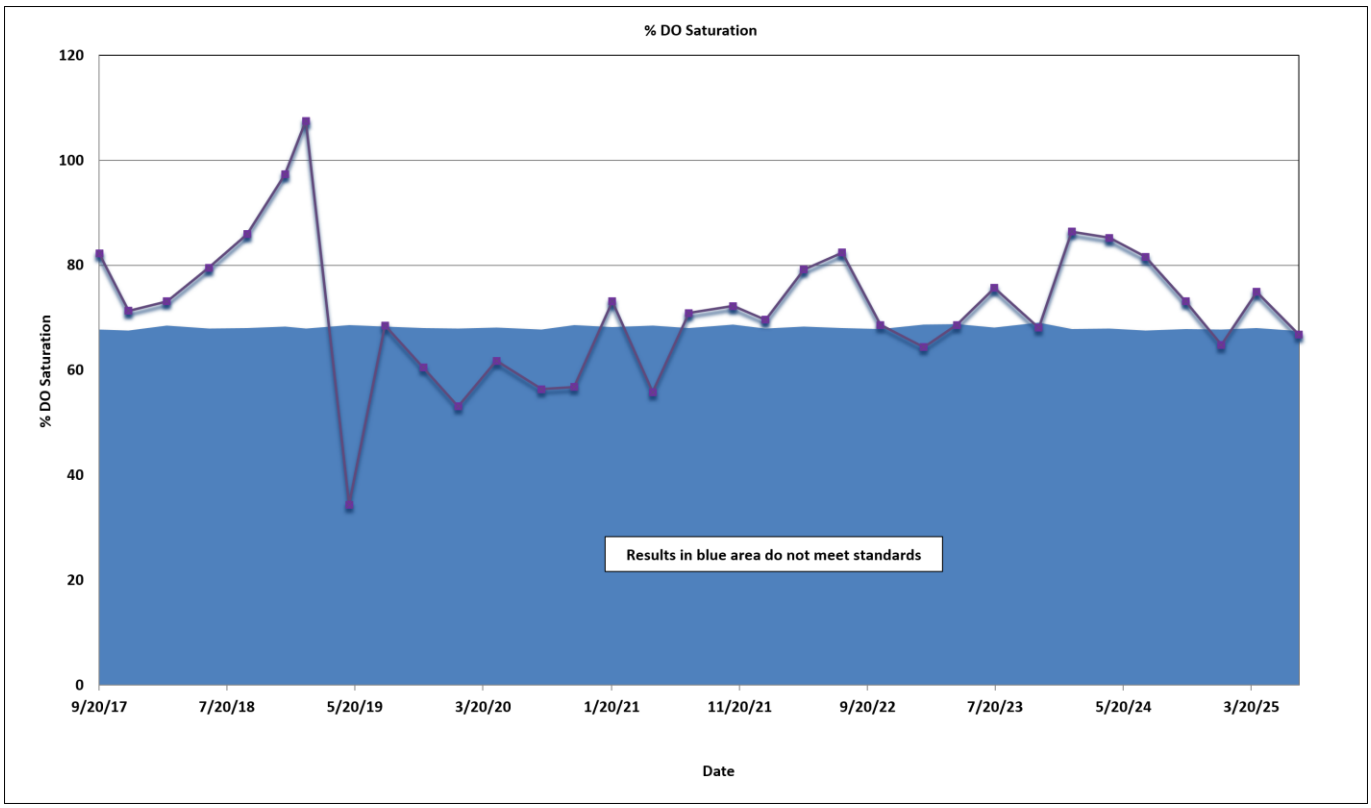


Figure 2. Dissolved Oxygen Percent Saturation results for Summer Creek.

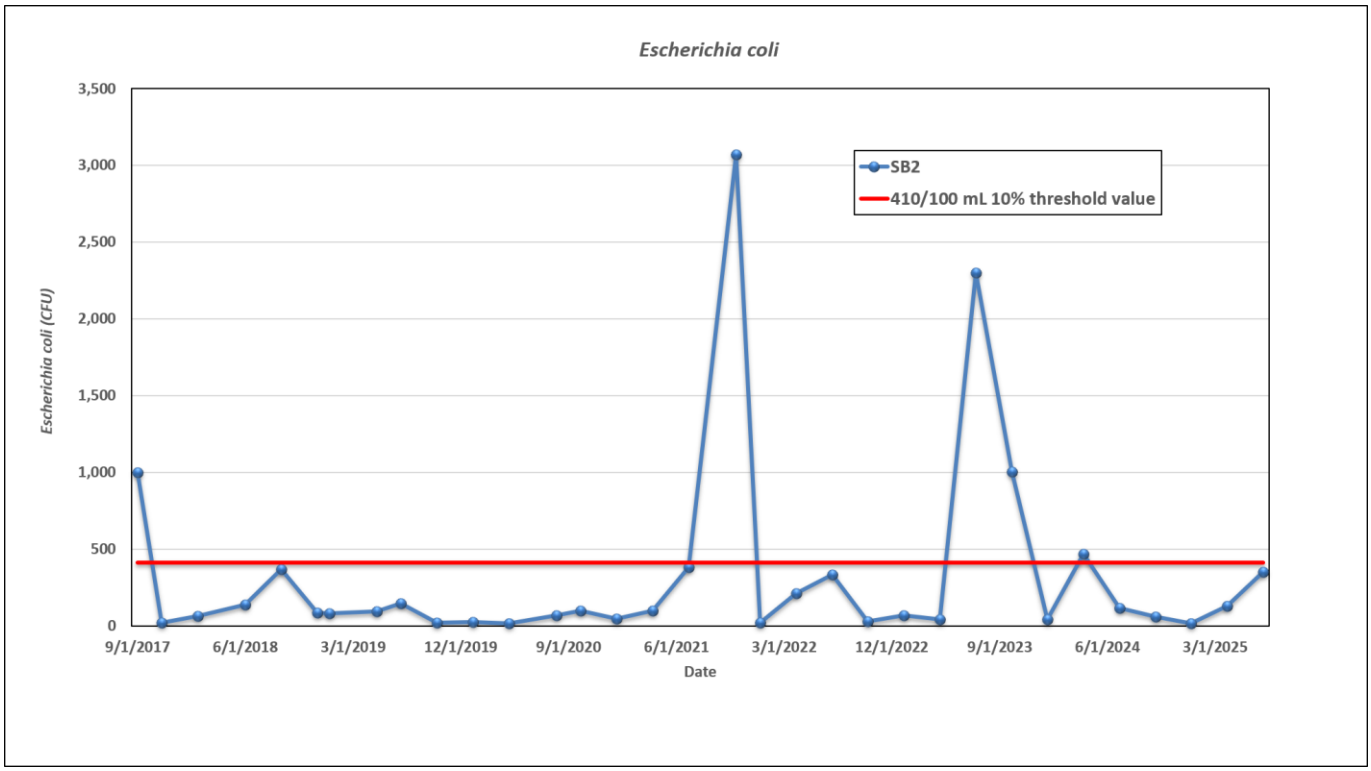
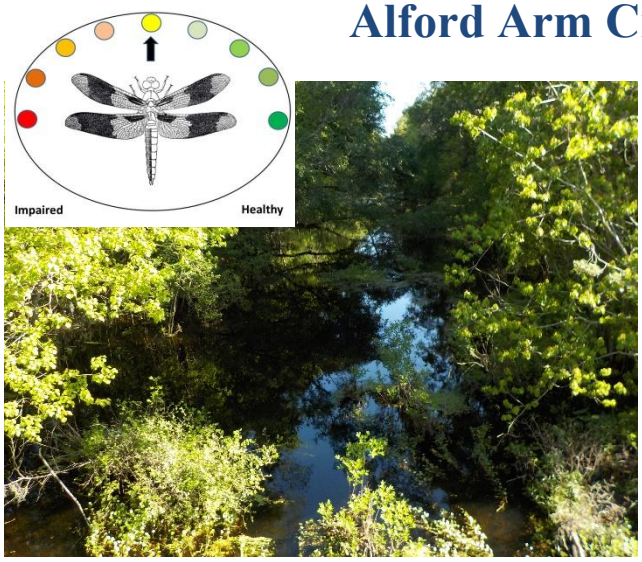


Figure 2. *E. coli* results for Summer Creek.

5. Lake Lafayette Basin

Alford Arm Creek EcoSummary



The Alford Arm tributary is a moderately altered, nitrogen-limited stream located in the northern part of Leon County. The tributary flows from Lake McBride in the Bradfordville area and receives runoff from the heavily developed Killearn Estates and Killearn Acres neighborhoods. Many of the waterbodies within these neighborhoods are former agricultural ponds, most notably the Velda Dairy impoundments that are now seen as residential amenities.

Approximately 55% of land use in the 26,913-acre watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

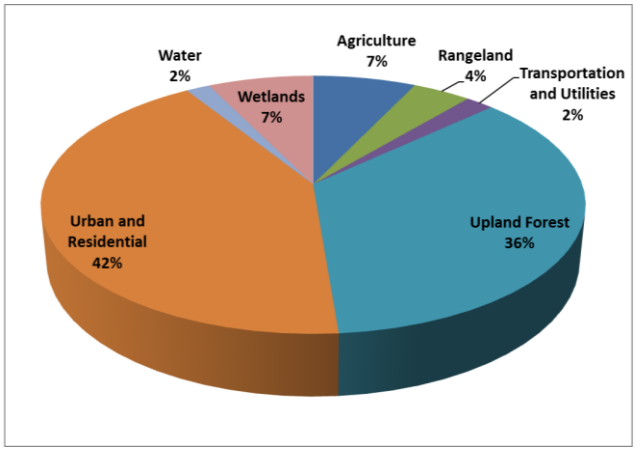


Figure 1. Alford Arm Creek watershed land use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Alford Arm Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP

requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water and back flow conditions, four temporally independent samples per year have never been collected from this station. For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for Total Nitrogen or Total Phosphorus.

Dissolved Oxygen

As **Figure 4** shows, Alford Arm Creek did not always meet the Class III criteria for % dissolved oxygen (DO) saturation. This is not surprising since low gradient, low flow streams often have low DO levels.

Metals

Iron levels exceeded water quality criteria during the 2nd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. As iron is a parameter recently added to the sampling program, few samples have been collected and conclusions on the information collected are tentative. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a thirty-day period was exceeded (580 CFU) during the January 2025 sampling event. Based on anthropogenic land use, the exceedance could possibly be the result of residential development in the watershed (e.g., improperly functioning septic tanks or leaking sewer pipes). Other causes could be wild animals and/or agriculture within the watershed.

Vegetation

Several species of invasive exotic plants are in the water and line the bank of the tributary including tallow tree (*Sapium sebiferum*) and privet (*Ligustrum* sp.). In many cases, exotic plants will crowd out and replace native plants. This may stress native wildlife, which have evolved to depend on native plants for food and shelter. The native wildlife may move away or perish if the native vegetation is replaced by exotic plants.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Alford Arm nutrient levels appear, in most cases, to meet the NNC for the East Panhandle Region. Over the sampling period, the Class III criterion for % DO saturation was not always met. Iron levels exceeded water quality criteria during the 2nd quarter of 2025. It appears that iron levels, at least in part, appear to be naturally occurring. The *E. coli* water quality limit during the January 2025 sampling event exceeded Class III water quality criteria. Several species of invasive exotic plants are in and around the tributary.

Thank you for your interest in maintaining the water quality of Leon County's aquatic resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 1

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

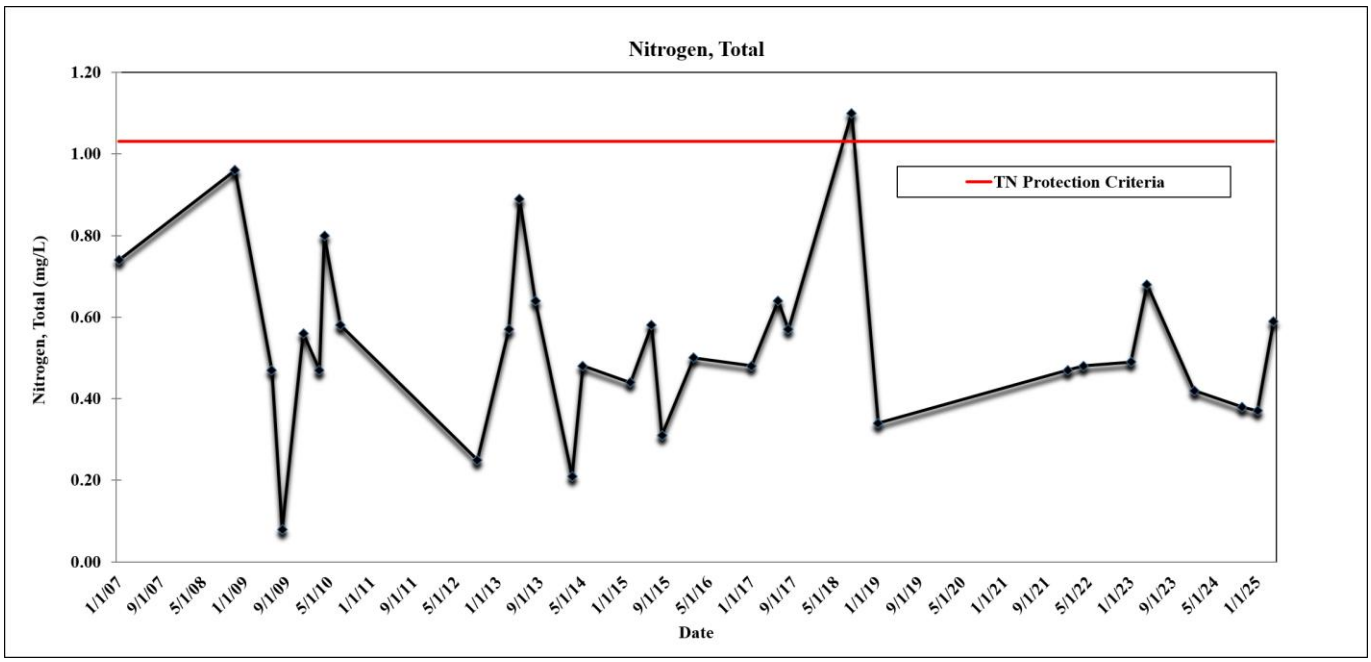


Figure 2. Total Nitrogen results for Alford Arm Creek.

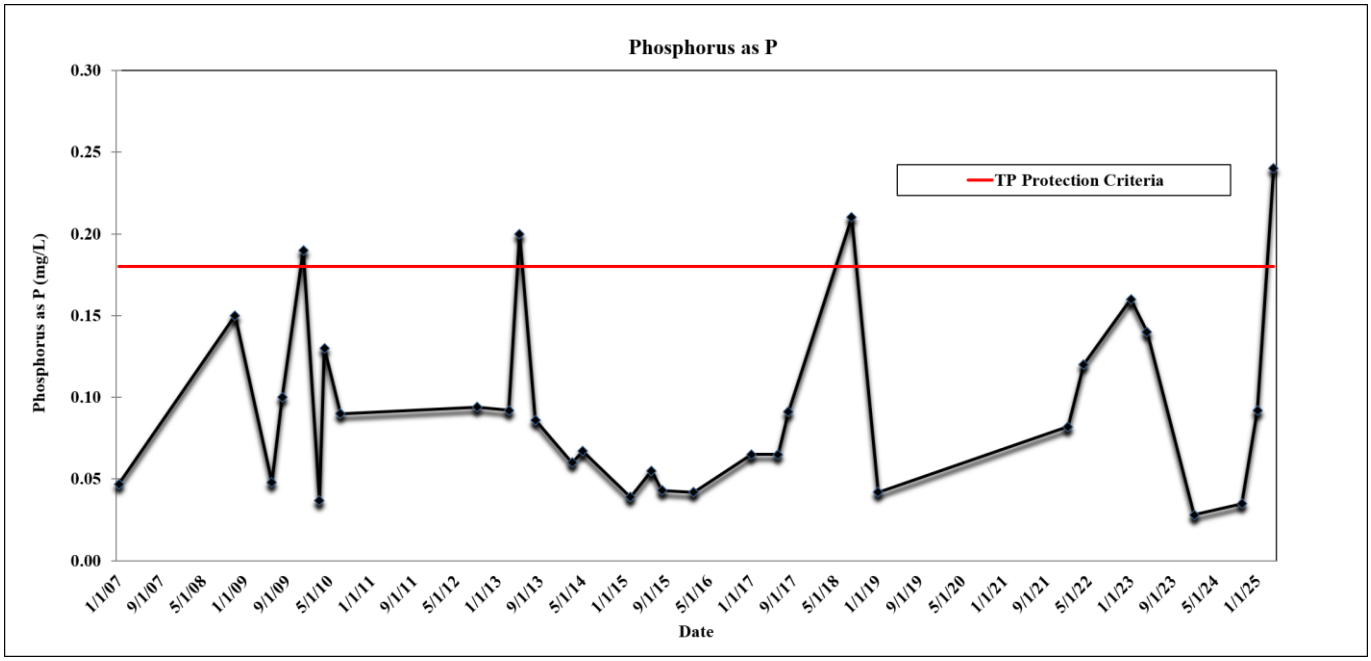


Figure 3. Total Phosphorus results for Alford Arm Creek.

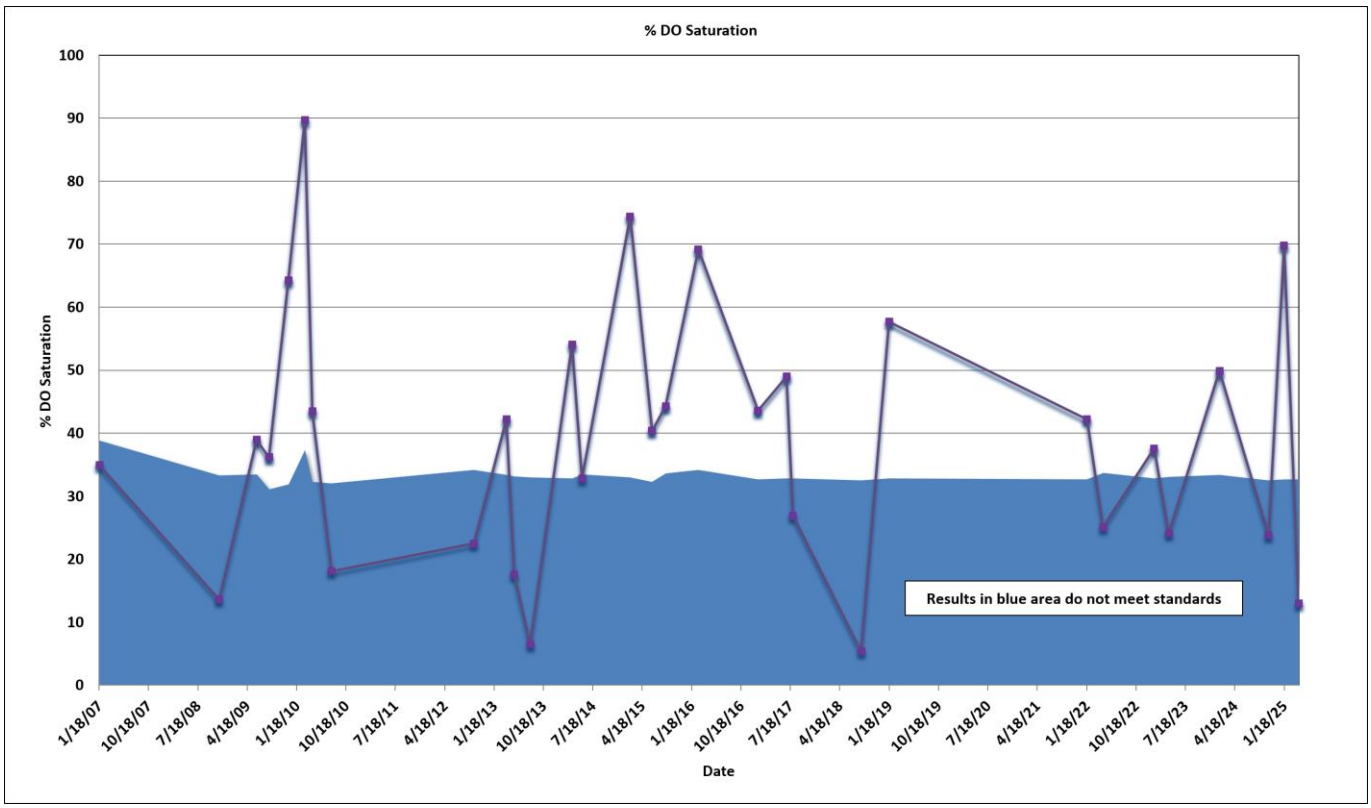
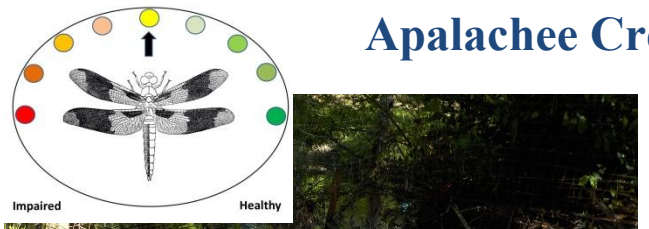


Figure 4. Dissolved Oxygen Percent Saturation results for Alford Arm Creek.

Apalachee Creek EcoSummary



Apalachee Creek is a slightly tannic stream that flows north and drains into Lower Lake Lafayette.

Approximately 52% of land use in the 800-acre watershed is agriculture, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

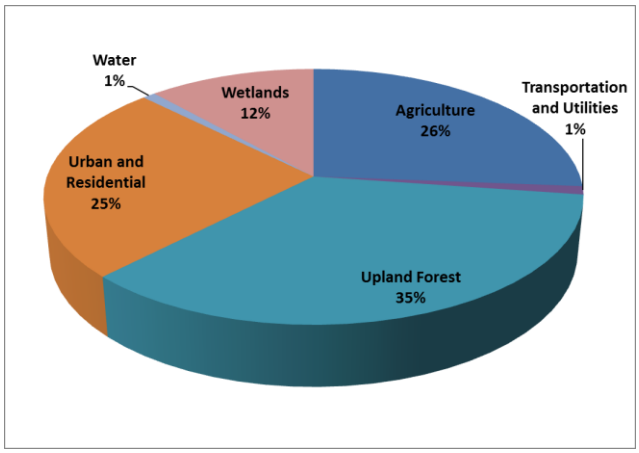


Figure 1. Apalachee Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Apalachee Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year could not always be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

Nutrients

The nutrient thresholds and results are found in **Table 1**. The NNC has never been exceeded during the period of record.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for total phosphorus and never exceeded for total nitrogen. High rainfall prior to the July 2025 sampling event led to nutrient laden runoff entering the stream and also contributed to higher bacterial levels in the water column.

Table 1. NNC Thresholds and Sample Results for Apalachee Creek.

Apalachee Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2007- 2008	-	-
2009	0.32	0.11
2010-2012	-	-
2013	0.41	0.12
2014	0.30	0.10
2015-2020	-	-
2021	0.39	0.10
2022-2025	-	-

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a thirty-day period was exceeded four times since 2021 (**Figure 4**). The latest exceedance occurred during the July 2025 sampling event. High rainfall prior to sampling probably contributed to high bacterial levels due to runoff. Possible sources of *E. coli* include wildlife or improperly functioning septic tanks or leaking sewer pipes.

Vegetation

Several species of exotic plants line the bank of Apalachee Creek including wild taro (*Colocasia* sp.) and privet (*Ligustrum* sp.). In many cases, exotic plants will crowd out and replace native plants. This may stress native wildlife, which have evolved to depend on native plants for food and shelter. The native wildlife may move away or perish if the native vegetation is replaced by exotic plants.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Metals

The Apalachee Creek station exceeded the water quality limit for iron during the 2nd (2.41 mg/L) and 3rd (2.16 mg/L) quarters of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil types can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area, and no impairments were noted.

Conclusions

Based on ongoing sampling, Apalachee Creek met the NNC for the East Panhandle Region. The *E. coli* water quality limit was exceeded four times since 2021. The exceedances could be the result of wildlife or improperly functioning

septic tanks or leaking sewer pipes. Several species of exotic plants line the bank of Apalachee Creek which may affect native wildlife dependent on native plants for food and shelter. The water quality criterion for iron was exceeded during the 2nd and 3rd quarters of 2025. It appears that iron levels, at least in part, appear to be naturally occurring. Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Thank you for your interest in maintaining the water quality of Leon County's aquatic resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 63

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

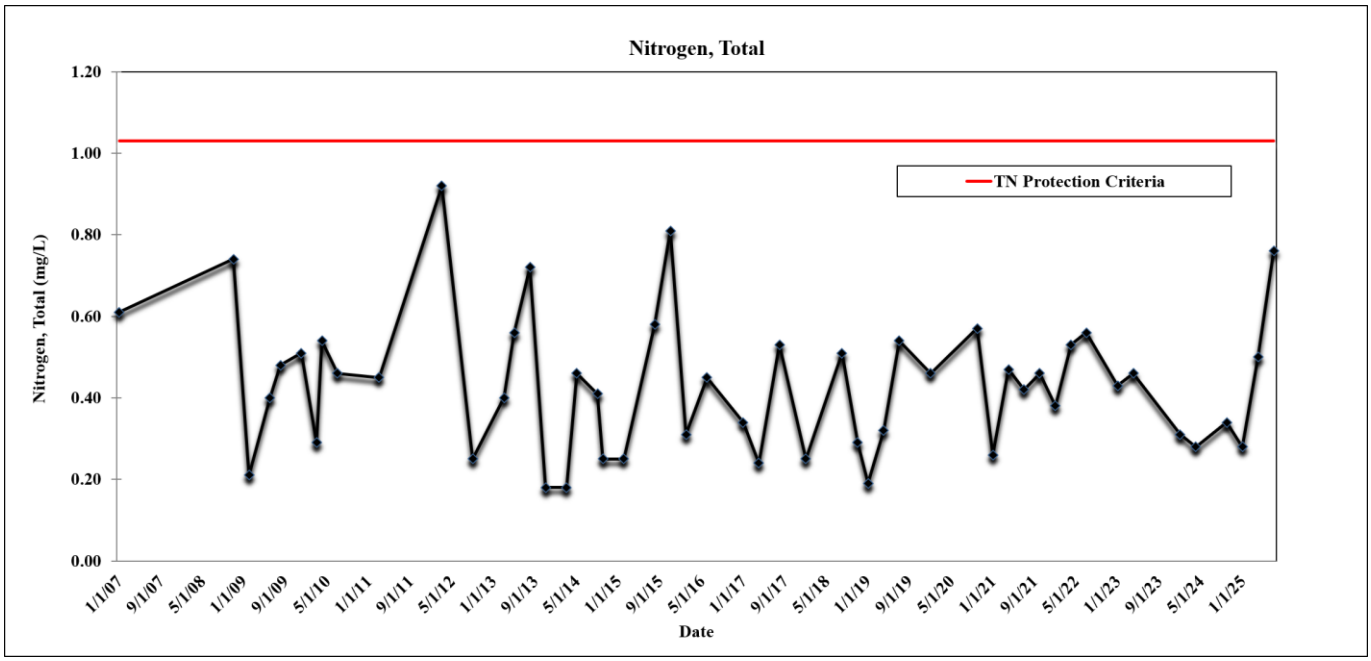


Figure 2. Total Nitrogen results for Apalachee Creek.

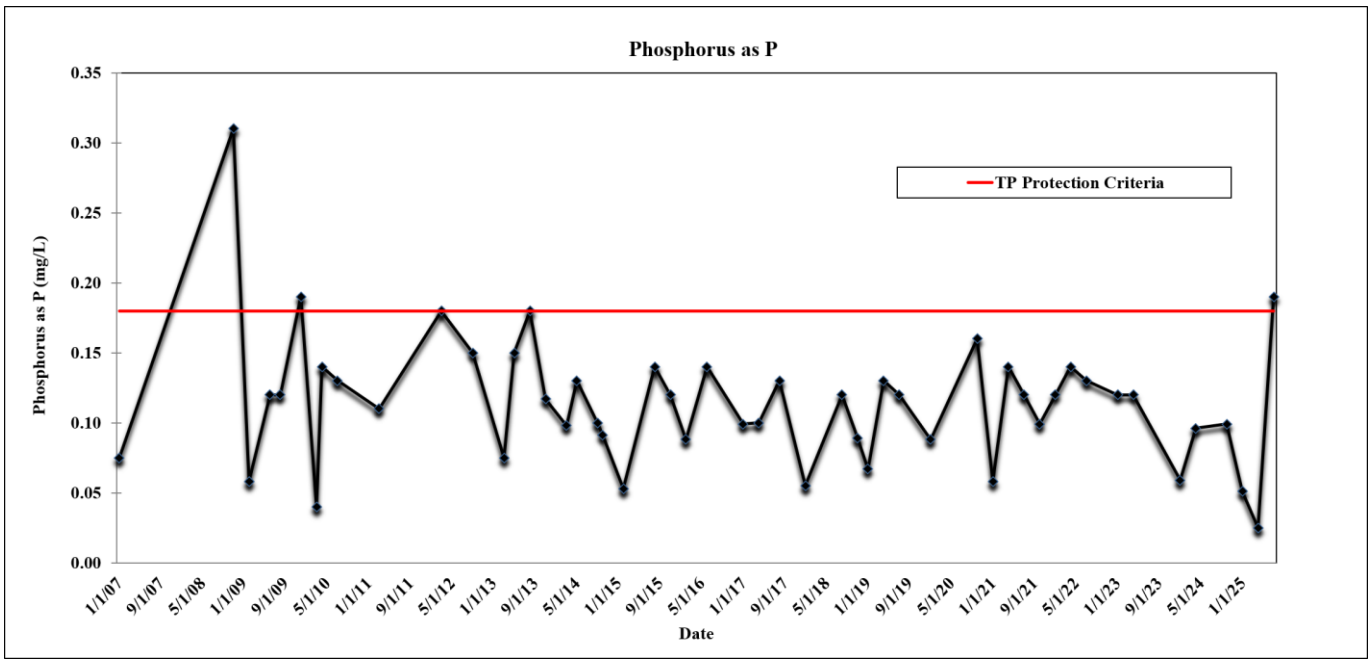


Figure 3. Total Phosphorus results for Apalachee Creek.

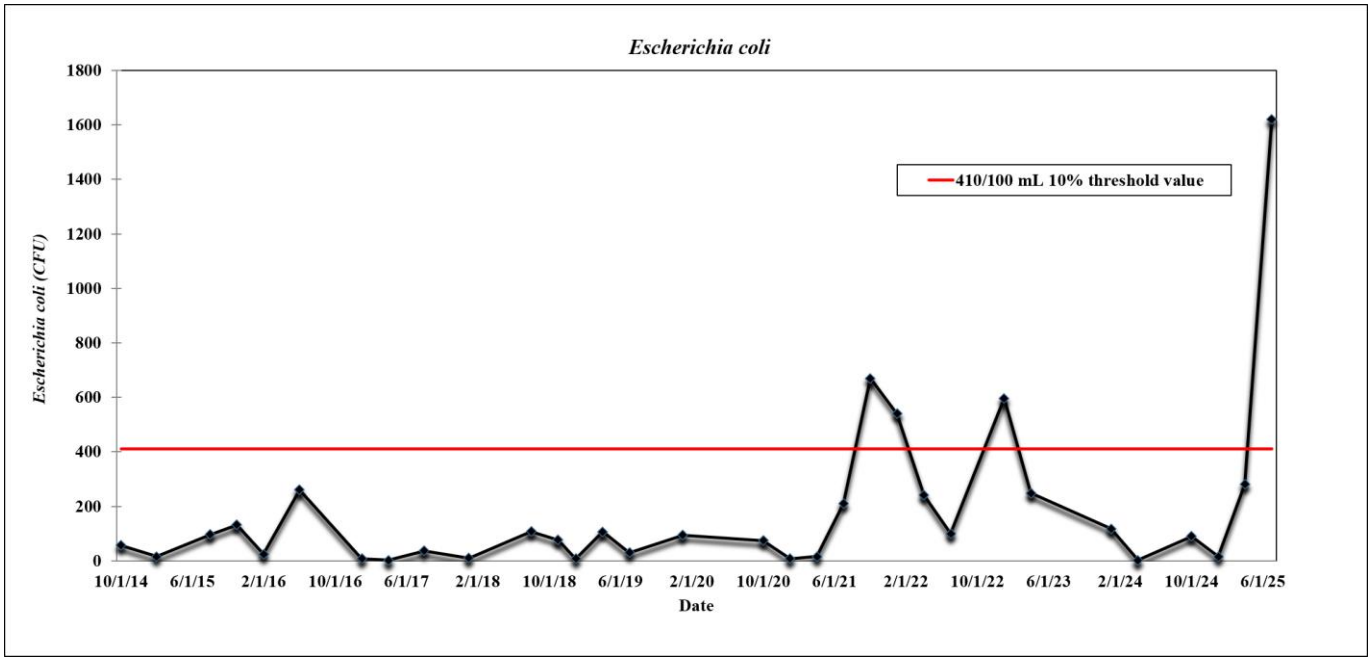


Figure 3. *E. coli* results for Apalachee Creek.

Lafayette Creek EcoSummary



Lafayette Creek is a slightly tannic stream that flows north and drains into Upper Lake Lafayette. Station 1 is located on Apalachee Parkway, while Station 2 is located further downstream where Lafayette Creek enters Upper Lake Lafayette. Due to a lack of access to Station 1, Station 3 was established, in a more accessible location and replaced Station 1 during the 4th quarter of 2023.

Approximately 60% of land use acreage in the 1,860-acre watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

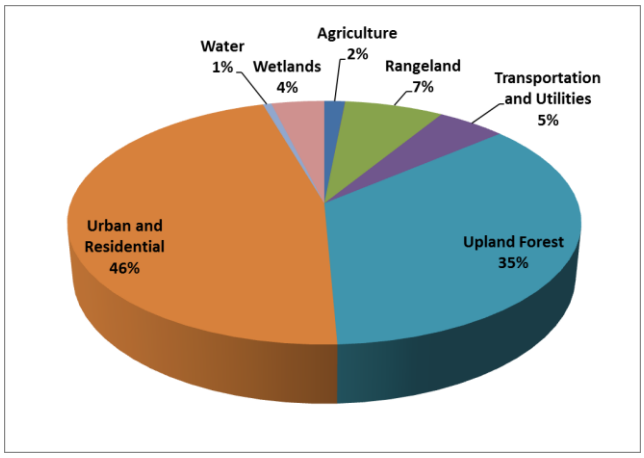


Figure 1. Lafayette Creek watershed land use.

Background

Healthy, well-balanced stream communities may

be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Lafayette Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, FDEP data requirements for the NNC could not be met for 2010 through 2012, 2022, and 2023 for Station 1 (**Table 1**) and in 2025 for Station 3 (**Table 2**). Requirements were met only once (2021) at Station 2 since 2007.

Table 1. NNC Thresholds and Sample Results for Lafayette Creek (Station 1). Due to the current lack of access, Station 1 is no longer sampled.

Lafayette Creek Station 1	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2008	0.77	0.16
2009	0.59	0.18
2010-2012	-	-
2013	0.76	0.10
2014	0.47	0.07
2015	0.80	0.13
2016	0.85	0.11
2017	0.52	0.08
2018	0.53	0.10
2019	0.49	0.13
2020	0.78	0.12
2021	0.48	0.10
2022-2023	-	-

Table 2. NNC Thresholds and Sample Results for Lafayette Creek (Station 3).

Lafayette Creek Station 3	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2024	0.34	0.13
2025	-	-

For illustrative purposes, individual data points were plotted for Stations 2 and 3 to determine any possible trends (**Figures 2 and 5**). With only two exceptions (for phosphorus), individual values did not exceed the instream criteria for total nitrogen or total phosphorus.

Escherichia coli (E. coli)

E. coli levels at Station 2 exceeded the Class III water quality standard daily limit of > 410 in 10% threshold value of samples collected over a 30-day period during the 3rd (580 CFU) quarter of 2025. Exceedances are possibly the result of residential development in the watershed and/or domestic or wild animals.

Metals

Both Stations 1 and 3 exceeded the water quality standard for iron in 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Exotic Plants

Several species of exotic plants line the bank of Lafayette Creek including wild taro (*Colocasia esculenta*), coral ardesia (*Ardesia crenata*) and privet (*Ligustrum* spp.). In many cases, exotic plants will crowd out and replace native plants. This may stress native wildlife, which have evolved to depend on native plants for food and shelter. The native wildlife may move away or perish if the native vegetation is replaced by exotic plants.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Elevated turbidity values were identified in sampling and remain an issue for Lafayette Creek that could negatively affect native creek

fauna. Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

While individual nutrient results occasionally spiked above threshold criteria, Lafayette Creek continued to meet the NNC thresholds for the East Panhandle Region. Elevated turbidity values were identified in sampling and remain an issue for Lafayette Creek that could negatively affect native creek fauna. *E. coli* levels at Station 2 exceeded the Class III water quality standard during the 3rd quarter of 2025. Exceedances are possibly the result of residential development in the watershed and/or domestic or wild animals. Both Stations 1 and 3 exceeded the water quality standard for iron in 2025. It appears that iron levels, at least in part, appear to be naturally occurring. Several species of exotic plants line the bank of Lafayette Creek which may affect native wildlife dependent on native plants for food and shelter. Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of watershed – Sample Sites 65 (Station 1), LafayetteCreek3 (Station 2), and 67 (Station 3).

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

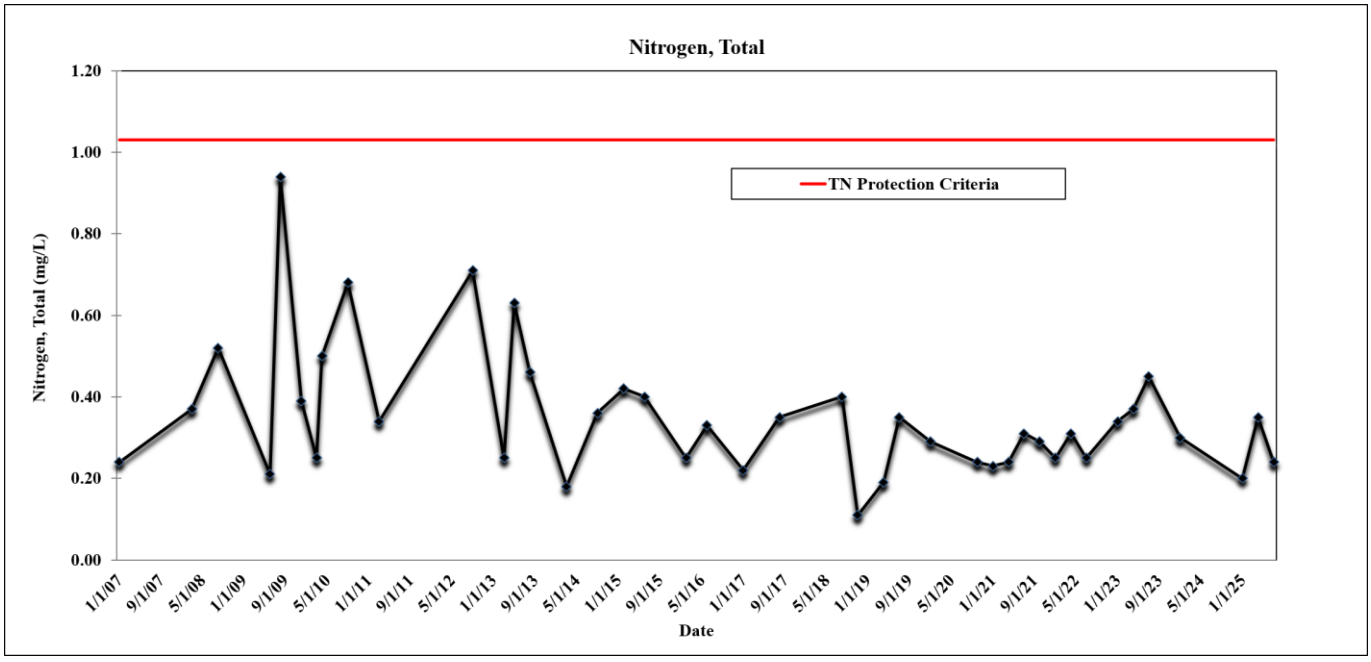


Figure 2. Total Nitrogen results for Station 2 on Lafayette Creek.

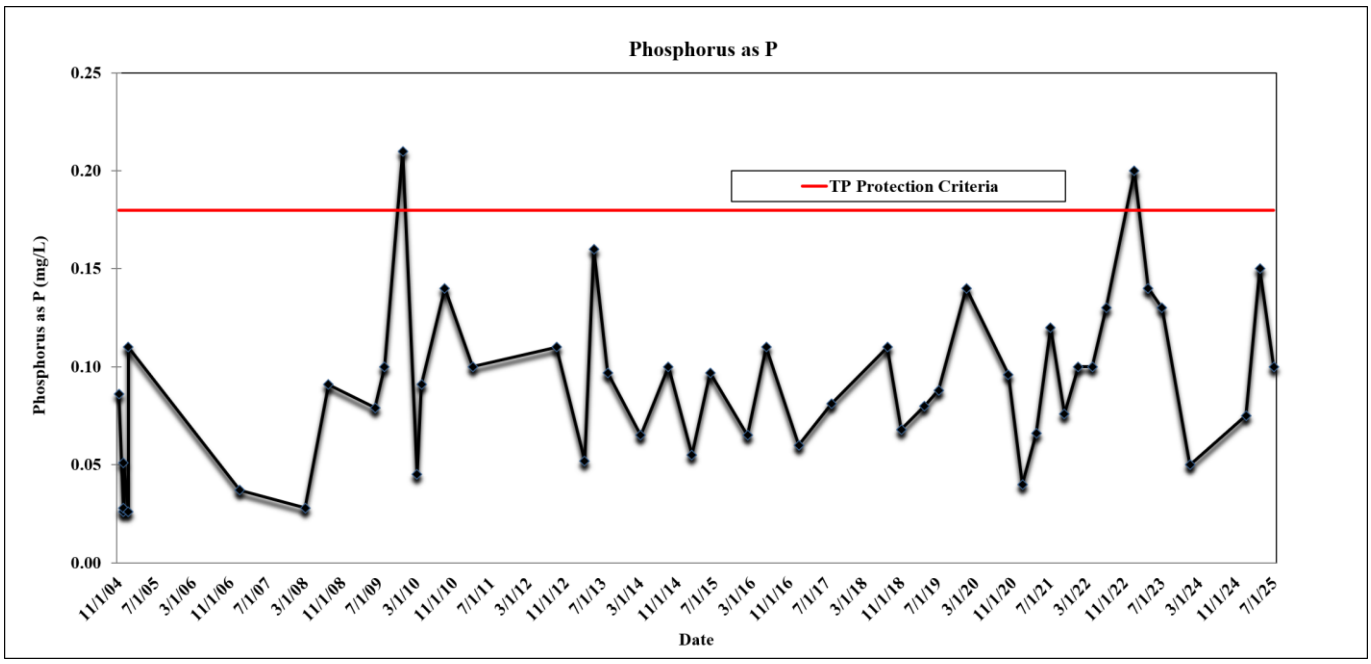


Figure 3. Total Phosphorus results for Station 2 on Lafayette Creek.

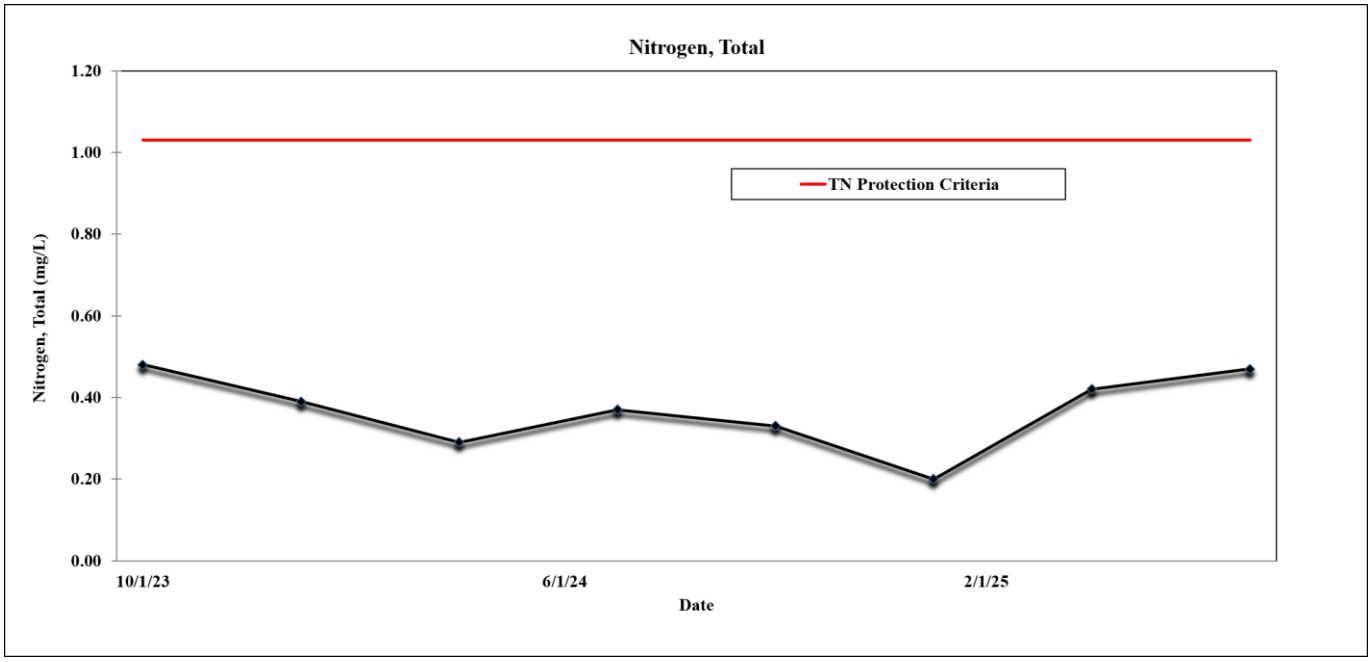


Figure 4. Total Nitrogen results for Station 3 on Lafayette Creek.

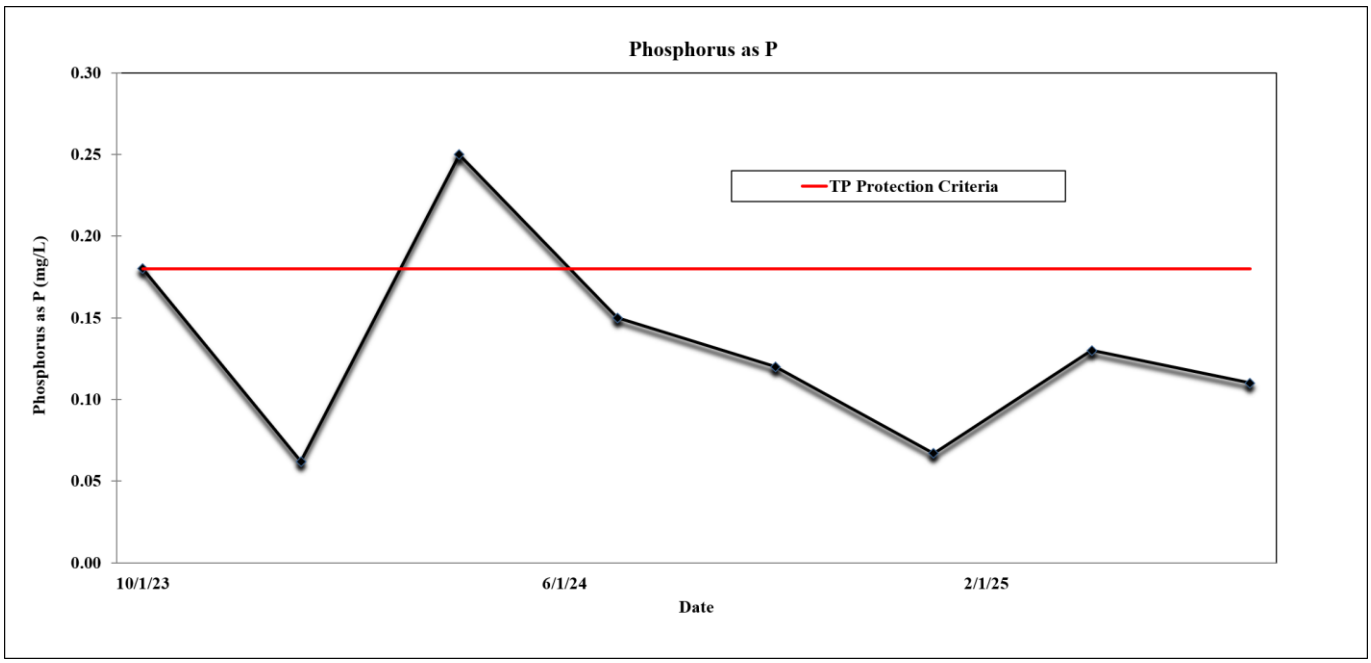


Figure 5. Total Phosphorus results for Station 3 on Lafayette Creek.

Lake Lafayette EcoSummary



Lake Lafayette was historically a meandering, wetland/prairie lake system located in eastern Leon County, but land alterations in the mid-1900s separated the lake into four distinct sections, known as Upper Lake Lafayette (ULL), Lake Piney Z, Alford Arm, and Lower Lake Lafayette (LLL). Limited hydraulic connectivity occurs between the various sections, much of which is present only during high water elevations. Because of the compartmentalization of the four sections, each section is treated as a separate "lake" with its own watershed.

Wetland or Lake?

Lower Lake Lafayette appears and functions like a cypress dominated swamp, while Alford Arm is a combination of cypress and various emergent/floating plant species. Typical of wetlands, there is little open water at either location, and the open water that currently exists in Lower Lake Lafayette is due to Fish and Wildlife's maintenance of the canoe trails. Due to access issues (low water and the extreme amounts of vegetation) Leon County staff have been unable to sample Alford Arm for several years and have only intermittently sampled Lower Lake Lafayette.

Background

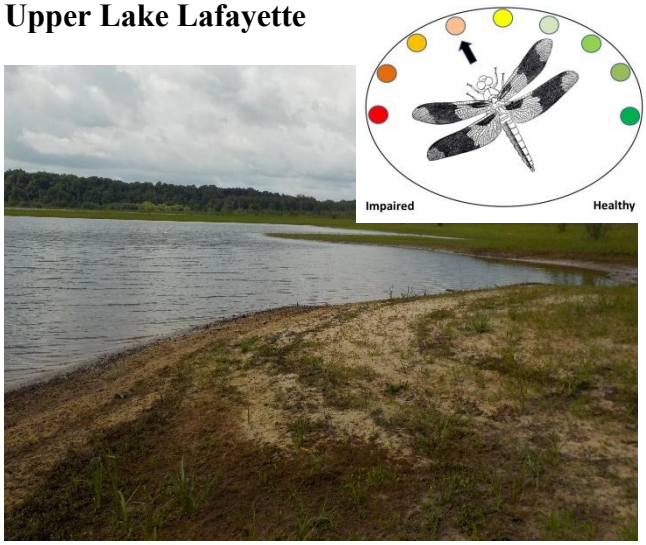
Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. Water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow) from ULL, Piney Z and LLL and sediment samples are collected yearly from Piney Z. This information is used to determine the health of the Lafayette system and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Although Alford Arm contains areas of standing water, the vast majority is covered by dense stands of both submergent and emergent wetland vegetation. Because of the dense vegetation and low water conditions, samples could not be collected for most of 2010, and no samples were collected in 2011-2015. The station was eliminated in 2015.

Upper Lake Lafayette



The typically phosphorus-limited Upper Lake Lafayette is the westernmost lake in this system. The most dominant feature of Upper Lake Lafayette is the sinkhole (Lafayette Sink) located in the northeastern portion of the lake and drains into the Floridan Aquifer. Much of the water entering Upper Lake Lafayette ultimately discharges into the sink area. As a result, the area and volume of the lake is highly variable. During typical rainfall periods, the area around Lafayette Sink becomes a 354-acre lake, but following dry periods, the lakebed can drain almost completely into the sinkhole. The heavily urbanized Northeast Drainage Ditch and Lafayette Creek are the primary sources of water for the lake. Three other minor contributing sources are two small tributaries to the north of the lake and Lake Piney Z.

Approximately 74% of the 14,792-acre Upper Lake Lafayette watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

The U.S. EPA established a TMDL on Upper Lake Lafayette in March 2012 that requires a 36% reduction in Total Phosphorus. Upstream of Upper Lake Lafayette is a stormwater facility known as the Weems Pond Regional Stormwater Treatment Facility (Weems Pond). The City of Tallahassee converted Weems Pond into an alum-injection facility that was brought online in October 2015. The retrofit of the facility is hoped to reduce pollutant loads leaving the pond, which flow downstream through the Northeast Drainage Ditch and into Upper Lake Lafayette.

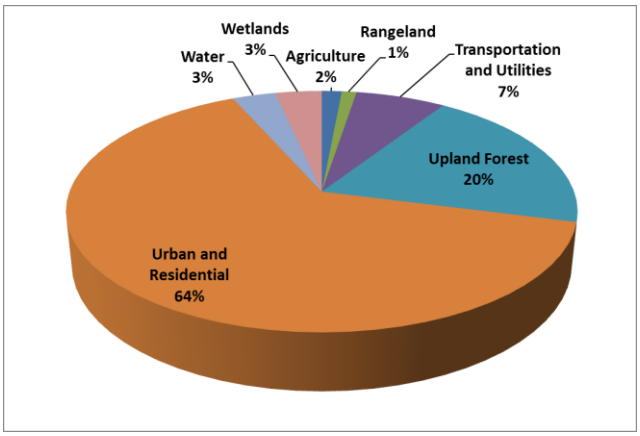


Figure 1. Upper Lake Lafayette watershed land use.

The construction of the stormwater treatment facility for a single-family subdivision immediately north of Upper Lake Lafayette limited Leon County staff access to the sample location and prevented water quality sampling during the latter part of the 2021 and early 2022. Due to atypical water levels, no samples were collected in 2024.

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

The nutrient thresholds and results for Upper Lake Lafayette are found in **Table 1**. When the NNC requirements were met, chlorophyll-a and total phosphorus exceeded the state criteria several times over the sampling period.

Table 1. NNC thresholds and results for ULL. Results in bold signify exceedances of the State criteria.

Clear Lake, High Alkalinity	Chlorophyll-a 20.0 µg/L	TN Threshold 1.05-1.91 mg/L	TP Threshold 0.03-0.09 mg/L
2004	2.3	0.33	0.04
2005	**25.2**	0.81	**0.10**
2006	3.3	0.56	0.09
2007	4.9	0.60	0.07
2008	**24.5**	0.60	**0.15**
2009	6.9	0.43	0.08
2010	6.9	0.77	0.07
2011	**32.7**	0.68	**0.10**
2012	**31.0**	0.90	**0.15**
2013	16.8	0.79	-
2014*	-	-	-
2015	**36.7**	0.88	**0.12**
2016	-	-	-
2017	**27.1**	**1.24**	**0.08**
2018	-	-	-
2019	10.9	1.55	**0.14**
2020	5.5	0.39	**0.10**
2021-2025*	-	-	-

* Due to access issues, construction activities or atypical water levels, staff could not collect the appropriate number of samples and thus could not determine the NNC.

This is the result of urbanized inflow streams combined with fluctuating lake levels and rainfall. Oftentimes, the reduced lake volume concentrates incoming pollutants, thus reducing the lake's ability to assimilate incoming nutrients.

Fish Kills

Upper Lake Lafayette has a history of fish kills. Elevated phosphorus and nitrogen levels cause increased microbial activity, that in turn causes lower oxygen levels in the water. In this lake's case, fish, already stressed from being in the concentrated area of the sinkhole, died from low oxygen levels.

For more information regarding fish kills, please visit: https://myfwc.com/research/saltwater/health/abnormalities/causes/

Other Parameters

Historically, elevated Biological Oxygen Demand (BOD) results (average is 4.1 mg/L) have been an issue since Leon County sampling began in 2006 (**Figure 2**). Like the elevated nutrients and chlorophyll-a levels, urbanized inflow streams and a fluctuating lake volume appear to be detrimentally affecting water quality.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a thirty-day period was exceeded during the 4th quarter sampling event in 2022 (430 CFU), the 2nd quarter of 2023 (900 CFU), and the 4th quarter of 2025 (575 CFU). Based on anthropogenic land use, the exceedances could possibly be the result of development in the watershed. Or, based on the abundance of wildlife in the area, could be the result of wild animals.

Conclusions

Upper Lake Lafayette has a history of elevated nutrients, chlorophyll-a levels and microbial

activity and continues to not meet the NNC. The *E. coli* water quality limit was exceeded during the 4th quarter 2025 sampling event. Urbanized inflow streams combined with fluctuating lake volume exacerbated the various challenges that Upper Lake Lafayette continues to have.

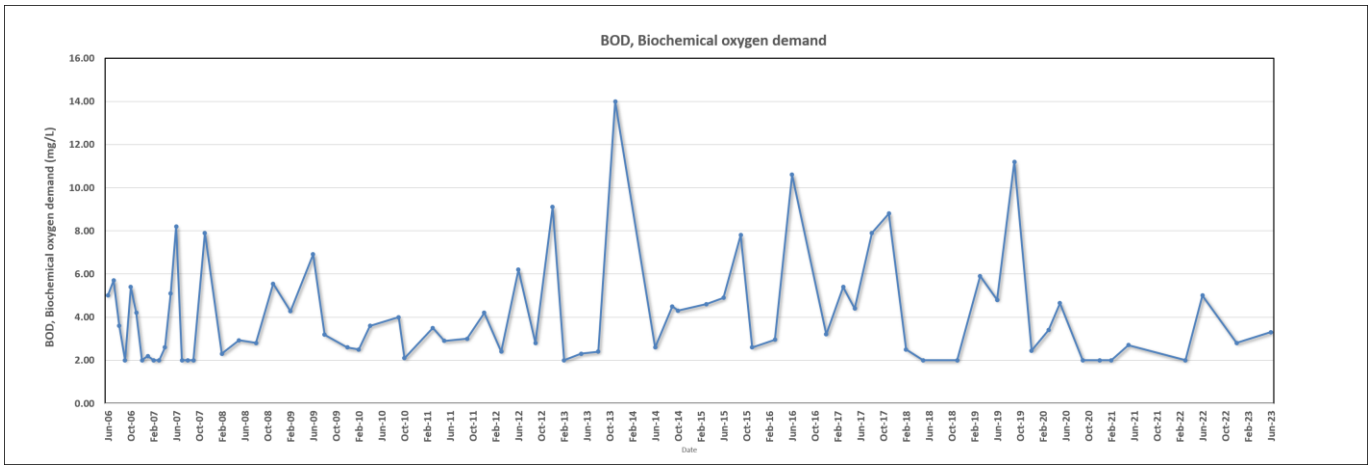
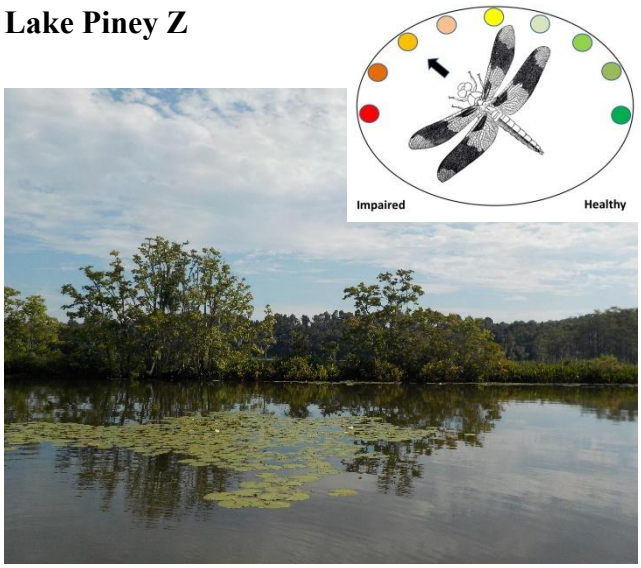


Figure 2. BOD results for Upper Lake Lafayette.

Lake Piney Z



Lake Piney Z is a 228-acre waterbody located between Upper Lake Lafayette and Lower Lake Lafayette which consists primarily of an open water system, although substantial stands of vegetation were historically present within the lake.

Approximately 45% of the 691-acre Piney Z watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 3**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

Lake Piney Z can discharge to Lower Lake Lafayette via two outfalls located on the east end of the lake and/or discharge to Upper Lake Lafayette via a ditch and outfall located on the west side of the lake. Lake Piney Z receives stormwater inflow from the Piney Z Plantation development and the Swift Creek Middle School stormwater pond on its northern shore, from a few holding ponds near the southern portion of the lake and from the dirt road that surrounds the lake.

In 1997, Lake Piney Z was drawn down and organic matter was scraped from the bottom and used to construct fishing fingers extending north from the southern bank. Following construction of the fishing fingers, the lake was restocked with game fish. Currently, the Florida Fish and Wildlife Conservation Commission, in cooperation with the City of Tallahassee, manages Piney Z as a Fish Management Area.

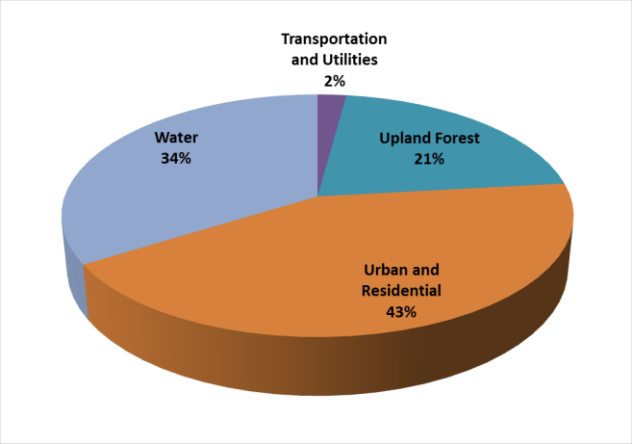


Figure 3. Lake Piney Z watershed land use.

Results

Nutrients

The nutrient thresholds and results are found in **Table 2**. Lake Piney Z chlorophyll-a and nutrient values regularly exceeded the NNC during the period of record with the latest exceedance in 2025.

Excessive chlorophyll-a and nutrient levels are the result of past lake management practices. The overuse of herbicides and the addition of grass carp to Piney Z have led to an almost completely open water system. Nutrients are being assimilated by algae instead of being taken up by vascular plants, leading to massive and long-lasting algal blooms. Fortunately, management practices have changed, most notably with the replanting of emergent vegetation and the re-establishment of other native vegetation via the natural seedbank. With recent lower levels of chlorophyll-a and nitrogen, it is hoped that long term ecosystem health will continue to improve.

Floral Assessment

The Lake Vegetation Index score for Piney Z was 52, placing the lake's vegetative community in the healthy category.

Table 2. NNC thresholds and results for Lake Piney Z. Results in bold signify exceedances of the State criteria.

Clear Lake, Low Alkalinity	Chlorophyll-a 6.0 µg/L	TN Threshold 0.51-0.93 mg/L	TP Threshold 0.01-0.03 mg/L
2004	**6.5**	0.45	**0.04**
2005	**13.0**	**0.78**	**0.05**
2006	**25.2**	**0.70**	**0.08**
2007	3.0	**0.96**	**0.04**
2008	**8.8**	**0.73**	**0.04**
2009	4.43	**1.33**	**0.06**
2010	**17.2**	**1.06**	**0.07**
2011	**36.4**	**1.28**	**0.08**
2012	**32.6**	**1.65**	**0.06**
2013*	**27.0**	**1.12**	-
2014	2.70	**1.05**	**0.04**
2015	9.0	0.67	**0.04**
2016*	-	-	-
2017	9.5	**1.01**	**0.05**
2018	6.5	0.84	**0.04**
2019	9.3	0.87	**0.05**
2020*	-	-	-
2021	1.9	0.58	0.03
2022	5.8	0.82	**0.04**
2023	4.5	0.68	**0.04**
2024	**6.8**	**0.62**	**0.04**
2025	5.7	0.70	**0.04**

* Due to low water levels or access issues, staff could not collect the appropriate number of samples and thus could not determine the NNC.

Forty-one species were found during the survey (**Table 2**). Watershield (*Brasenia schreberi*), American lotus (*Nelumbo lutea*), fragrant waterlily (*Nymphaea odorata*), and the invasive exotic Cuban bulrush (*Oxycaryum cubense*) were the co-dominant species at the lake. Other native vegetation included buttonbush (*Cephalanthus occidentalis*), red maple (*Acer rubrum*), and maidencane (*Panicum hemitomon*).

Unfortunately, several species of non-native exotic plants were found in Lake Piney Z and are a concern for the future health of the lake. The Florida Exotic Invasive Species Council considers water hyacinth (*Eichhornia crassipes*), wild taro (*Colocasia esculenta*), hydrilla (*Hydrilla verticillata*) torpedo grass (*Panicum repens*), and Chinese tallow (*Sapium sebiferum*), all Category I Invasives. Alligator weed (*Alternanthera philoxeroides*) is a Category II Invasive that was found during the lake survey. The aforementioned Cuban bulrush (*Oxycaryum cubense*) and water spangles (*Salvinia minima*) are additional nonnative exotic plants found in the lake. For additional information about Category I and II invasive exotic plants, please go to the Florida Exotic Invasive Species Council: https://www.floridainvasives.org/

Click here for more information on the Lake Piney Z LVI.

For additional information about the LVI please go to the Florida Department of Environmental Protection webpage: https://floridadep.gov/dear/bioassessment/content/bioassessment-methods#Lakes.

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Piney Z due to elevated levels of mercury.

Click here for more information about fish consumption advisories.

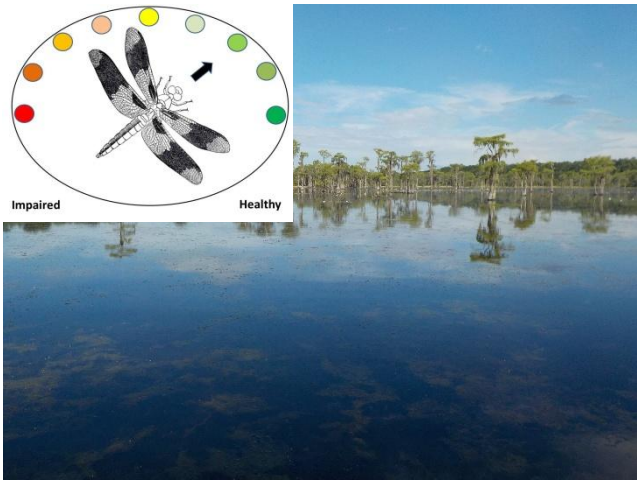
Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Piney Z did not meet the nutrient threshold for phosphorus for the East Panhandle Region, but nutrient and chlorophyll-a levels appear to be decreasing. Fortunately, lake management practices have changed, most notably with the replanting of emergent vegetation and the reestablishment of other native vegetation via the natural seedbank. The LVI score placed the lake's vegetative community in the healthy category. Other water quality parameters appear to be normal for the area and no other impairments were noted.

Lower Lake Lafayette



Lower Lake Lafayette is the largest of the four lake compartments, covering an area of 1,006 acres and bordered by the Leon County Apalachee Regional Park Solid Waste Facility, Talquin Electric Sewage Treatment Plant and various residential and commercial developments. Lower Lake Lafayette is also home to a wood stork colony.

Approximately 54% of the 36,966-acre Lower Lake Lafayette watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 4**). Increases in stormwater runoff and waterbody nutrient loads

can often be attributed to these types of land uses.

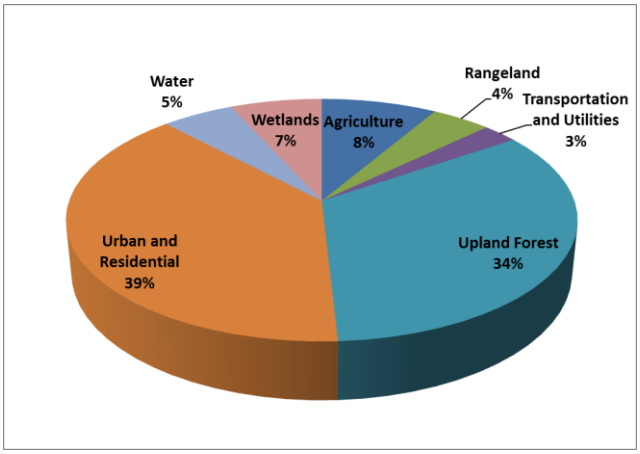


Figure 4. Lower Lake Lafayette watershed land use.

Water from Alford Arm enters Lower Lake Lafayette via pipes located under the FGA railroad track. Discharges from Lower Lake Lafayette occur through an earthen channel on the eastern end of the lake and pass under Chaires Crossroad before entering the wetland system associated with the St. Marks River. Depending on water levels, water from the St. Marks River will flow into Lower Lake Lafayette.

Due to access issues (low water and the extreme amounts of vegetation) Leon County staff have only been able to intermittently sample the system.

Results

Nutrients

The nutrient thresholds and results are found in **Table 3**. The NNC thresholds were not exceeded during the period of record.

Table 3. NNC thresholds and results for Lower Lake Lafayette.

Colored Lakes	Chlorophyll-a 20.0 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	3.0	0.49	0.02
2005	2.9	0.56	0.02
2006	2.3	0.72	0.03
2007	1.9	0.62	0.02
2008	-	-	-
2009	2.2	0.42	0.02
2010	2.6	0.53	0.01
2011-2015*	-	-	-
2016	6.3	0.52	0.02
2017	2.4	0.64	0.02
2018-2025*	-	-	-
2023	4.8	0.58	0.05
2024	6.6	0.65	0.03
2025	-	-	-

* Due to low water levels and the plethora of vegetation, staff could not collect the appropriate number of samples and thus could not determine the NNC.

Lake or Wetland?

Lower Lake Lafayette has gradually transitioned from a lake to what appears and functions like a cypress dominated swamp. Florida Administrative Code 62-302(16) defines a lake as ". . . a lentic fresh waterbody with a relatively long water residence time and an open water area that is free from emergent vegetation under typical hydrologic and climatic conditions. Aquatic plants, as defined in subsection 62-340.200(1), F.A.C., may be present in the open water." As **Figure 5** shows, there is little open water; the open water that currently exists is due to Fish and Wildlife's maintenance of the canoe trails.

Other Parameters

Due to the wetland-like nature of Lower Lake Lafayette, dissolved oxygen (DO) levels can be very low. Staff consider the low DO levels normal for this type of system (**Figure 6**).

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

When the sampling requirements were met, State criteria were not exceeded for the NNC. Due to the wetland-like nature of Lower Lake Lafayette, Staff consider the lake's low DO levels normal for this type of system.



Figure 5. Lower Lake Lafayette.

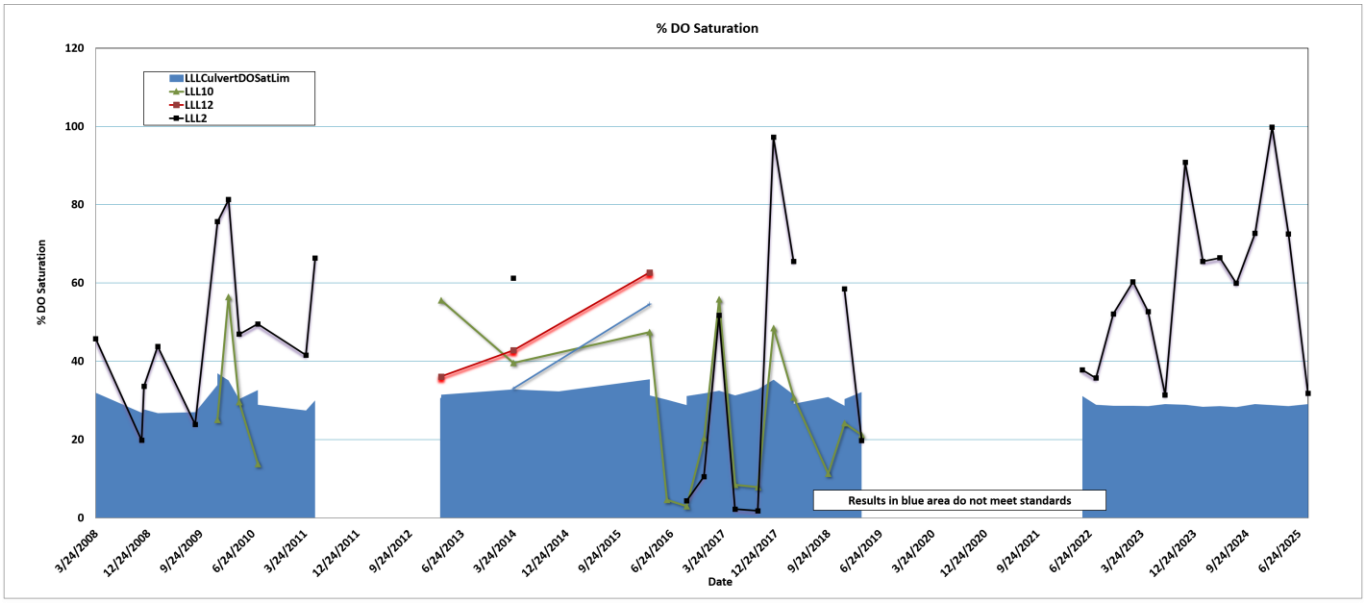


Figure 6. Dissolved Oxygen Percent Saturation results for Lower Lake Lafayette. The data gaps reflect low (or no) water in the system at that time.

Alford Arm



Alford Arm is a 371-acre waterbody which was separated from Lower Lake Lafayette by construction of the FGA Railroad. Approximately 55% of the 30,116-acre Alford Arm watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 7**). Low water crossings constructed in the 1950's affected water flow through the system. Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

Although Alford Arm contains areas of standing water, the vast majority is covered by dense stands of both submergent and emergent wetland vegetation.

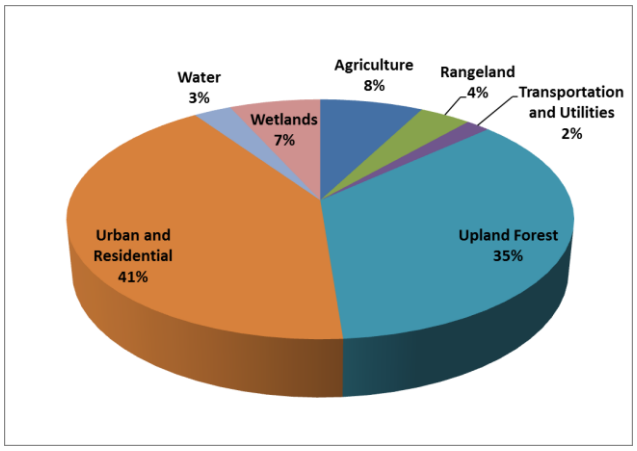


Figure 7. Alford Arm watershed land use.

Because of the dense vegetation and low water conditions, samples could not be collected for most of 2010, and no samples were collected in 2011 through 2014. Because of ongoing conditions, staff eliminated this sampling station in 2015.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for map of watershed – Sample sites L02, L30, LPZ3, LLL2, LLL3, and LLL10.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Northeast Drainage Ditch EcoSummary



The Northeast Drainage Ditch (NEDD) is a heavily urbanized stream located within the City of Tallahassee. The stream flows east and eventually enters Upper Lake Lafayette. Directly upstream of the water quality sampling station is a stormwater facility known as Weems Pond Regional Stormwater Treatment Facility (Weems Pond). The City of Tallahassee converted Weems Pond into an alum-injection facility that was brought online in October 2015. The retrofit of the facility reduces pollutant loads leaving the pond, flowing downstream through the Northeast Drainage Ditch and into Upper Lake Lafayette.

As part of the Weems Road Pedestrian and Street Safety (PASS) project, the drainage system, pedestrian, and bicycle transportation were all improved. Upgrades to the stormwater and roadway drainage system will help alleviate flooding that has historically occurred in the area. The project began in June 2019 and was completed in September of 2020. Water quality sampling resumed in October 2020.

Portions of the NEDD that are located west of Weems Road were historically altered for mosquito control and/or drainage purposes. The greatly altered flow conditions create channel scour during storms and contribute to low base flow east of Weems Road. In comparison, the area east of Weems Road is relatively unaltered beyond the Weems Road right of way; the effects of upstream channelization extend only a short distance downstream of Weems Road. However, effects of the upstream modifications are reflected in the altered flow conditions of the stream.

Approximately 82% of land use in the 7,851-acre NEDD watershed upstream of the sample station is agriculture, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

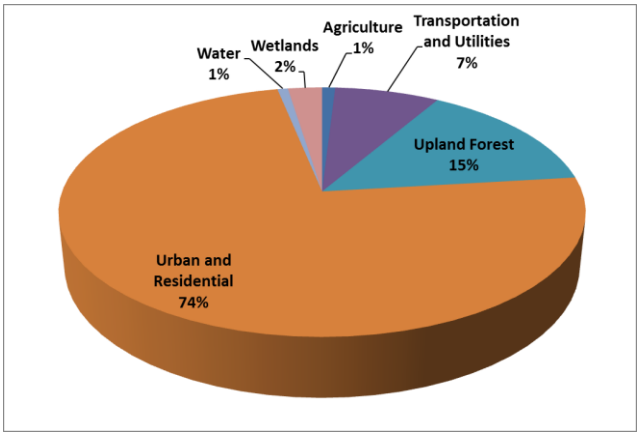


Figure 1. Northeast Drainage Ditch watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state

(e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

In late 2006, the U.S. Environmental Protection Agency (EPA) set a Total Maximum Daily Load (TMDL) target for fecal and total coliforms. The TMDL establishes allowable loadings to the creek that would restore the creek to applicable water quality thresholds. In this case, fecal coliforms would have to be reduced by 63% to meet the criterion of fecal coliforms not exceeding 400/100 mL Most Probable Number (MPN) in 10 percent of the samples. When the TMDL was established, the EPA expected a reduction of 52% to meet the criterion for total coliform. However, the fecal coliform standard in Florida has been supplanted by standards developed for *Escherichia coli* as an indicator of bacterial contamination.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of the NEDD and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

The nutrient thresholds and results are found in **Table 1**. When the NNC requirements were met, nutrient values did not exceed the state criteria.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With very few exceptions, individual values did not exceed the instream criteria for total nitrogen or total phosphorus.

Table 1. NNC Thresholds and results for NEDD.

Northeast Drainage Ditch	Total Nitrogen Threshold 1.03 mg/L	Total Phosphorus Threshold 0.18 mg/L
2006- 2008	-	-
2009	0.17	0.07
2010- 2011*	-	-
2012	0.81	0.10
2013	0.30	0.09
2014	-	-
2015	0.35	0.11
2016	0.27	0.03
2017	0.23	0.02
2018-2020*	-	-
2021	0.20	0.02
2022*	-	-
2023	0.24	0.02
2024	0.24	0.01
2025	-	-

* Due to low water conditions or road work, staff could not collect the appropriate number of samples and thus could not determine the NNC.

Fecal coliforms and Escherichia coli

As mentioned previously, the fecal coliform standard in Florida has been supplanted by the standards developed for *Escherichia coli*. The adopted *E. coli* water quality limit of > 410 in 10% of samples collected over a 30-day period was exceeded one time during the period of record. (**Figure 4**).

Stream Condition Index (SCI) and Habitat Assessment

The results of the Habitat Assessment score characterize the stream habitat in the marginal category (**Table 3**). Substrate availability, stream channelization, and bank stability are some of the key contributors to a low score in this assessment. The stream channel was very disturbed with very little habitat present in the stream. The SCI score was 35 (**Table 4**), placing it at the lowest boundary of the healthy category. For comparison, vial 1 scored 34.21 placing it in the impaired category while vial 2 score a 35.69 placing it in the healthy category. Compared to previous years, the SCI was 38 (healthy) in 2019, and 29 (impaired) in 2021.

Table 3. Habitat Assessment results for NE Drainage Ditch.

NE Drainage Ditch	Score	Category
Substrate Diversity	6	Marginal
Substrate Availability	3	Poor
Water Velocity	13	Suboptimal
Habitat Smothering	8	Marginal
Artificial Channelization	5	Poor
Bank Stability	3, 3	Poor, Poor
Riparian Zone Width	9, 9	Optimal, Optimal
Riparian Vegetation Quality	5, 5	Marginal, Marginal
Final Habitat Assessment Score	**69**	
Interpretation	**Marginal**	

The macroinvertebrate community present at the monitoring site consisted of 34 taxa. The seven very tolerant taxa present accounted for 20.5% of the taxa richness. Only one FDEP sensitive taxa was present in the SCI sample. No single group or taxon exerted a strong numerical dominance of the community. The Ephemeroptera (mayflies), Plecoptera (stoneflies), and Trichoptera (caddisflies) taxa (EPT) are widely regarded as the groups of aquatic insects that contain a large number of pollution sensitive taxa. In total five EPT taxa were recovered in the SCI; two ephemeropteran taxa, and three trichopteran taxa.

Table 4. Stream Condition Index (SCI) results for NE Drainage Ditch.

NE Drainage Ditch	Vial 1	Vial 2
Stream Condition Index Metrics Scores		
Total Taxa	5.22	4.35
Ephemeroptera Taxa	4	2
Trichoptera Taxa	1.43	4.29
% Filter Feeder	7.41	7.26
Long-lived Taxa	3.33	3.33
Clinger Taxa	0	1.25
% Dominance	4.86	5.13
% Tanytarsini Taxa	0	0
Sensitive Taxa	1	1
% Tolerant Taxa	3.55	3.52
SCI Vial Score	34.12	35.69
Stream Condition Index Score	**35**	
Score Interpretation	**Healthy**	

Click here for more information about the Stream Condition Index and Habitat Assessments.

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, the Northeast Drainage Ditch met the nutrient thresholds for the East Panhandle Region. The greatly altered flow conditions continue to create channel scour during storms and contribute to low base flow east of Weems Road. The SCI score placed the system at the lowest boundary of the healthy

category. Other water quality parameters appear to be normal for the area and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site NE Ditch at Weems.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

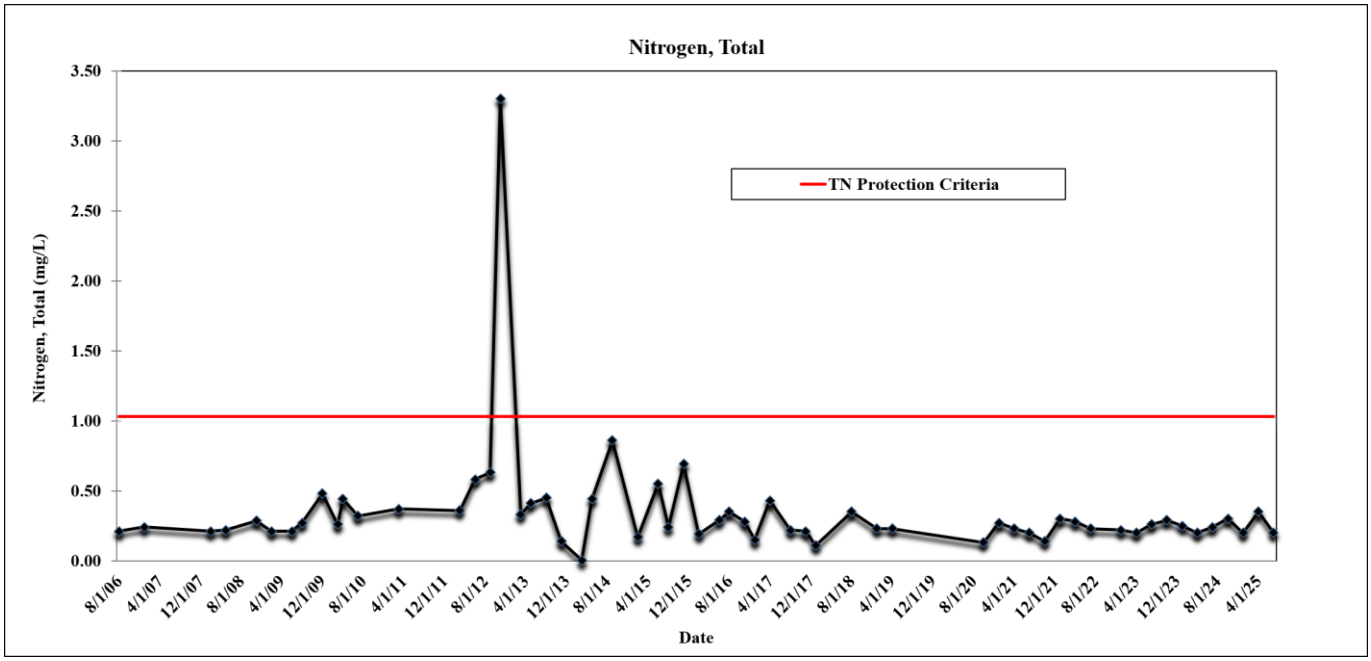


Figure 2. Total Nitrogen results for Northeast Drainage Ditch.

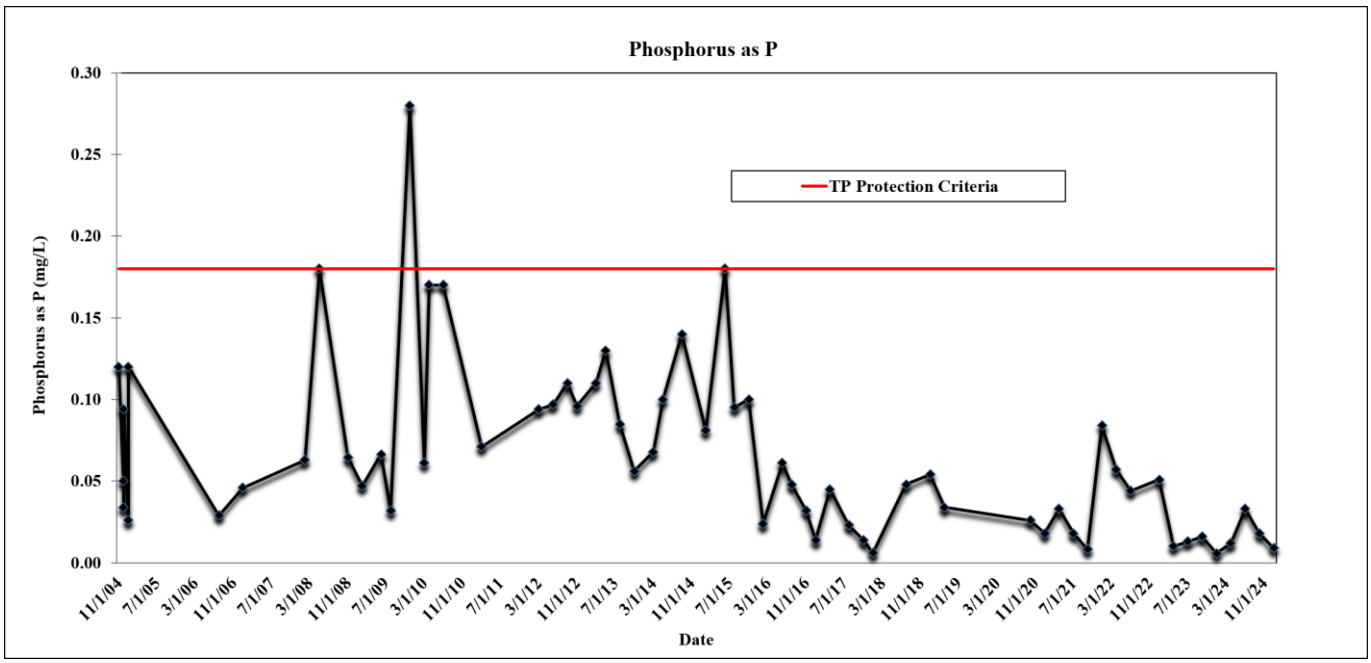


Figure 3. Total Phosphorus results for Northeast Drainage Ditch.

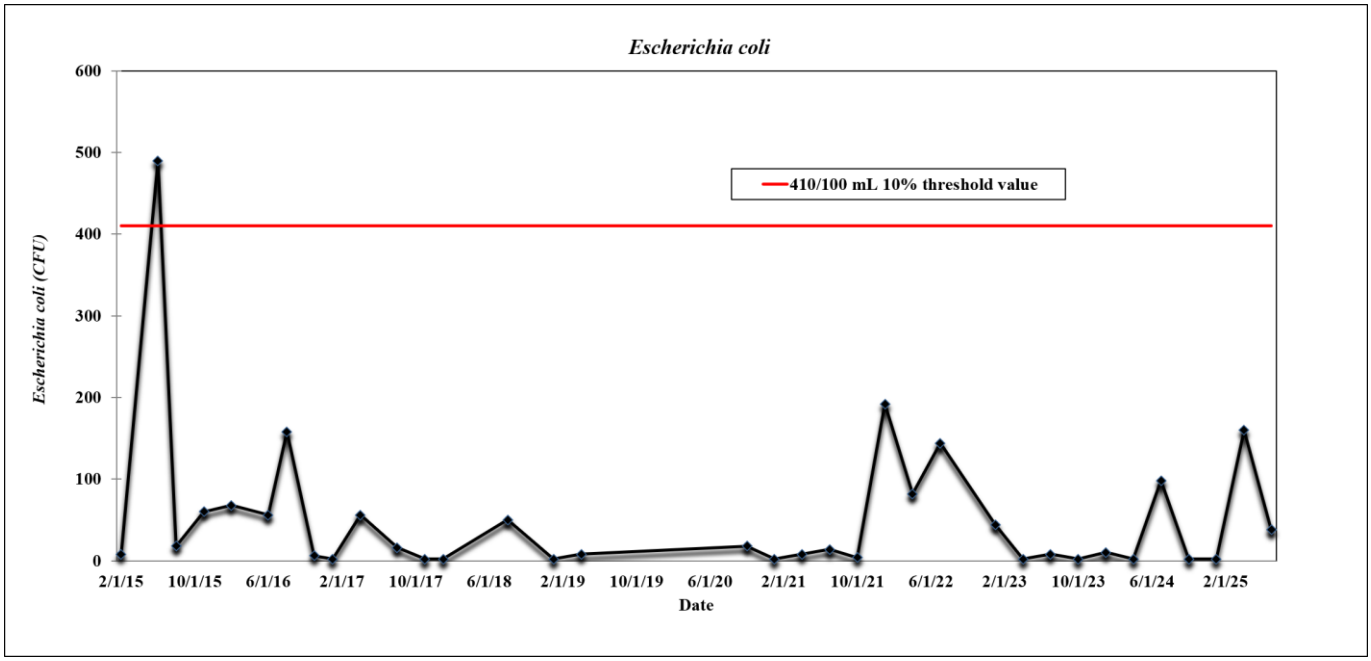
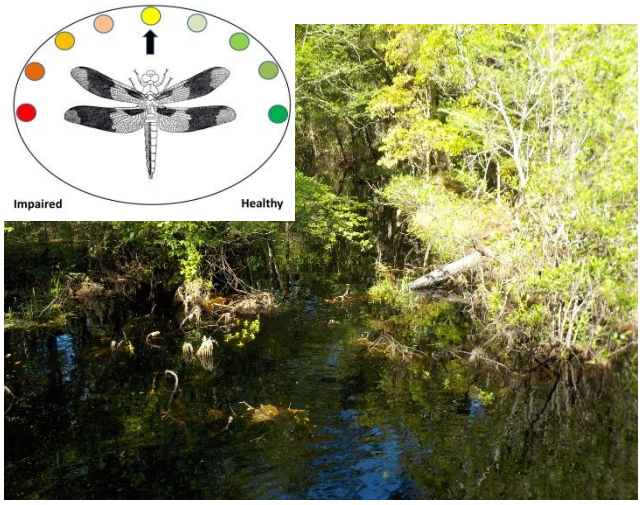


Figure 4. *E. coli* results for Northeast Drainage Ditch.

Unnamed Stream at Chaires Crossroad EcoSummary



The Unnamed Stream at Chaires Crossroad is a highly altered stream/ditch draining Alford Arm and Lower Lake Lafayette and is located in eastern Leon County.

Approximately 54% of land use in the 36,966-acre watershed is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

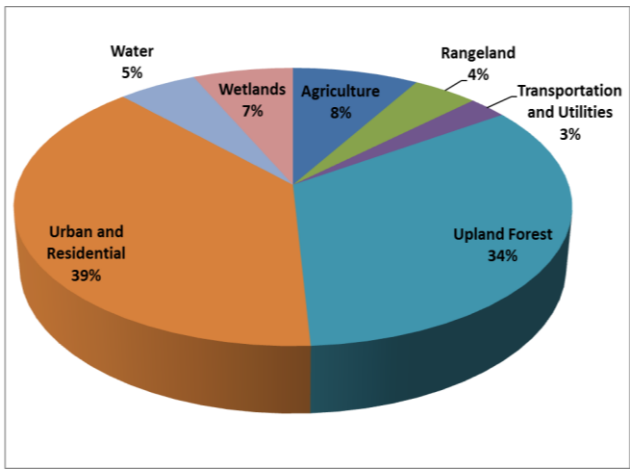


Figure 1. Unnamed Stream at Chaires Crossroad watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of this stream and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low or backflow water conditions, four temporally independent samples per year have only been achieved once (2009) during the period of record (2007-2025). For illustrative purposes, individual data points were plotted to

determine any possible trends (**Figures 2 and 3**). Individual values did not exceed the instream criteria for Total Phosphorus, but did occasionally exceed the nitrogen criteria, with the last exceedance being in 2015.

Dissolved Oxygen

As **Figure 4** shows, the unnamed creek seldom met the Class III criteria for dissolved oxygen. This is not surprising since low gradient, low flow streams often have low dissolved oxygen levels.

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Due to low water conditions, four temporally independent samples per year have only been achieved once (2009) during the period of record. Individual values did not exceed the instream criteria for total phosphorus, but did occasionally exceed the nitrogen criteria, with the last exceedance being in 2015. Dissolved oxygen levels have seldom met the Class III criteria. This is not surprising since low gradient, low flow streams often have low dissolved oxygen levels. Other water quality parameters appear to be normal for the area and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 57.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

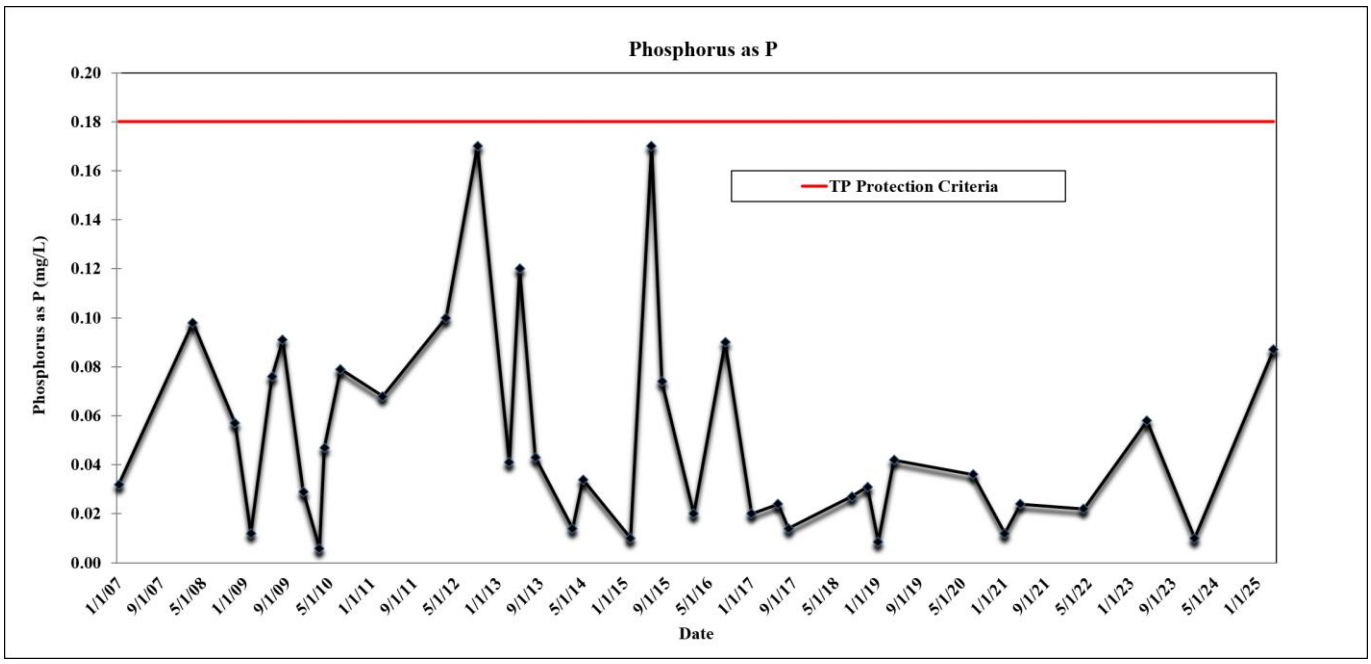


Figure 2. Total Phosphorus results for Unnamed Stream at Chaires Crossroad.

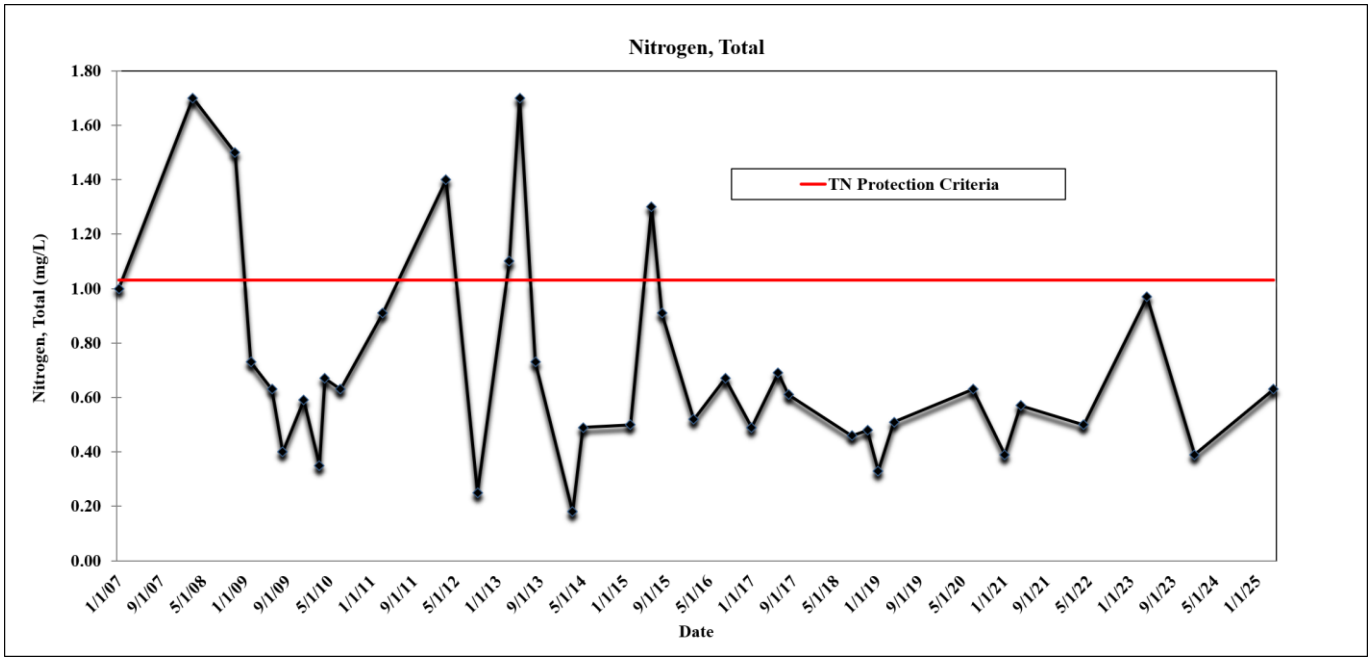


Figure 3. Total Nitrogen results for Unnamed Stream at Chaires Crossroad.

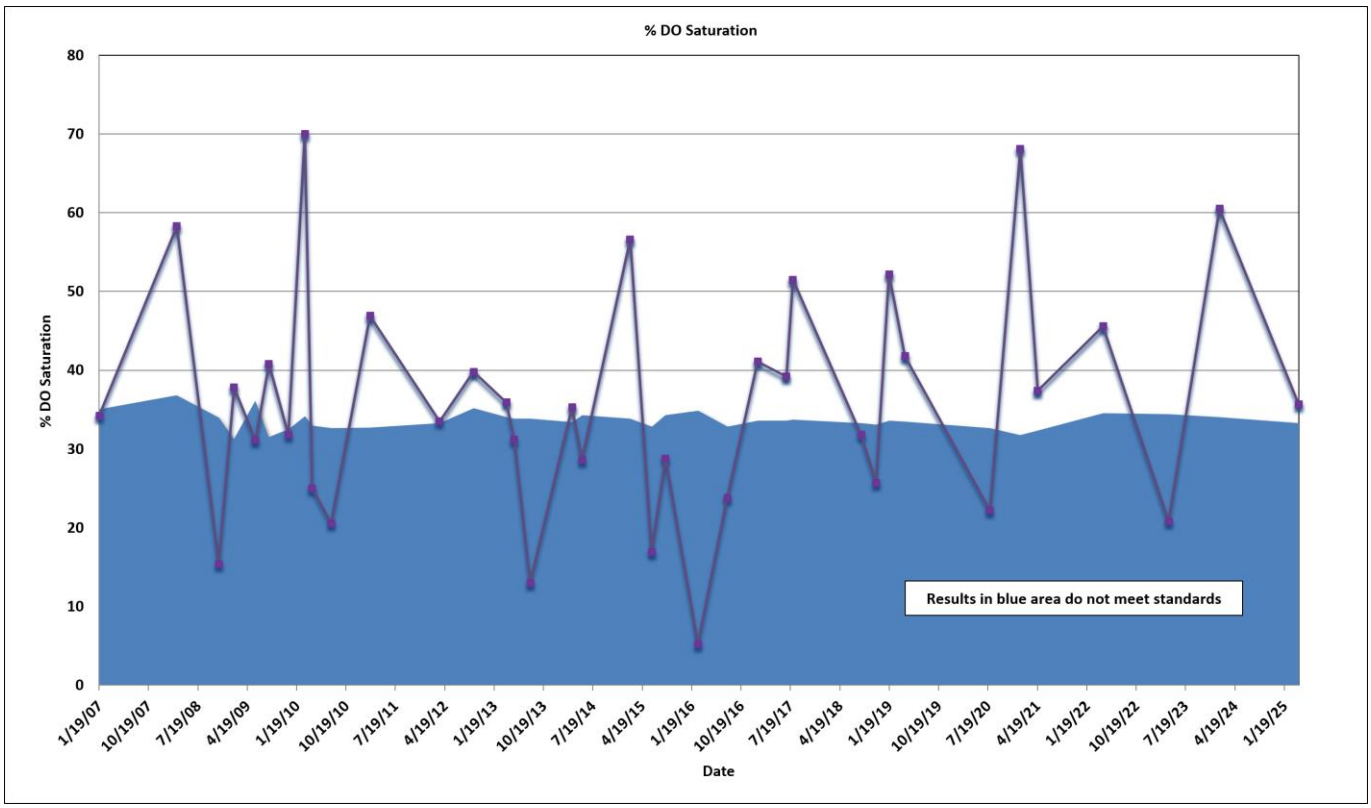


Figure 4. Dissolved Oxygen Percent Saturation results for Unnamed Stream at Chaires Crossroad.

6. Lost Creek Basin

Lost Creek EcoSummary



Lost Creek is a tannic, acidic, phosphorus-limited stream located in southwestern Leon County. The stream eventually enters the Floridan aquifer via the Lost Creek swallet. Dye trace studies have linked this sink to the Leon Sinks - Wakulla Cave System.

Most of the 30,499-acre Lost Creek basin is relatively undeveloped with rangeland, transportation and utilities making up 2% of land use (as shown in **Figure 1**).

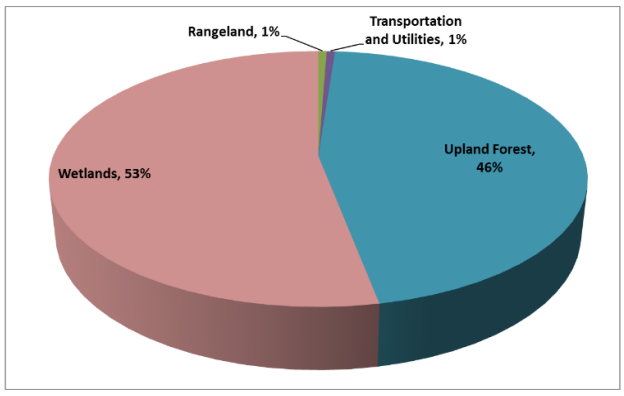


Figure 1. Lost Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Lost Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year could not be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

The Lost Creek water quality station was moved from Bloxham Cutoff to U.S. Forest Road 309 in 2011.

Nutrients

The nutrient thresholds and results are found in **Table 1**.

Total nitrogen levels exceeded state criteria in 2007 and 2014 while phosphorus levels met the criteria for all measured years. For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). As mentioned in previous reports, most of the nitrogen analyzed continues to consist mostly of organic nitrogen (**Figure 4**). Organic nitrogen consists of dissolved organic nitrogen (organic molecules and compounds, viruses, and small bacteria) and particulate organic nitrogen (dead organic matter and living organisms). Because organic nitrogen is "locked up" in organic material, it is not considered immediately available for biological activity.

Fecal Coliforms and Escherichia coli (E. coli)

While the former fecal coliform standard was exceeded several times at Lost Creek, the current *E. coli* standard has never been exceeded since the analysis was implemented in 2015.

Other Parameters

Other water quality parameters appear to be normal for the area, and no impairments were noted.

Conclusions

With the exception of total nitrogen in 2007 and 2014, Lost Creek met the nutrient thresholds for the Big Bend Bioregion. No water quality impairments were noted in 2025.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Table 1. NNC Thresholds and Sample Results for Lost Creek. Results in bold signify exceedances of the State criteria.

Lost Creek	Total	Total Phosphorus
2007	**1.10**	0.03
2008	1.01	0.00
2009	0.78	0.00
2010	0.85	0.02
2011	0.88	0.03
2012	-	-
2013	0.65	0.01
2014	**1.16**	0.02
2015	0.90	0.01
2016-2017	-	-
2018	0.83	0.01
2019-2022	-	-
2023	0.74	0.01
2024-2025	-	-

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site LC at FR309.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

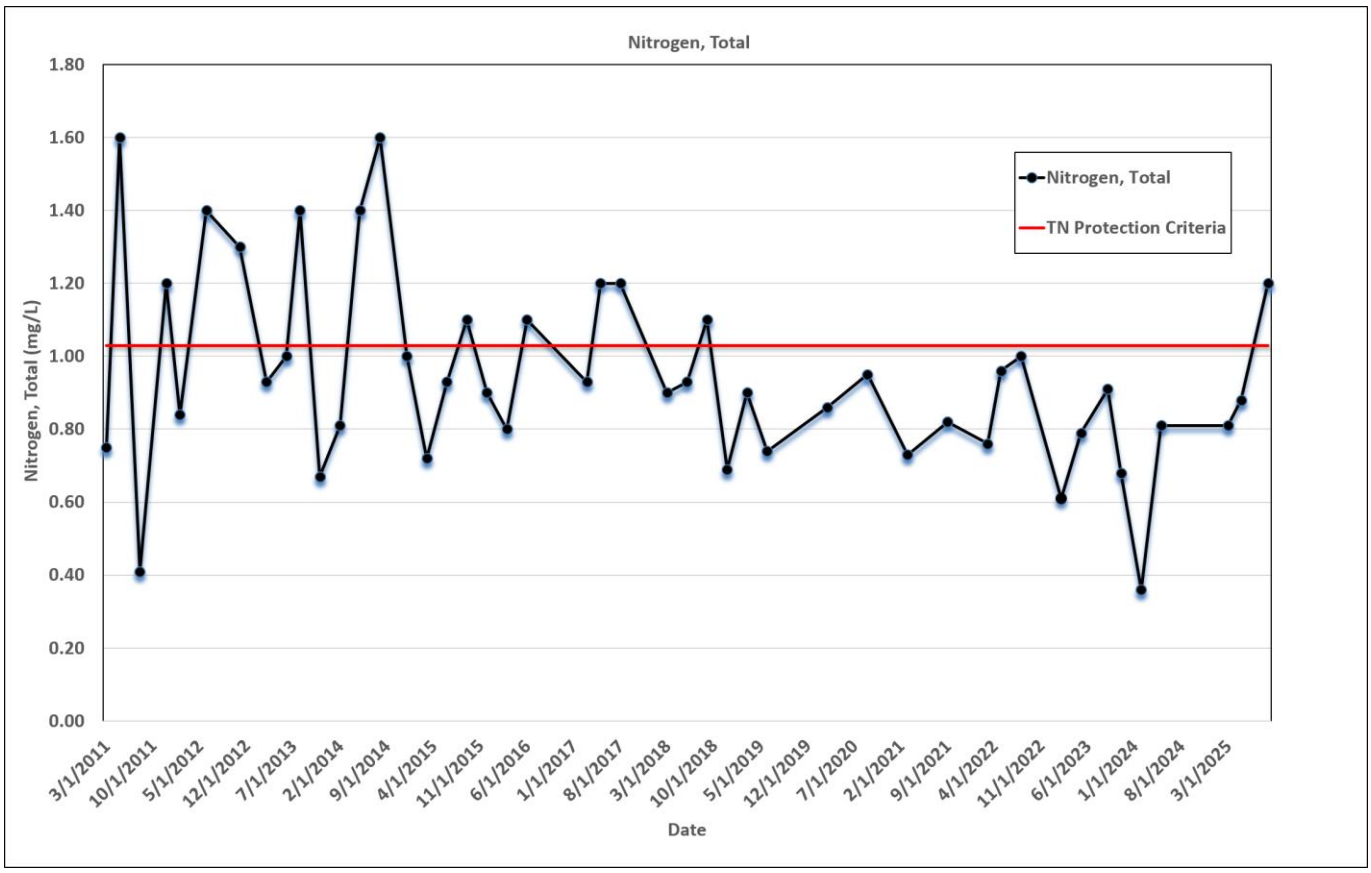


Figure 2. Total Nitrogen results for Lost Creek.

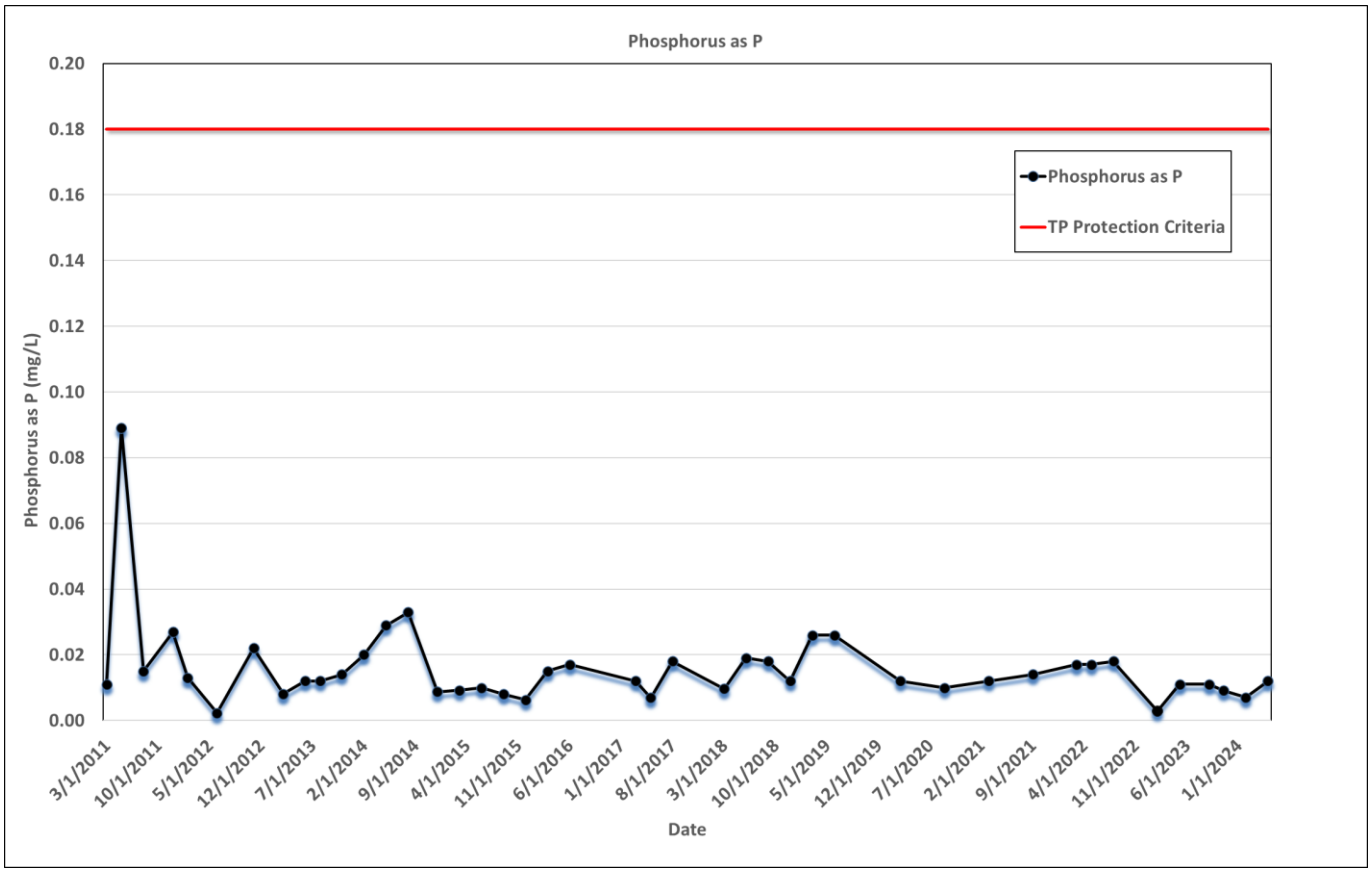


Figure 3. Total Phosphorus results for Lost Creek.

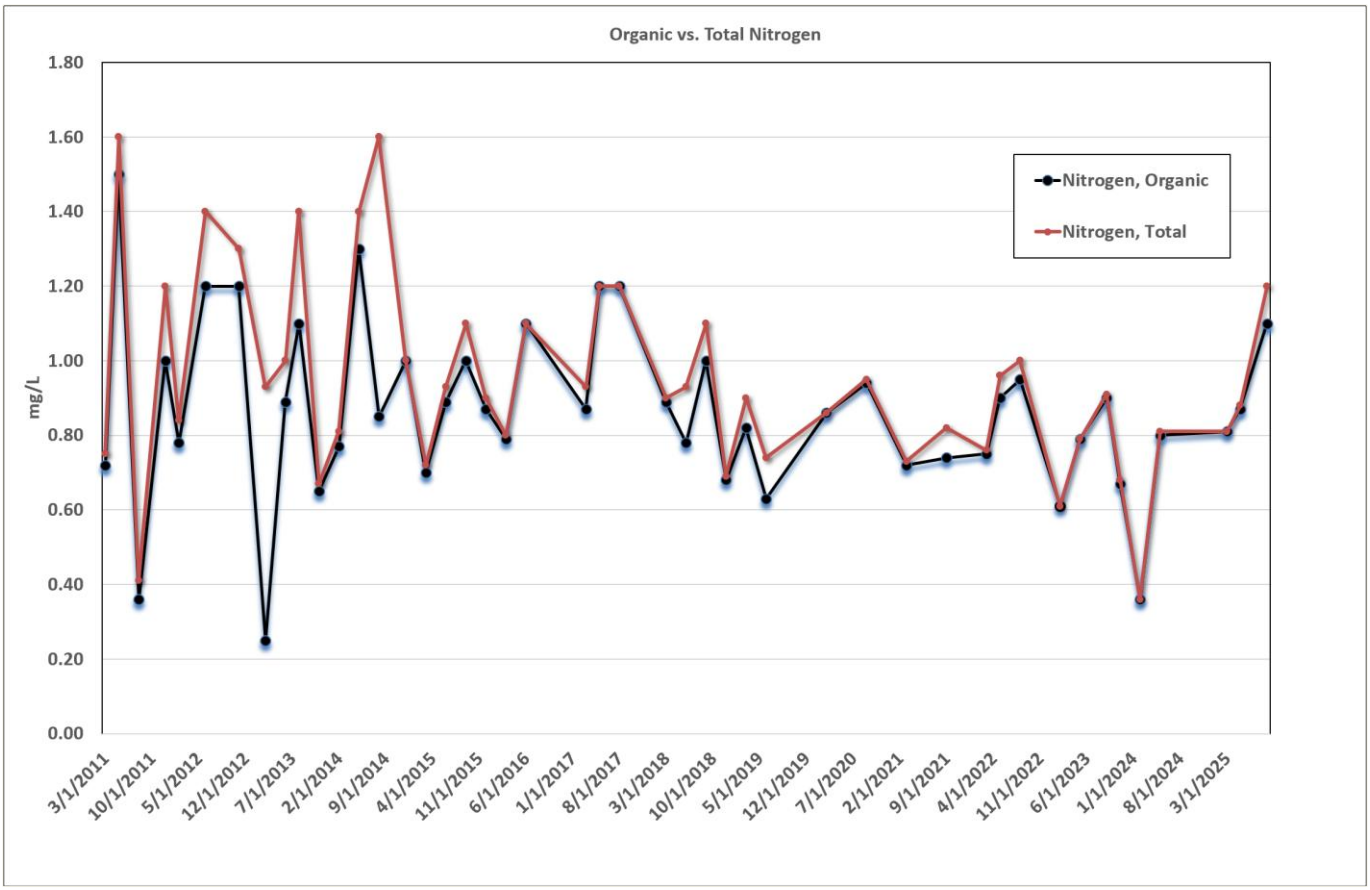
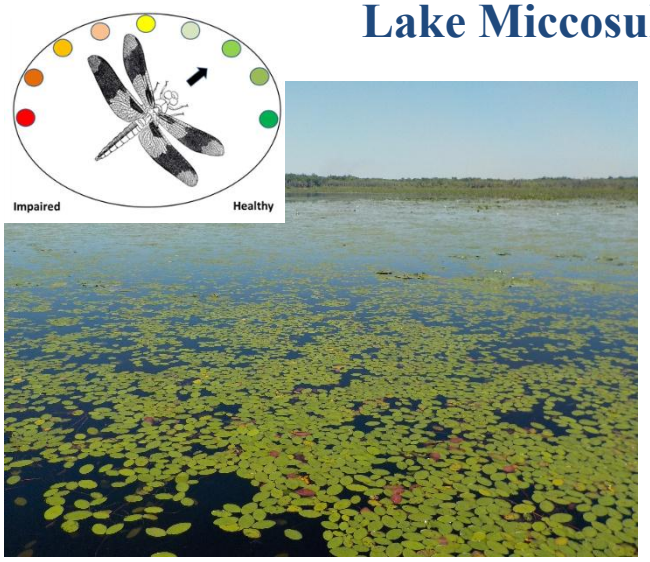


Figure 4. Organic vs. Total Nitrogen results for Lost Creek.

7. Lake Miccosukee Basin

Lake Miccosukee EcoSummary



Lake Miccosukee is a 6,257-acre, phosphorus-limited lake that forms the northeastern border of Leon County. Lake Miccosukee is considered a shallow, prairie lake which historically drained via sinkholes, becoming nearly dry in the process. The result of the natural drawdowns was a large reduction in the amount of organic matter content found in the bottom sediments.

In 1954, a control structure was constructed around the northern sinkhole and a wooden weir constructed at the southern end of the lake to stabilize water levels. Water level stabilization led to increased emergent vegetation in the lake, so that vegetation covered as much as 80% of the lake's surface. By taking up space and decreasing oxygen levels, the increased vegetation also contributed to the diminishment of the fish population and increased the amount of organic material in the sediment.

Because of rising concerns about the health of the lake, the control structure gate was opened during the 1999 drought, allowing part of the lake to drain into the aquifer via the sinkhole. Several areas of the lake were excavated, and part of the lake bottom was burned during the drawdown. The burning and excavation led to increased lake volume and removed a portion of the organic rich sediment. After tropical storms Allison and Barry passed through the area in 2001, Lake Miccosukee quickly refilled. A second drawdown was done in 2012. At that time, prescribed burning was performed on a portion of the woody tussocks that float on the lake. Plant maintenance continues to this day.

In 2010, an additional sinkhole developed on the southeast side of the lake. While this sinkhole won't completely drain the lake, it may keep the lake levels lower during dry periods.

Approximately 15% of land use in the 147,861-acre Lake Miccosukee basin is agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

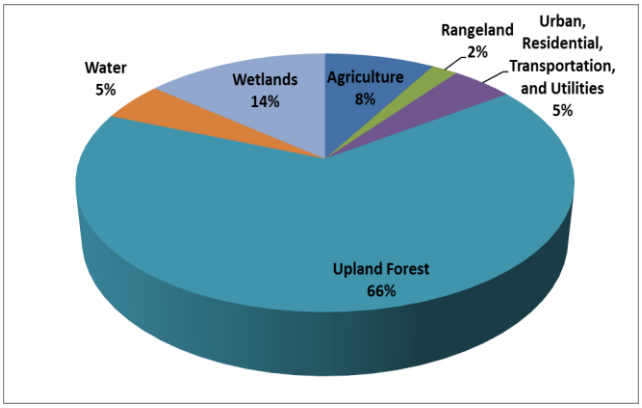


Figure 1. Lake Miccosukee watershed land use.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals.

State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow) and sediment samples are collected annually. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Water quality results and thresholds are found in **Table 1**. When data requirements were met, the NNC were not exceeded.

No exceedances were noted, but nutrient levels have fluctuated over time. Changes in the area around the station may have contributed to changes in nutrient concentrations (**Figure 2**). Previously, the area in the vicinity of station MI2 was dominated by *Nymphaea odorata*, the fragrant water lily. Florida Fish and Wildlife (FWC) contractors enlarged an open water area adjacent to the station that had encompassed the station area. More recently, emergent vegetation has again become more dominant, with the addition of floating tussock islands that have either formed or floated into the sampling area. Because of the anthropogenic disturbances to the vegetative community, fluctuating water chemistry results continue to occur.

Chlorophyll-a

Water quality samples collected by Leon County are analyzed by Pace Analytical Services – Ormond Beach (Pace), with the analysis results provided back to the County for submission to FDEP. In June 2022, FDEP conducted a routine audit of the chlorophyll-a data. This audit revealed that from October 2014 through December 2020, the chlorophyll-a data was reported as "uncorrected chlorophyll-a" and not "corrected chlorophyll-a", as it should have been. Pace has since rectified this error and beginning in January 2021, the chlorophyll-a data were properly reported as "corrected chlorophyll-a". The laboratory also provided Leon County with the "correct chlorophyll-a" data from the affected dates and the information in **Table 1** of this year's Report has been changed to reflect this. This has resulted in chlorophyll-a numbers that are lower than past Reports, which in turn has led to changes to the current Report's narrative.

Dissolved Oxygen (DO)

As **Figure 3** shows, the Lake Miccosukee stations exhibited percent DO saturation values that did not meet Class III water quality criteria. Staff consider the low DO normal for this lake because the stations are shallow and normally covered with vegetation, preventing rapid water exchange with the larger area of the lake. Plant respiration (samples were often taken in the morning hours) and organic sediments also contributed to the low DO saturation values. Because station MI2 has become less vegetated, more water circulation is occurring along with

less plant respiration, thus allowing DO saturation values to increase.

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Miccosukee due to elevated levels of mercury.

Click here for more information about fish consumption advisories.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Miccosukee met the nutrient thresholds for the East Panhandle Region. Changes in the plant community are influencing nutrient and percent DO saturation value levels at station MI2. Other water quality parameters appear to be normal for the area and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site MI2.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Table 1. FDEP's NNC Thresholds and Sample Results for Lake Miccosukee.

Colored Lake	Chlorophyll-a 20.0 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	4.6	0.28	0.02
2005	6.1	0.40	0.03
2006	2.9	0.52	0.02
2007	2.3	0.69	0.02
2008	3.3	0.61	0.01
2009	3.5	0.42	0.02
2010	8.8	0.70	0.03
2011	5.8	0.82	0.04
2012*	-	-	-
2013	11.7	1.05	0.04
2014	4.3	0.86	0.03
2015	7.3	0.78	0.06
2016*	-	-	-
2017	4.9	0.83	0.03
2018	2.7	0.68	0.02
2019	4.7	0.63	0.03
2020	4.6	0.67	0.02
2021	1.3	0.63	0.02
2022	2.8	0.81	0.02
2023	2.6	0.64	0.02
2024	3.1	0.62	0.02
2025	3.1	0.62	0.01

* Due to low water conditions staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

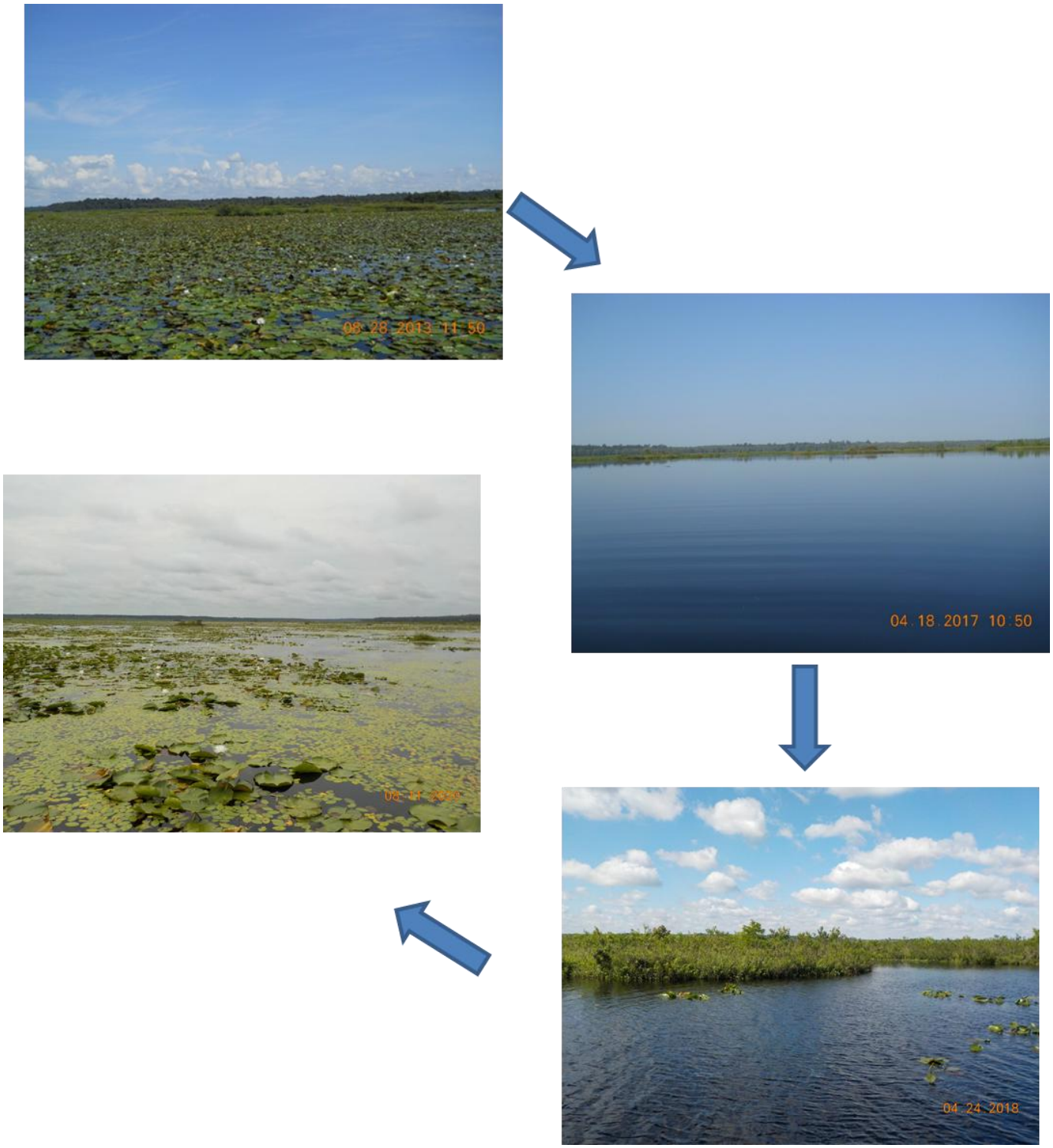


Figure 2. Station MI2 shows the variability of the plant community over time. Photos were taken in: 2013, 2017, 2018, and 2020. The photo at the beginning of the report was taken in 2025.

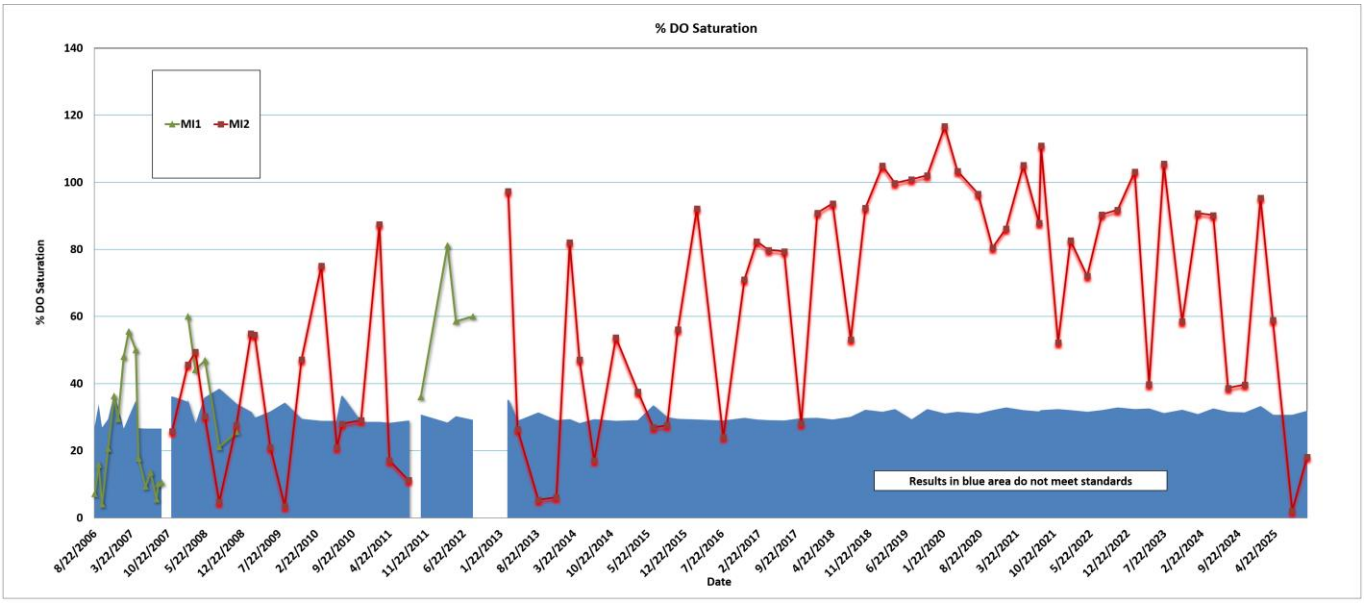
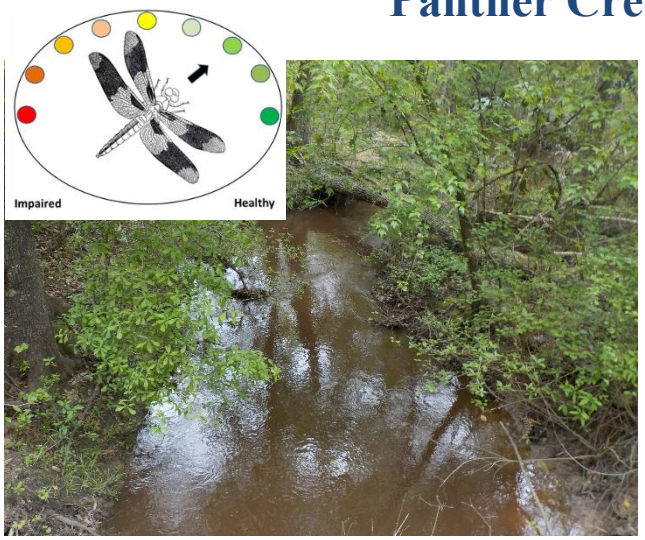


Figure 3. Dissolved Oxygen Percent Saturation results for Lake Miccosukee. Gaps in the data are due to low water, preventing sampling.

Panther Creek EcoSummary



Panther Creek is a tannic, nitrogen-limited stream that flows southeast and eventually drains into Lake Miccosukee.

Approximately 24% of land use in the 3,374-acre Panther Creek watershed is agricultural, rangeland, transportation, utilities or residential/urban (**Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

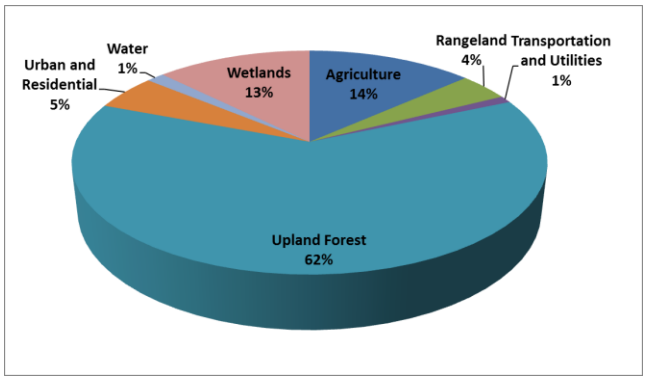


Figure 1. Panther Creek watershed land use.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients and Escherichia coli (E. coli)

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year have only been collected in years 2009, 2013, 2021 and 2023. When criteria were met, results showed that Panther Creek met FDEP's NNC criteria. For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for total

phosphorus or total nitrogen. Sediment laden runoff from a rainfall event in late March of 2025 contributed to high total phosphorus levels in the stream during the April sampling event, as well as elevated turbidity (34 NTU vs. an average of 6.8 NTU) and total suspended solids (120 mg/L vs. an average of 7.8 mg/L). *E. coli* was also elevated during this event **(Figure 4)**. In most cases, since the watershed is relatively undeveloped, most elevated *E. coli* levels are probably the result of wildlife in the area. In this case, the elevated result was most likely due to the aforementioned runoff during the March rainfall event.

Metals

Lead exceeded Class III water quality standards during the 2nd quarter of 2025. Relict anthropogenic sources such as leaded gasoline are most likely to be the cause of lead exceedances. Iron levels exceeded water quality criteria during the 1st and 2nd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.
Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, Panther Creek met the nutrient thresholds for the East Panhandle Region. Sediment laden runoff from a rainfall event in late March of 2025 contributed to high total phosphorus levels in the stream during the April sampling event, as well as elevated turbidity and total suspended solids. *E. coli* was also elevated during this event. The elevated *E. coli* result was most likely due to the aforementioned runoff during the March rainfall event.

Lead exceeded water quality standards during the 2nd quarter of 2025. Relict anthropogenic sources such as leaded gasoline are most likely to be the cause of lead exceedances. Iron levels exceeded water quality criteria during the 1st and 2nd quarter of 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

Other water quality parameters appear to be normal for the area, and no impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 12.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

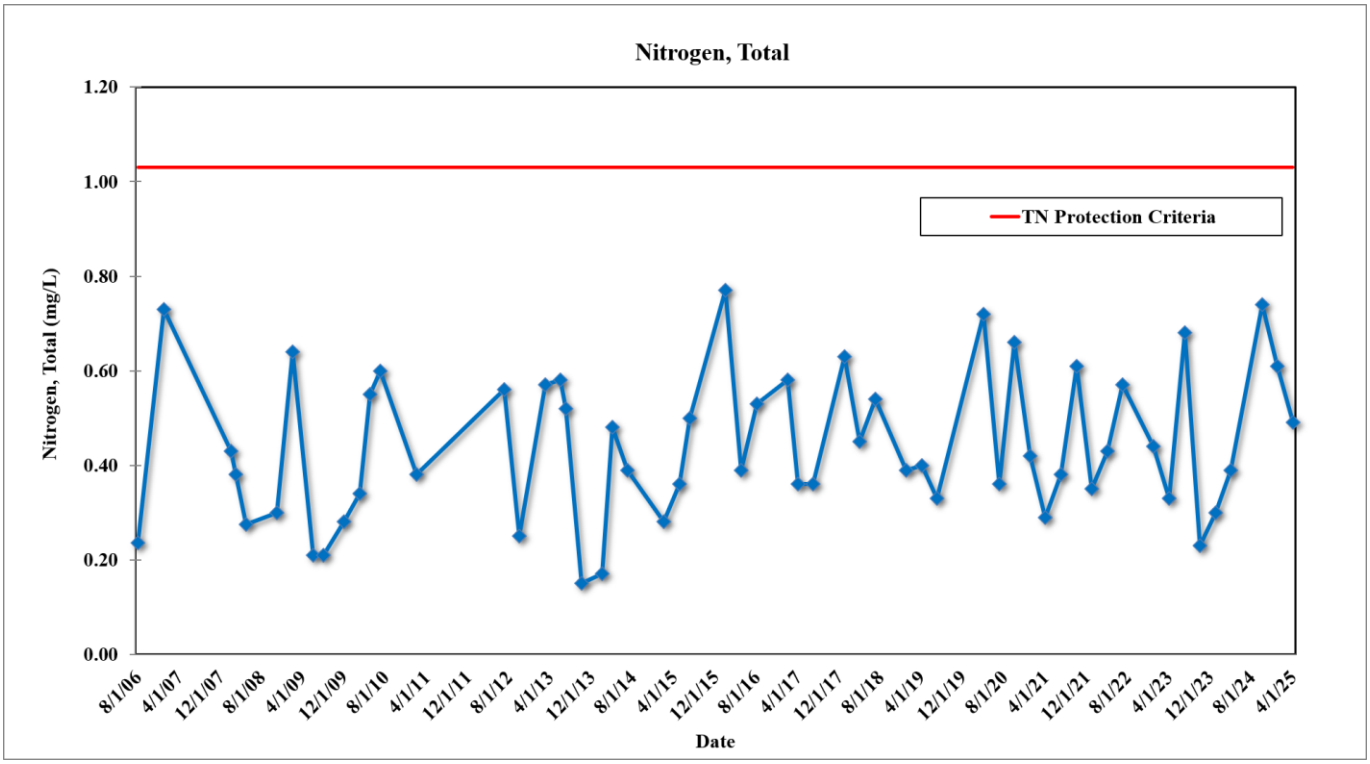


Figure 2. Total Nitrogen results for Panther Creek.

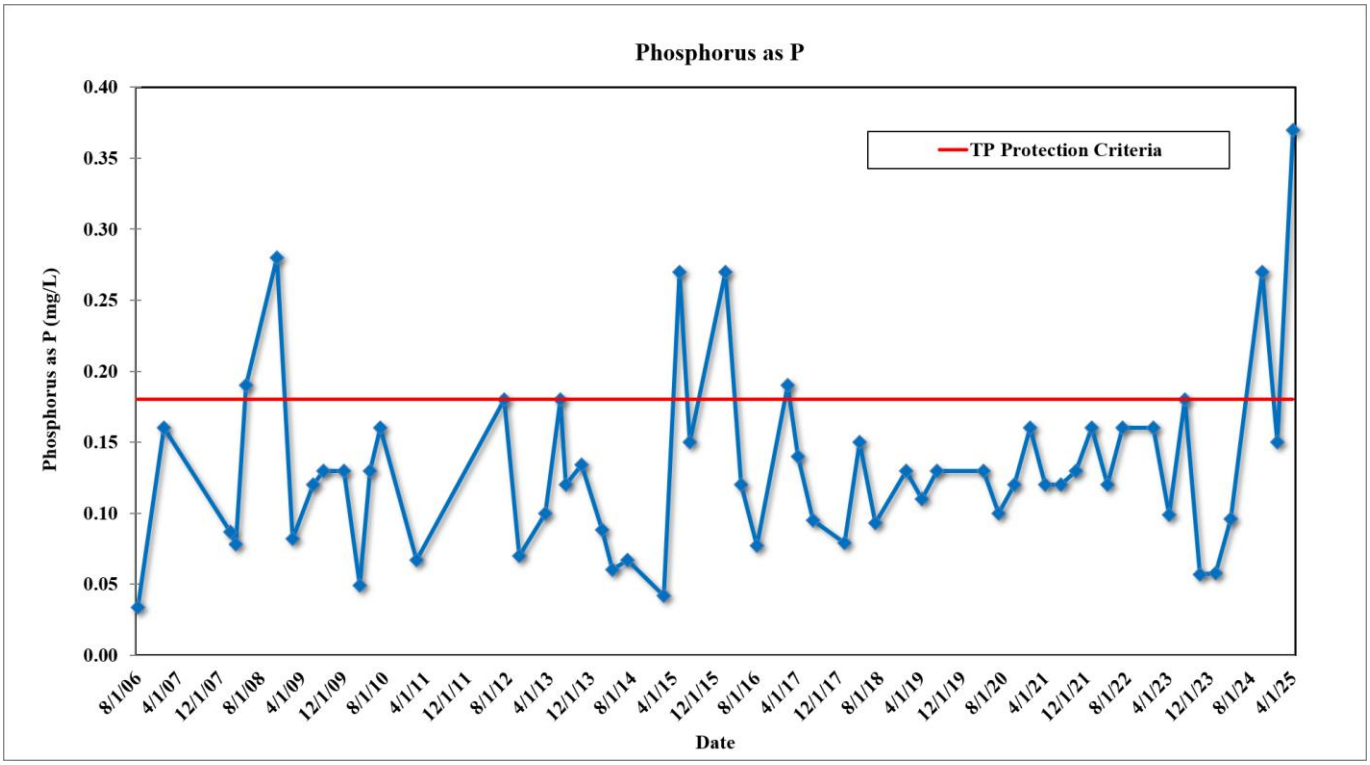


Figure 3. Total Phosphorus results for Panther Creek.

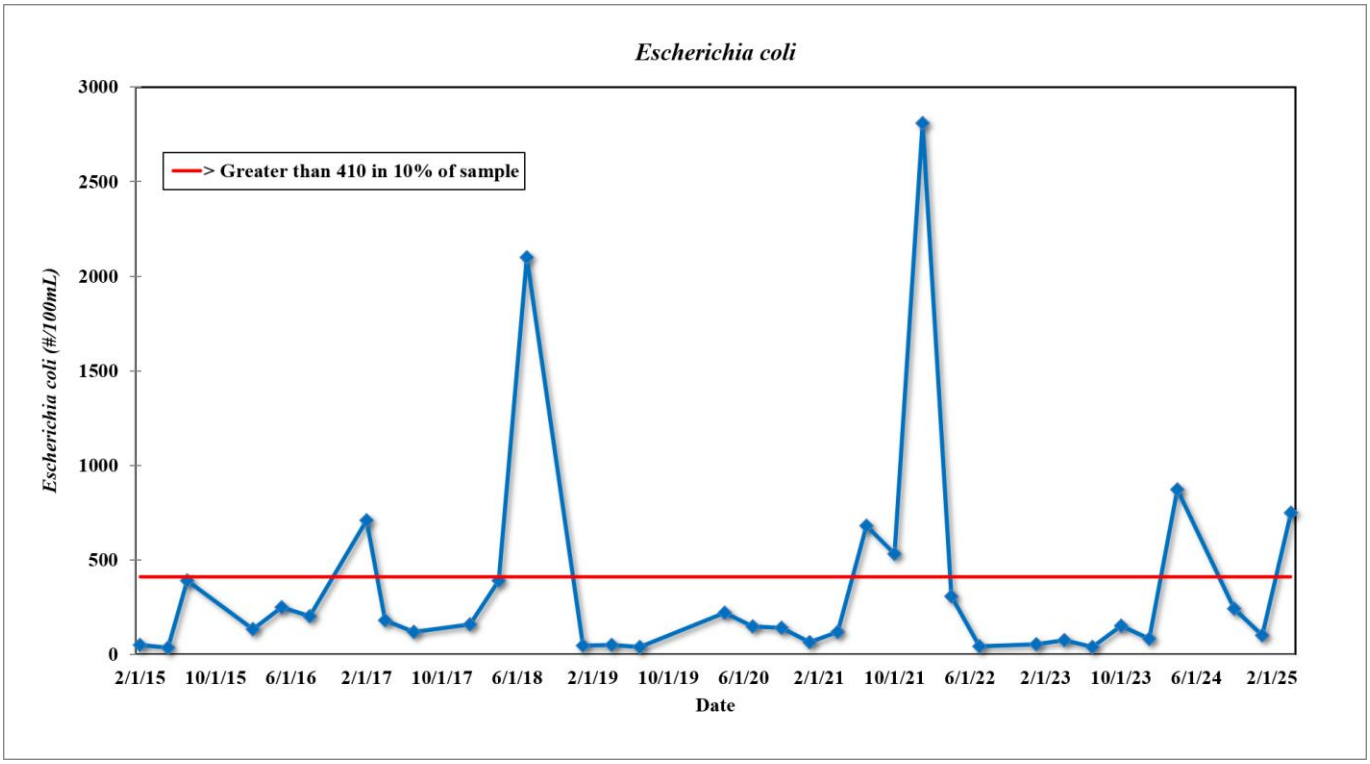
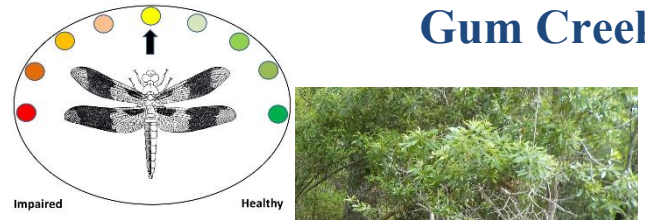


Figure 4. *E. coli* results for Panther Creek.

8. Lake Munson Basin

Gum Creek EcoSummary



Located in central Leon County, the urbanized Gum Creek meanders south through several wetlands, and eventually flows into Munson Slough.

Approximately 53% of the land uses in the 5,291-acre watershed are urban, utilities, transportation, and rangeland (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

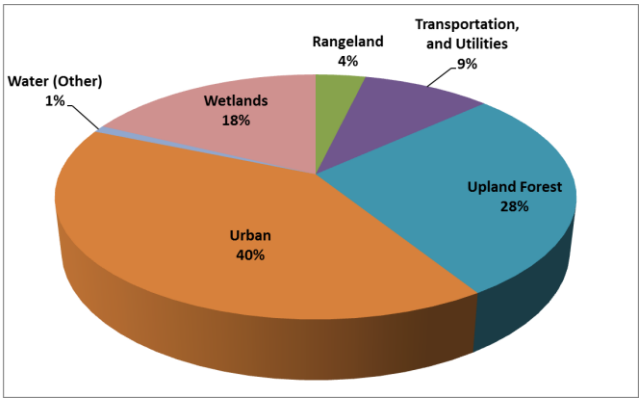


Figure 1. Gum Creek watershed land use.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). The latest Stream Condition Index (SCI) bioassessment was conducted in 2025 on stations GC3 and GC4. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, as well as beaver and construction activities, four temporally independent samples per year could not always be collected from stations. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

As of 2009, Station GC2 is no longer sampled. Due to low water conditions, only one station (GC1) was able to be sampled in 2025.

Nutrients

The nutrient thresholds and results are found in **Tables 1 and 2**. When the NNC criteria could be met, it was shown that no exceedances for nitrogen or phosphorus have occurred since 2006.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for total phosphorus or total nitrogen.

Table 1. NNC threshold and Total Nitrogen results for Gum Creek. Results in bold signify exceedances of the State criteria.

Gum Creek	Instream Protection Criteria				
	TN (1.03 mg/L)				
Year	**GC1**	**GC2**	**GC3**	**GC4**	**GC2T**
2005	0.69	0.63	0.53	0.69	-
2006	**1.10**	0.89	-	0.57	-
2007-2008	-	-	-	-	-
2009	0.66	-	0.53	0.77	0.59
2010	0.93	-	0.82	1.03	0.75
2011-2012	-	-	-	-	-
2013	0.68	-	0.66	-	-
2014	-	-	-	-	-
2015	-	-	-	-	0.71
2016	-	-	0.59	-	-
2017	-	-	0.73	0.95	-
2018	0.56	-	0.65	0.74	-
2019	-	-	0.65	-	-
2020-2021	-	-	-	-	-
2022	0.60	-	0.60	-	-
2023	-	-	-	-	-
2024	0.63	-	-	-	-
2025	-	-	-	-	-

Dissolved Oxygen (DO)

As **Figure 4** shows, Gum Creek station GC2T periodically failed to meet the Class III criteria for DO. Station GC4 failed to meet the limit once over the period of record. Due to beaver activity, the flow at station GC2T is often stagnant or flowing very slowly, leading to low DO levels.

Table 2. NNC threshold and Total Phosphorus results for Gum Creek.

Gum Creek	Instream Protection Criteria				
	TP (0.18 mg/L)				
Year	**GC1**	**GC2**	**GC3**	**GC4**	**GC2T**
2005	0.05	0.05	0.10	0.15	-
2006	0.11	0.13	0.08	0.09	-
2007-2008	-	-	-	-	-
2009	0.06	-	0.05	0.08	0.05
2010	0.05	-	0.05	0.07	0.04
2011-2012	-	-	-	-	-
2013	0.04	-	0.06	-	-
2014	-	-	-	-	-
2015	-	-	-	-	0.05
2016	-	-	0.05	-	-
2017	-	-	0.04	0.05	-
2018	0.05	-	0.05	0.07	-
2019	-	-	0.05	-	-
2020-2021	-	-	-	-	-
2022	0.04	-	0.05	-	-
2023	-	-	-	-	-
2024	0.05	-	-	-	-
2025	-	-	-	-	-

Fecal Coliforms and Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% or more of samples in a 30-day period was occasionally exceeded during the sampling period (**Figure 5**). There has not been an exceedance since 2017.

Metals

Station GC1 exceeded water quality criteria for iron during the 2nd (1.82 mg/L) and 3rd (1.82 mg/L) quarters of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Stream Condition Index (SCI) and Habitat Assessment

Station GC3

The results of the Habitat Assessment score characterize the stream habitat between high marginal and low suboptimal (**Table 3**). As a result of the total stream channel modification, this station contains relatively little habitat outside of a few tree falls creating leaf packs, some root material, a few snags, and the minor rock habitat. In addition, the riparian zone has undergone recent targeted clearing. It is also clear that in-stream habitat conditions are easily altered by heavy rain events.

The SCI score indicates the presence of a stream biological community scoring on the low end of the healthy category (**Table 4**). The SCI for the 2025 sample event scored 35.18. The scores at this station seem to be strongly correlated to long term stream flow, sedimentation, habitat abundance, and habitat disturbance. The last two SCIs collected at the station occurred 2018 and 2021 and scored 50 and 39 respectively. The 2025 SCI score was lower when compared to previous events but remains in the lower portion of the healthy category. However, the taxa list for this SCI collection has a large component of FDEP listed very tolerant forms. Over 61% of the total individuals collected in the SCI were from very tolerant taxa.

The macroinvertebrate community for the 2025 SCI exhibited minimal overall numerical dominance. The most numerous species was the freshwater snail *Menetus dilatatus* (FDEP listed very tolerant), accounting for 66 of the 317 individuals identified within both vials (22%).

From the total combined taxa collected, 18 are listed as very tolerant taxa by the FDEP and only two are listed as sensitive taxa. The Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) taxa (EPT) are widely regarded as groups of aquatic insects that contain large numbers of pollution sensitive taxa. No Plecoptera (stoneflies) were taxa noted in the SCI. Only one Ephemeroptera (mayfly) was collected (*Caenis* sp.), along with a single Trichoptera (caddisflies), the micro-caddis *Oxyethira* sp. The 2025 EPT score for the station is two, which is low for this region of Florida.

Station GC4

The results of the Habitat Assessment score for characterize the stream habitat in the marginal category (**Table 3**). The SCI for the 2025 sample event at station scored 50 (**Table 4**). This places the sample score in the healthy category. The scores at this station seem to be strongly correlated to long term stream flow, habitat availability, and macroinvertebrate drift/recruitment from Gum Swamp. The last two SCIs were collected in 2018 and 2021. During these events, the station scored 53 and 67 respectively, which correlates to healthy and exceptional categorical scores. The 2025 SCI score was lower than the last two collections but remains within the same categorical ranking of the 2018 event.

The macroinvertebrate community for the 2025 SCI exhibited no dominance by any specific

species. The largest number of individuals were represented by the chironomid *Polypedilum illinoense* grp. Of the 296 individuals identified within both vials, 46 (16%) were represented by this group. Chironomid taxa in total represented 52.7% of all individuals.

Of the total combined taxa collected, three are listed as sensitive taxa by the FDEP and ten are listed as very tolerant. The Ephemeroptera (mayflies), Plecoptera (stoneflies) and Trichoptera (caddisflies) taxa (EPT) are widely regarded as groups of aquatic insects that contain large numbers of pollution sensitive taxa. No Plecoptera (stoneflies) or Trichopteran (caddisflies) taxa were noted in the SCI. However, the Ephemeroptera (mayflies) were represented by three taxa, *Caenis amica*, *Caenis diminuta,* and *Labiobaetis frondalis.* However, none are FDEP listed sensitive species. The 2025 EPT score for the station is three, which is low for this region of Florida. The 2021 EPT was five.

Click here for more information about the Stream Condition Index and Habitat Assessments.

Conclusions

Apart from Station GC1's total nitrogen levels exceeding the state criteria in 2006, Gum Creek met the nutrient thresholds in the East Panhandle Region. Station GC2T periodically failed to meet the Class III criteria for DO. Station GC4 failed to meet the limit once over the period of record. While the *E. coli* water quality limit was occasionally exceeded during the sampling period, there has not been an exceedance since 2017. The SCI scores placed both GC3 and GC4 in the healthy category.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Stations GC1, GC2T, GC3 and GC4.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Table 3. Habitat Assessment results for Gum Creek.

Gum Creek Stations	GC3 Score	Category	GC4 Score	Category
Substrate Diversity	11	Suboptimal	11	Suboptimal
Substrate Availability	5	Poor	8	Marginal
Water Velocity	8	Marginal	10	Marginal
Habitat Smothering	7	Marginal	8	Marginal
Artificial Channelization	5	Poor	4	Poor
Bank Stability	6, 6	Suboptimal, Suboptimal	3, 3	Poor, Poor
Riparian Zone Width	7, 7	Suboptimal, Suboptimal	9, 3	Optimal, Poor
Riparian Vegetation Quality	6, 6	Suboptimal, Suboptimal	7, 4	Suboptimal, Marginal
Final Habitat Assessment Score	**74**		**70**	
Interpretation	**Marginal/Suboptimal**		**Marginal**	

Table 4. Stream Condition Index (SCI) results for Gum Creek.

Gum Creek Stations	GC3 Vial 1	GC3 Vial 2	GC4 Vial 1	GC4 Vial 2
Stream Condition Index Metrics Scores				
Total Taxa	9.13	8.70	6.52	7.39
Ephemeroptera Taxa	2	2	4	4
Trichoptera Taxa	1.43	1.43	0	0
% Filter Feeder	1.30	1.59	5.11	3.98
Long-lived Taxa	0	0	6.67	3.33
Clinger Taxa	1.25	0	1.25	1.25
% Dominance	7.63	8.95	9.52	9.29
% Tanytarsini Taxa	6.43	8.25	9.35	9.44
Sensitive Taxa	2	1	2	3
% Tolerant Taxa	0	0.24	2.58	1.96
SCI Vial Score	34.63	35.72	52.22	48.50
Stream Condition Index Score	**35**		**50**	
Score Interpretation	**Healthy**		**Healthy**	

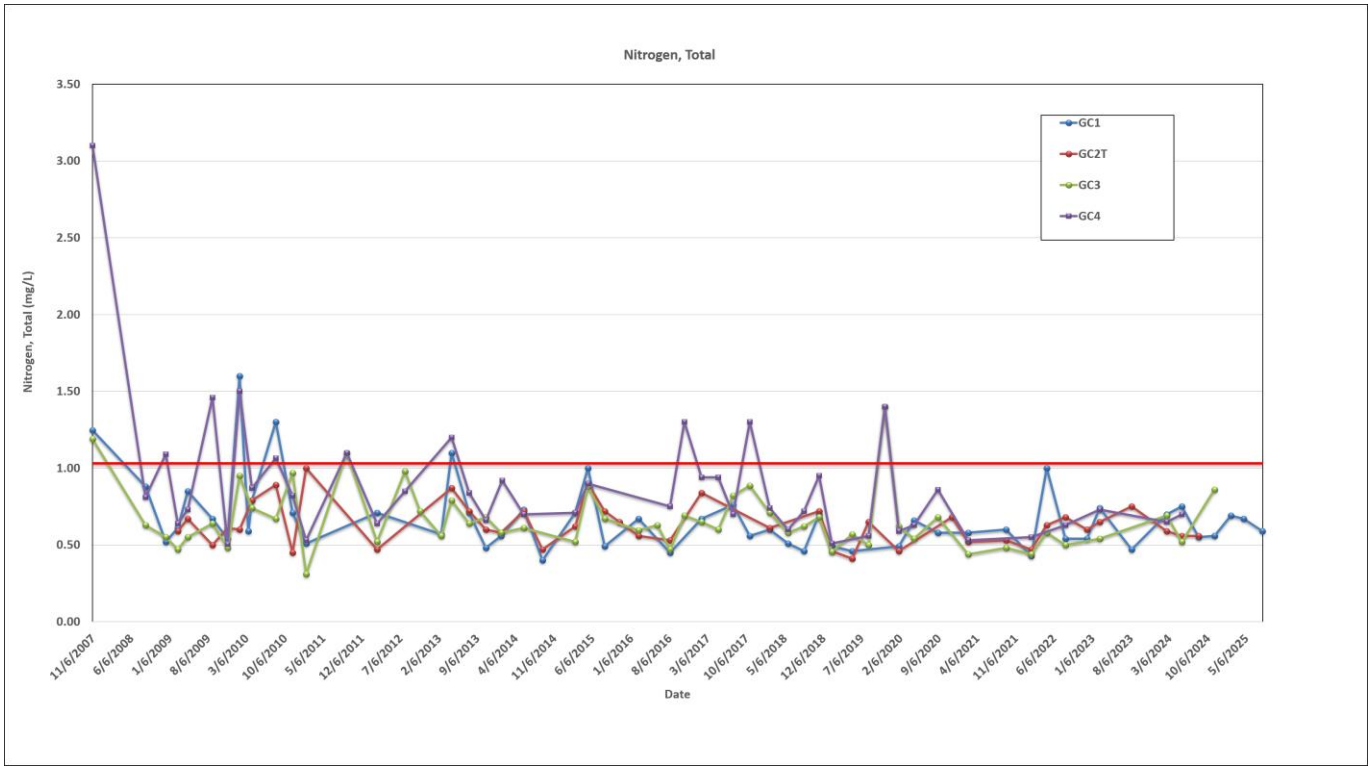


Figure 2. Total Nitrogen results for Gum Creek.

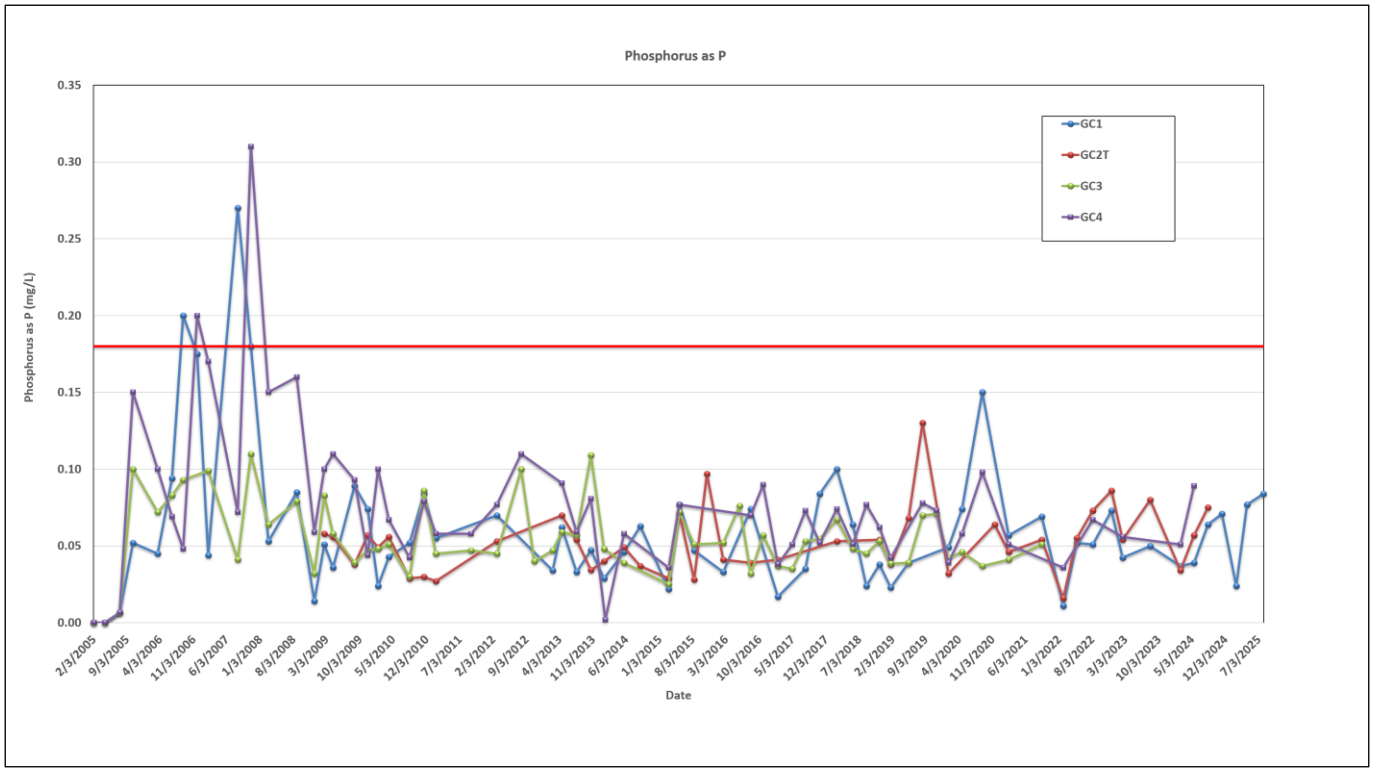


Figure 3. Total Phosphorus results for Gum Creek.

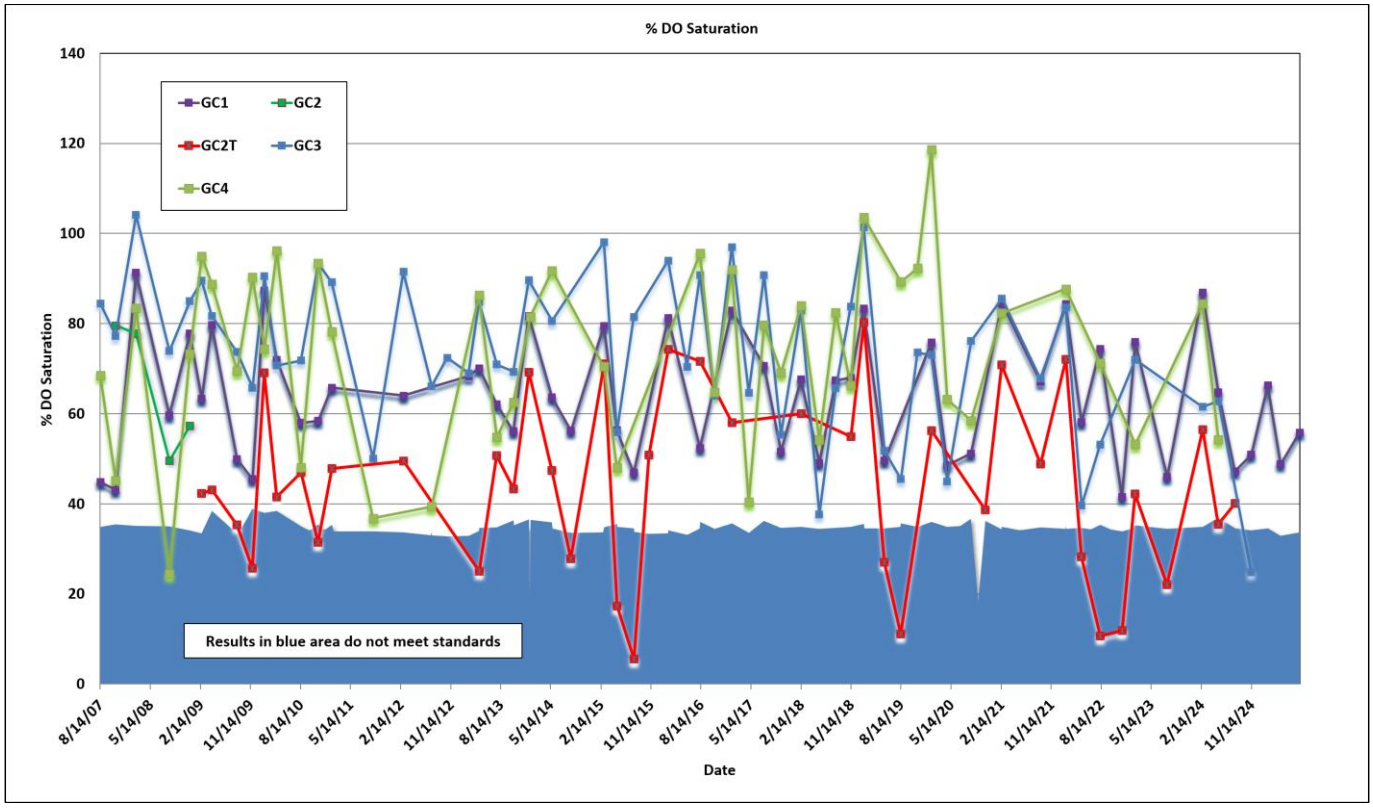


Figure 4. Dissolved Oxygen Percent Saturation results for Gum Creek.

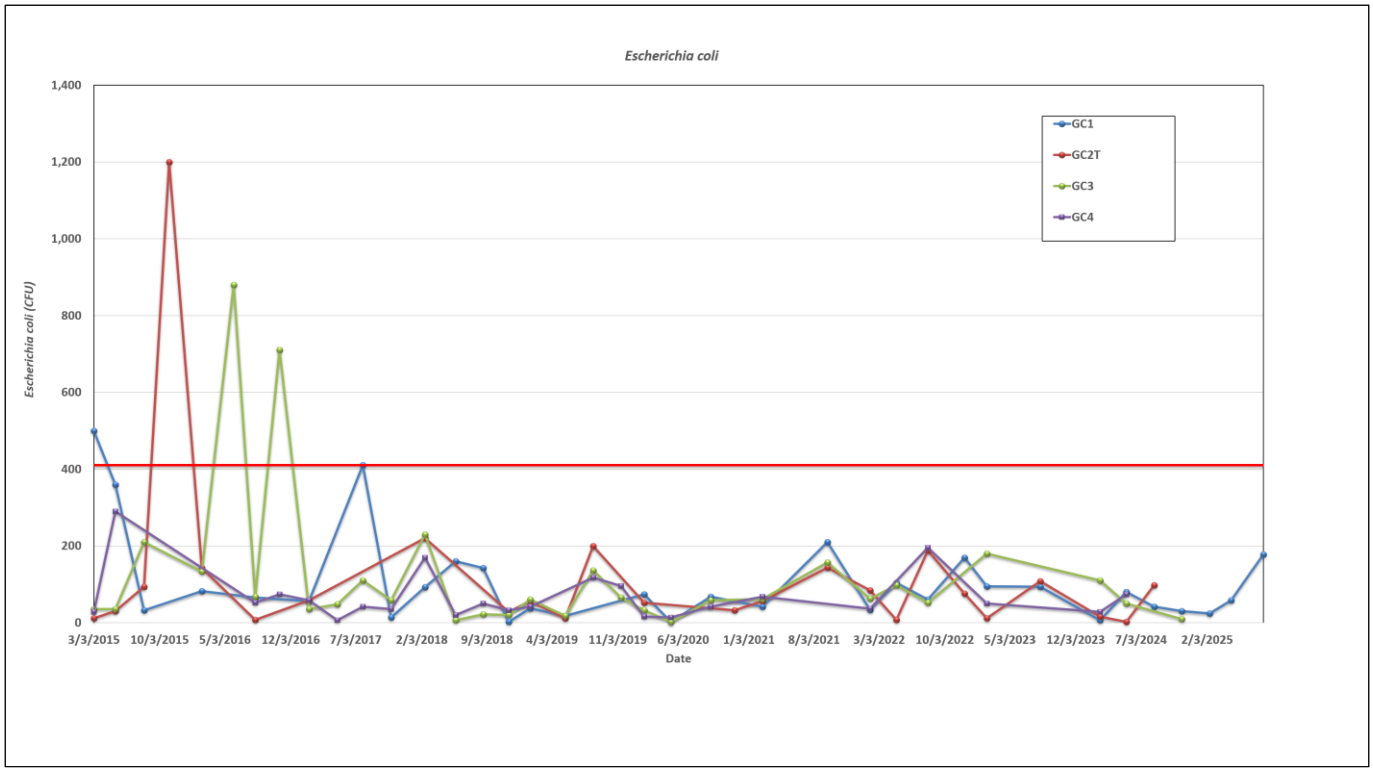
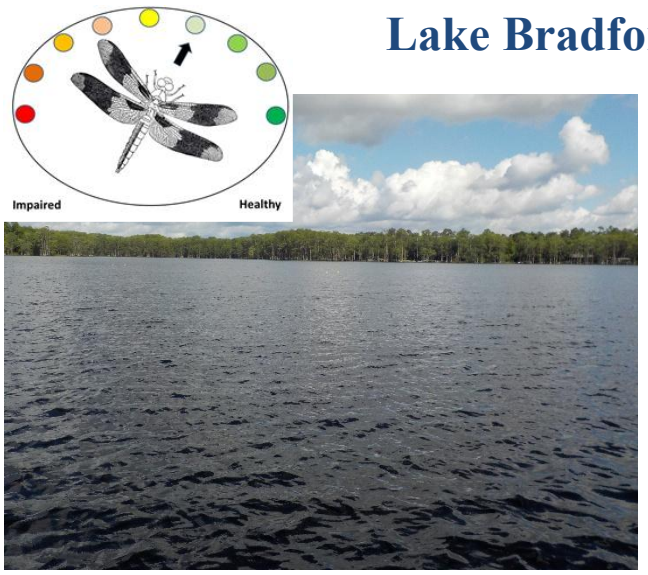


Figure 5. *Escherichia coli* results for Gum Creek.

Lake Bradford EcoSummary



Located in western Leon County, the Bradford Brook Chain of Lakes is composed of the cypress rimmed, dark water Lakes Bradford (179 acres), Hiawatha (51 acres) and Cascade (124 acres). Water typically flows east via Bradford Brook into Lake Cascade. Lake Hiawatha receives flow from Lake Cascade via a culvert beneath Capital Circle Southwest. Much of the water entering Lake Bradford is via Lake Hiawatha, though at times Grassy Lake flows into Lake Bradford. On occasion, flow is reversed and Lake Bradford flows into Lake Hiawatha which then flows into Lake Cascade. In addition, groundwater sources of flow are possible.

Approximately 31% of the runoff flowing into the Bradford Brook Chain of Lakes comes from developed land uses such as rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

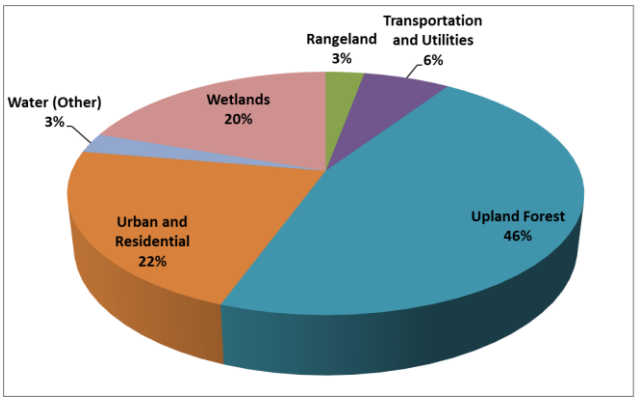


Figure 1. Lake Bradford watershed land use.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow) and sediment samples are collected annually. Leon County also conducts an annual vegetation survey to evaluate the health of floral (plant) communities in the County lakes. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to

determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Water quality results and thresholds are found in **Table 1**. Since 2004, there have been no exceedances in the NNC.

Table 1. NNC thresholds and sample results for Lake Bradford.

Colored Lake	Chlorophyll-a 20 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	3.0	0.34	0.01
2005	3.0	0.35	0.02
2006	2.0	0.46	0.02
2007	3.3	0.68	0.03
2008	10.1	0.75	0.03
2009	3.4	0.64	0.03
2010	4.4	0.61	0.03
2011	10.0	0.83	0.05
2012	12.7	0.59	0.03
2013	13.0	0.67	0.02
2014	2.1	0.69	0.02
2015	6.4	0.64	0.03
2016	6.2	0.63	0.02
2017	4.0	0.67	0.02
2018	7.1	0.71	0.03
2019	3.3	0.50	0.02
2020*	-	-	-
2021	1.4	0.50	0.01
2022	3.2	0.54	0.02
2023	2.4	0.52	0.03
2024	2.5	0.80	0.02
2025	4.4	0.60	0.02

* Due to access restrictions associated with the COVID-19 pandemic, staff could not access the lake during the 2nd quarter of 2020 and thus could not determine the NNC for 2020.

Metals

Lead (1.20 µg/L) exceeded Class III water quality standards during the 4th quarter of 2025. Relict anthropogenic sources such as leaded gasoline are most likely to be the cause of lead exceedances.

Click here for more information on metal levels in Leon County waterbodies.

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Bradford due to elevated levels of mercury.

Click here for more information about fish consumption advisories.

Floral Assessment

The Lake Vegetation Index (LVI) score for Lake Bradford was 79, placing the lake's vegetative community in the Exceptional category.

Twenty plant species were found during the survey. The native species, pond cypress (*Taxodium ascendens*), and maidencane (*Panicum hemitomon*), were the most dominant species. Other species include swamp titi (*Cyrilla racemiflora*), and buttonbush (*Cephalanthus occidentalis*).

Unfortunately, several species of non-native exotic plants were found in Lake Bradford and are a concern for the future health of the lake. The Florida Exotic Invasive Species Council considers torpedo grass (*Panicum repens*) a Category I Invasive Exotic. Water spangles (*Salvinia minima*) is another exotic found in the lake. For additional information about Category I invasive exotic plants, please go to the Florida Exotic Invasive Species Council: https://www.floridainvasives.org/

Click here for more information on the Lake Bradford LVI.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling results, Lake Bradford continued to meet the nutrient requirements. Lead exceeded Class III water quality standards during the 4th quarter of 2025. Relict anthropogenic sources such as leaded gasoline are most likely to be the cause of lead exceedances. The LVI score for Lake Bradford placed the lake's vegetative community in the Exceptional category.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site B0B.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Lake Cascade EcoSummary



Located in western Leon County, the Bradford Brook Chain of Lakes is composed of the cypress rimmed Lakes Bradford (179 acres), Hiawatha (51 acres) and Cascade (124 acres). Water typically flows east via Bradford Brook into Lake Cascade. Lake Hiawatha receives flow from Lake Cascade via a culvert beneath Capital Circle Southwest. Much of the water entering Lake Bradford is via Lake Hiawatha, though at times Grassy Lake flows into Lake Bradford. On occasion, flow is reversed and Lake Bradford flows into Lake Hiawatha which then flows into Lake Cascade. In addition, groundwater sources of flow are possible.

Approximately 32% of land uses in the 16,591-acre Lake Cascade watershed comes from agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals.

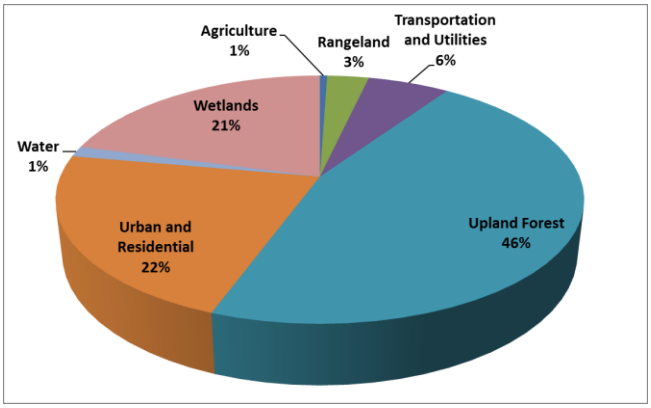


Figure 1. Lake Cascade watershed land use.

State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

For years, many people have thought that an active sinkhole exists in Cascade Lake; however, despite numerous efforts, a sinkhole has not been found. The lake's sandy bottom is permeable and has a high filtration rate, especially when compared to Lakes Hiawatha and Bradford. It is probable that the bottom is more permeable in certain areas than others, but at this time there is no one area than can truly be called a sinkhole. Due to fluctuating water levels, sampling continues to be intermittent, and results remain somewhat inconclusive.

Methods

Surface water samples are collected quarterly (as field conditions allow). Normally Leon County conducts an annual vegetation survey to evaluate

the health of floral (plant) communities in the County lakes. Since 2022, low water levels have prevented floral assessments.

This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

The nutrient thresholds and results are found in **Table 1**. When data requirements were met, nutrient values did not exceed the state criteria.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 1-3**). With few exceptions, individual values did not exceed the in-lake criteria.

While the geometric means for the NNC parameters were never exceeded, individual values occasionally rose above the threshold values. There was a large increase in Total Nitrogen and Phosphorus in 2013 (4th and 1st quarters, respectively) and a smaller increase in phosphorus levels during the 1st quarter of 2018. Increased levels of nutrients could be attributed to the decay of terrestrial plants that grew in the lake bottom during drought conditions or possibly stormwater runoff associated with the southwest Capital Circle widening. Post nutrient levels have decreased. The chlorophyll-a value for the 1st quarter of 2019 (55.2 µg/L) is by far the highest chlorophyll-a value recorded on Lake Cascade. Other water quality parameters taken during that time frame did not suggest an algal bloom or nutrient problem, so it is unknown why the chlorophyll-a value was so elevated.

Table 1. NNC thresholds and results for Lake Cascade.

Colored Lake	Chlorophyll-a 20 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	2.8	0.21	0.01
2005	2.4	0.43	0.01
2006	3.6	0.38	0.01
2007-2012*	-	-	-
2013	4.7	1.06	0.02
2014	3.9	0.79	0.02
2015*	-	-	-
2016	3.2	0.76	0.01
2017	2.4	0.83	0.01
2018-2025*	-	-	-

* Due to low water conditions, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

Metals

Lead (1.20 µg/L) exceeded Class III water quality standards during the 1st quarter of 2025. Relict anthropogenic sources such as leaded gasoline are most likely to be the cause of lead exceedances.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Cascade continued to meet the nutrient thresholds for the East Panhandle Region. Lead exceeded Class III water quality standards during the 1st quarter of 2025. Relict anthropogenic sources such as leaded gasoline are most likely to be the cause of lead exceedances. No other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site B0C.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

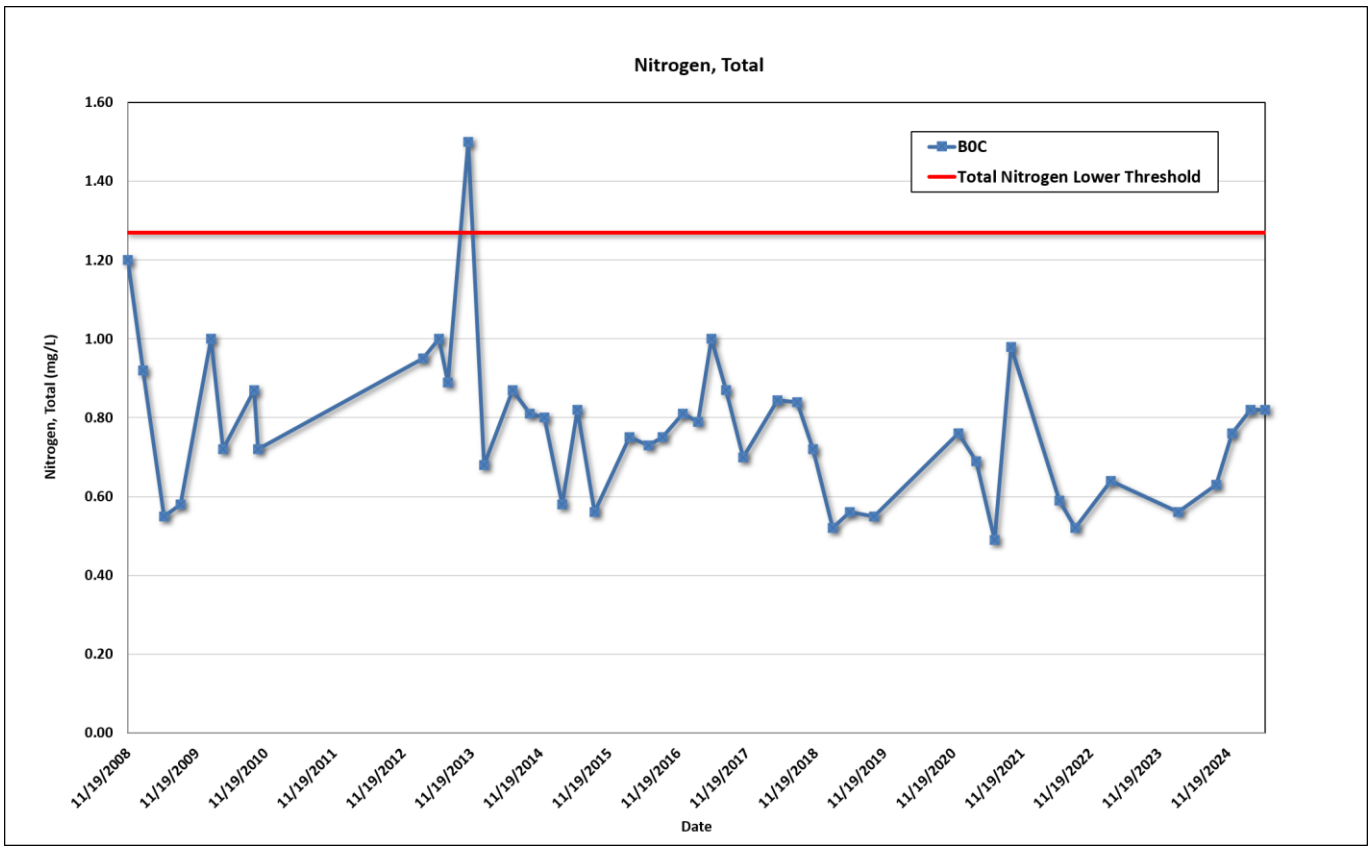


Figure 1. Total Nitrogen results for Lake Cascade.

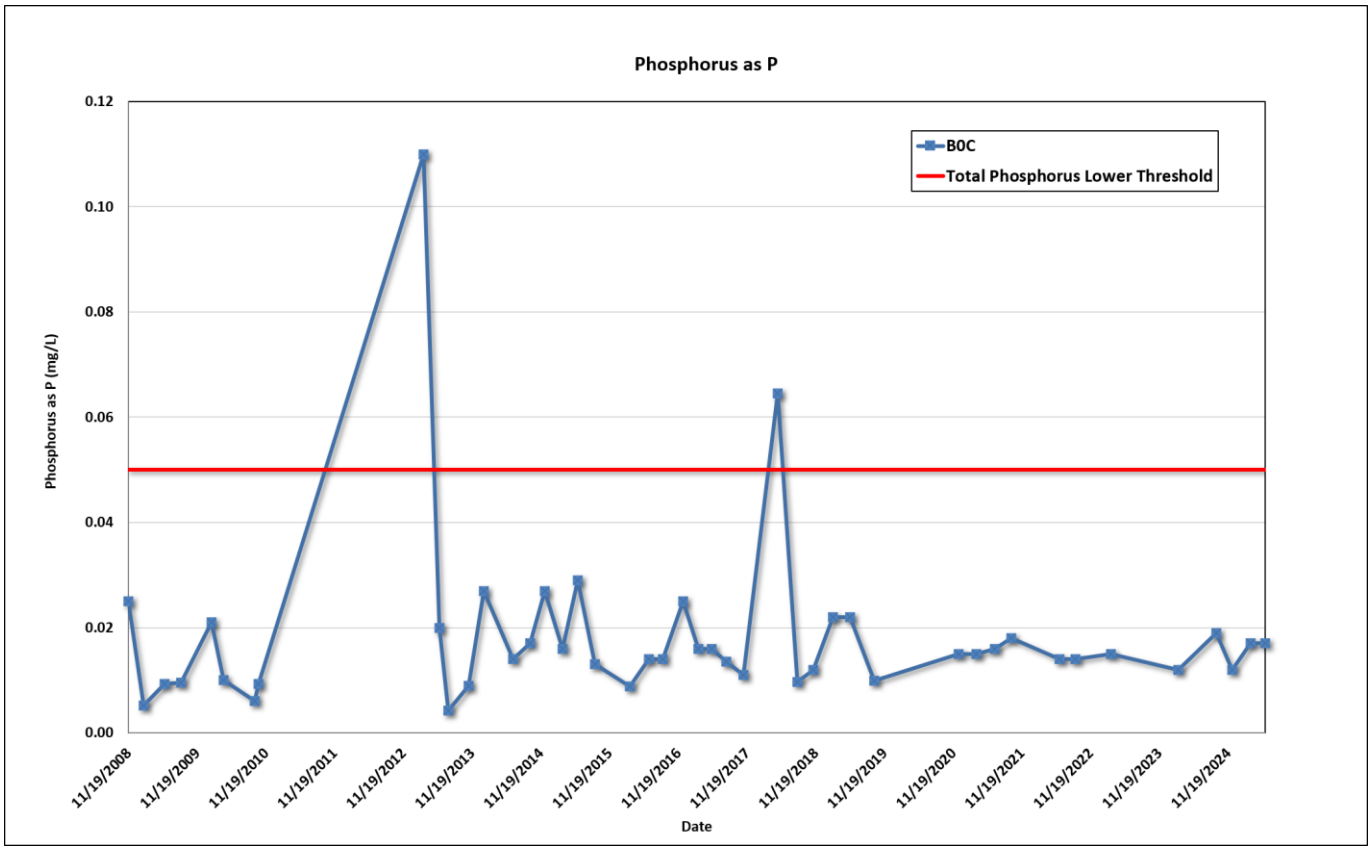


Figure 2. Total Phosphorus results for Lake Cascade.

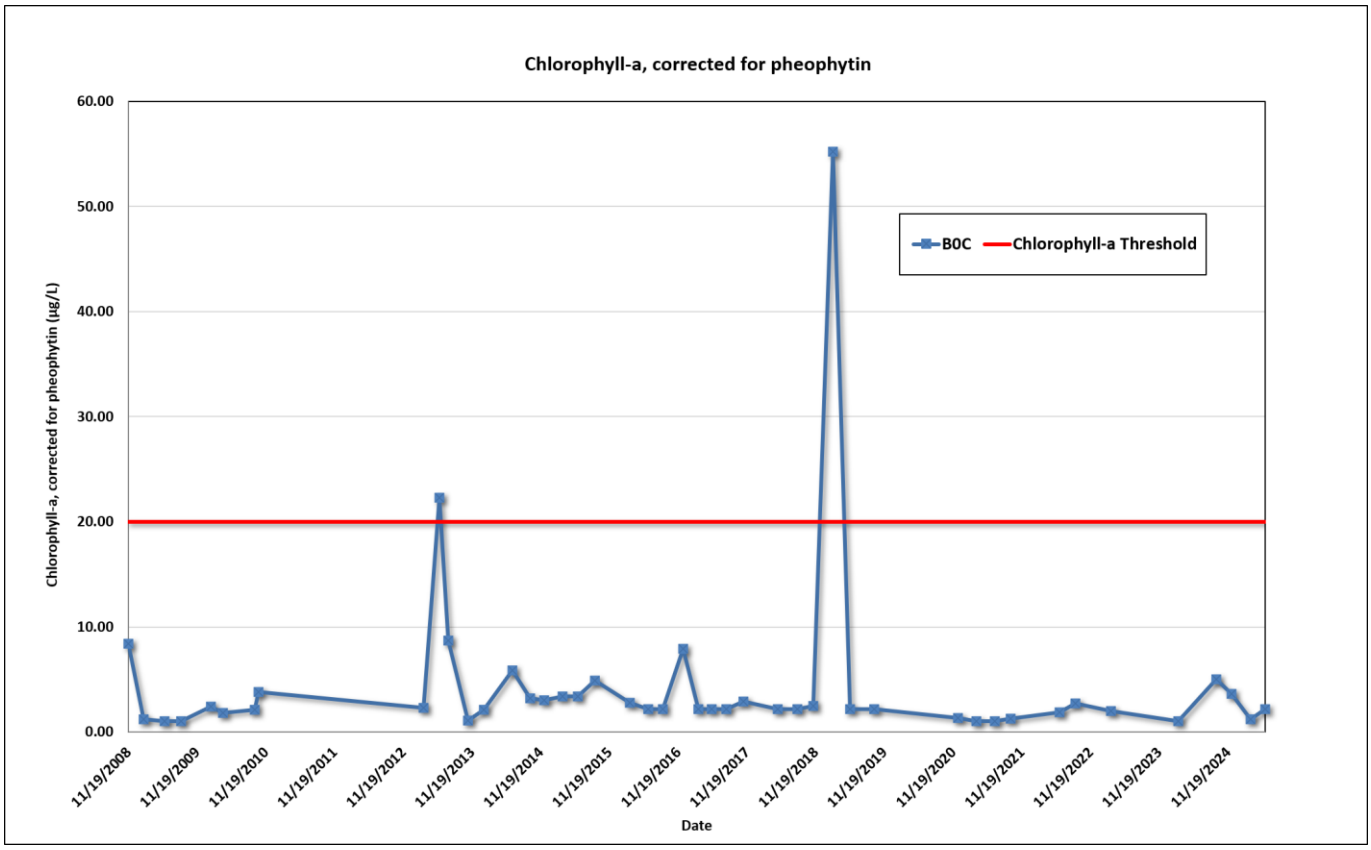
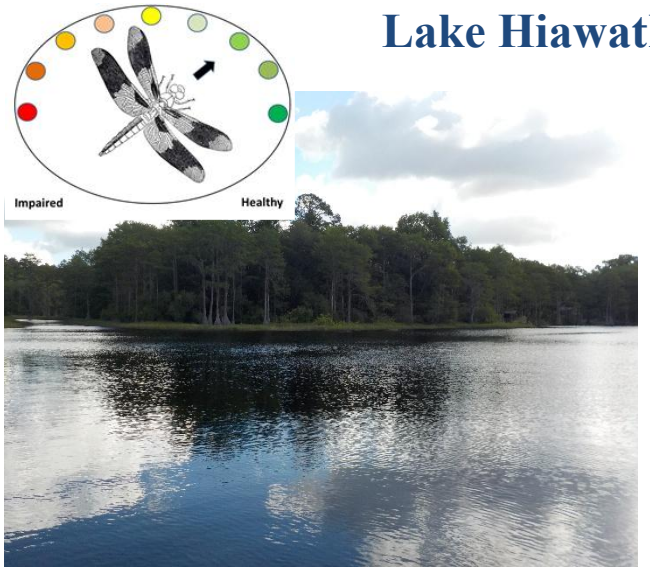


Figure 3. Chlorophyll-a results for Lake Cascade.

Lake Hiawatha EcoSummary



Located in western Leon County, the Bradford Brook Chain of Lakes is composed of the cypress rimmed, dark water Lakes Bradford (179 acres), Hiawatha (51 acres) and Cascade (124 acres). Water typically flows east via Bradford Brook into Lake Cascade. Lake Hiawatha receives flow from Lake Cascade via a culvert beneath Capital Circle Southwest. Much of the water entering Lake Bradford is via Lake Hiawatha, though at times Grassy Lake flows into Lake Bradford. On occasion, flow is reversed and Lake Bradford flows into Lake Hiawatha which then flows into Lake Cascade. In addition, groundwater sources of flow are possible.

Approximately 32% of land uses in the 17,023-acre Lake Hiawatha watershed comes from agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation. Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

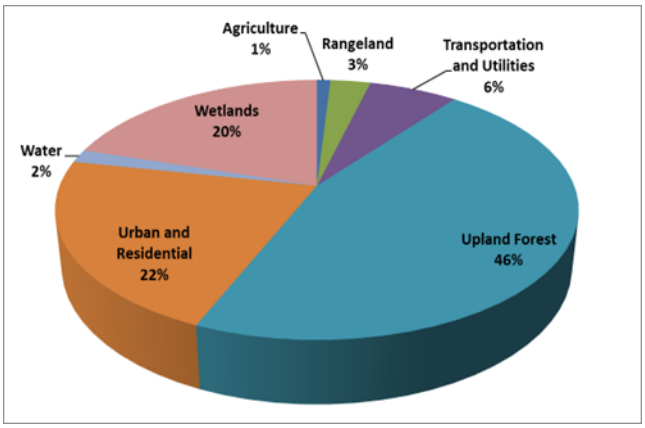


Figure 1. Lake Hiawatha watershed land use.

Methods

Surface water samples are collected quarterly (as field conditions allow) and sediment samples are collected annually. Leon County also conducts an annual vegetation survey to evaluate the health of floral (plant) communities in the County lakes. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in

waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

The nutrient thresholds and results are found in **Table 1**. Low water levels in the 4th quarter of 2025 prevented samples from being collected during the quarter. When data requirements were met, nutrient values did not exceed the state criteria. However, nitrogen values in some years have more than doubled since 2004.

Floral Assessment

The Lake Vegetation Index score for Lake Hiawatha was 78, placing the lake's vegetative community in the upper range of the healthy category.

Nineteen species were found during the survey. The native species pond cypress (*Taxodium ascendens*) and maidencane (*Panicum hemitomon*) were the most dominant species in the lake. Other native shoreline vegetation included red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*), and dahoon holly (*Ilex cassine*).

Unfortunately, the non-native exotic plant water spangles (Salvinia minima) was found in Lake Hiawatha and is a source of concern for the future health of the lake. For additional information about invasive exotic plants, please go to the Florida Exotic Invasive Species Council: https://www.floridainvasives.org/.

Table 1. NNC thresholds and sample results for Lake Hiawatha.

Colored Lake	Chlorophyll-a 20 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	1.6	0.33	0.01
2005	3.4	0.37	0.01
2006	1.9	0.47	0.01
2007	2.4	0.63	0.02
2008*	-	-	-
2009	1.9	0.76	0.02
2010	3.2	0.60	0.02
2011-2013*	-	-	-
2014	1.5	0.67	0.01
2015	3.5	0.68	0.01
2016	2.7	0.74	0.01
2017	2.8	0.72	0.02
2018	2.7	0.70	0.02
2019	2.7	0.52	0.02
2020*	-	-	-
2021	1.5	0.66	0.02
2022	2.7	0.81	0.01
2023*	-	-	-
2024	2.3	0.87	0.02
2025*	-	-	-

* Due to low water conditions or access restrictions associated with the COVID-19 pandemic, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

Click here for more information on the Lake Hiawatha LVI.

Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Hiawatha continued to meet the NNC. The more than doubling of nitrogen values over the sampling period in the last several years continue to be a concern. The 2025 LVI score placed the lake's vegetative community in the healthy category.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

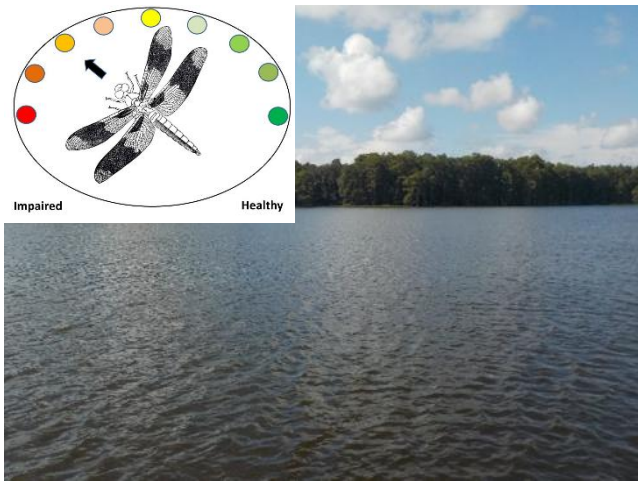
www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site B0H.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Lake Munson EcoSummary



Lake Munson is an approximately 288-acre, cypress-rimmed, nitrogen-limited lake located south of the City of Tallahassee. The lake is believed to have originally been a cypress swamp but has since been impounded and now functions as a shallow man-made lake. Lake Munson receives much of its water from the heavily altered Munson Slough and its tributaries. Lake outflow continues southward via Munson Slough and finally drains into Ames Sink. Dye trace studies have confirmed a direct connection between Ames Sink and Wakulla Springs.

The lake has a history of severe water quality and ecological problems including fish kills, algal blooms, exotic vegetation and snails, high nutrient and bacterial levels, low game fish productivity, sediment contamination, and depressed oxygen levels.

Approximately 54% of land use in the 38,790-acre Lake Munson basin is rangeland, transportation, utilities, urban or residential (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

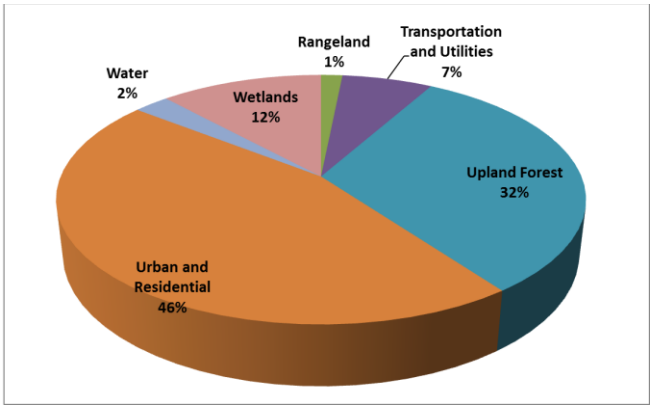


Figure 1. Lake Munson watershed land use.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff, adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as conditions allow), and sediment samples are collected annually. Leon County also conducts an annual vegetation survey to evaluate the health of floral (plant) communities in the County lakes. This information is used to evaluate the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Total Maximum Daily Load (TMDL)

Lake Munson is verified as impaired for nutrients, dissolved oxygen (linked to nutrients and five-day biological oxygen demand), and turbidity. The

lake received a TMDL by FDEP in 2013. The TMDL targeted concentrations and reductions necessary to improve the DO including BOD_5 of 2.00 mg/L, total nitrogen (TN) of 0.765 mg/L, total phosphorus (TP) of 0.44 mg/L, and turbidity of 31 NTU.

Lake Sediments and Drawdowns

Organic and nutrient-rich sediments in Lake Munson may be negatively impacting the water quality in the lake. At one time, it was thought that sediment removal was the best way to improve the lake's water quality. Since then, technologies and management techniques continue to change and evolve as new and better information becomes available. Sediment removal in Lake Munson is now known to pose more risk than benefit and would be ecologically harmful and logistically very difficult. Alternatively, periodic, and routine drawdowns are a proven, natural mitigation method that mimic the natural drying and refilling cycle of a lake. Drawdowns are expected to result in de-watering, compaction, and partial oxidation of sediments thus creating a sediment "cap", improving water quality and simultaneously generating suitable habitat for fish spawning.

To ensure the long-term health of Lake Munson, Leon County has conducted two drawdowns. On April 27, 2010, the Leon County Board of County Commissioners directed staff to implement a drawdown as recommended by the Leon County Science Advisory Committee (SAC). The drawdown began on October 18, 2010, and continued until June 14, 2011. Leon County conducted another drawdown in coordination with the State of Florida beginning November 1, 2022, originally anticipated to end Spring 2023, but extended to May 17, 2024. The latest drawdown, a new Invasive Exotic Vegetation Management Program, future reoccurring drawdowns every 5-10 years, and more, are included in the County's ongoing and long-term Action Plan to protect and preserve Lake Munson both now and into the future.

Results

Due to the drawdown and an oftentimes dry lake bottom throughout 2023 and the early part of 2024, no water quality samples were collected in Lake Munson in 2023 and the first quarter of 2024. Water quality sampling in Lake Munson resumed in May 2024.

Nutrients

The nutrient thresholds and results are found in **Table 1**. There have been several instances where nutrient and chlorophyll-a values exceeded the state criteria.

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Geometric means of chlorophyll-a, total nitrogen, and total phosphorus exceeded the state criteria several times over the sampling period. The geometric mean for chlorophyll-a in 2013 (85.0 µg/L) was the highest reading on record. However, starting in 2017 there was a substantial drop in chlorophyll-a values. While total phosphorus values still exceeded the NNC values in 2017 and 2019, total phosphorus, total nitrogen, and chlorophyll-a values continue to drop over time. The 2020 and 2021 phosphorus and nitrogen NNC results are among the lowest levels recorded by Leon County staff. Total phosphorus values slightly exceeded the NNC in 2025. As the refilled lake continues to stabilize, staff believe

that a combination of upstream nutrient reduction and the re-establishment of aquatic vegetation will contribute to the eventual reduction of chlorophyll-a and water column nutrients.

As shown in **Figures 2 - 6**, past levels of BOD, total nitrogen, total phosphorus, and turbidity were consistently above the TMDL limits, but levels are slowly dropping. Algal blooms, represented by chlorophyll-a (**Figure 6**), continue to be a problem in Lake Munson, but values continue to drop.

Fish Consumption Advisory

The Florida Department of Health (FDOH) has issued consumption limit advisories for certain fish in Lake Munson due to elevated levels of mercury.

Click here for more information about fish consumption advisories.

Previous advisories have included consumption limits for polychlorinated biphenyls (PCBs); however, in 2019 state agencies collected fish tissue samples and in 2021 FDOH determined that PCB levels in fish tissues were at very low levels and that the current mercury advisories would be protective of human health.

Metals

Station LMU8 exceeded water quality criteria for iron during the 3rd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Table 1. NNC thresholds and results for Lake Munson. Results in bold signify exceedances of the State criteria.

Clear Lakes, High Alkalinity	Chlorophyll - a 20 µg/L	TN Threshold 1.05-1.91 mg/L	TP Threshold 0.03-0.09 mg/L
2004	3.6	0.35	0.06
2005	13.8	0.62	**0.11**
2006	12.4	1.38	**0.19**
2007	10.9	1.49	**0.30**
2008	13.1	0.76	**0.20**
2009	5.5	0.88	**0.17**
2010	8.7	1.07	**0.16**
2011*	-	-	-
2012	**39.0**	**1.08**	**0.18**
2013	**85.0**	**1.51**	**0.24**
2014	13.0	1.27	**0.24**
2015	**25.4**	**1.37**	**0.22**
2016	16.4	0.70	**0.15**
2017	5.8	0.50	**0.11**
2018	6.4	0.60	0.09
2019	7.7	0.52	**0.11**
2020	3.3	0.38	0.05
2021	1.4	0.49	0.06
2022	12.7	0.70	0.09
2023-2024*	-	-	-
2025	10.1	0.70	**0.10**

* Due to low water conditions because of drawdowns, staff could not collect the appropriate number of samples and thus could not determine the NNC for 2011 or 2023-2024.

Floral Assessment

The Lake Vegetation Index score for Lake Munson was 36 placing the lake's vegetative community in the impaired category. This score is an improvement of 2022's score (30), though still a substantial decline from previous year's scores of 43 (2021) and 53 (2020).

Unfortunately, several species of non-native exotic plants continue to be found in Lake Munson and are a concern for the future health of the lake. The Florida Exotic Invasive Species Council considers the aforementioned water hyacinth (*Eichhornia crassipes*), torpedo grass (*Panicum repens*), wild taro, (*Colocasia esculenta*), anglestem primrose willow (*Ludwigia peruviana*), Mexican bluebell (*Ruellia simplex*), and Chinese Tallow (*Sapium sebiferum*), all Category I Invasive Exotics. A previous co-dominant Category I Invasive exotic, hydrilla (*Hydrilla verticillata*) was not found during the survey in 2025.

Alligator weed (*Alternanthera philoxeroides*) and rattlebox (*Sesbania pumiceae*) are two species that are recognized by the Council as Category II Invasive Exotics. Cuban bullrush (*Oxycaryum cubense*) is another exotic found in the lake. For additional information about Category I and II invasive exotic plants, please go to the Florida Exotic Invasive Species Council: https://www.floridainvasives.org/

Click here for more information on the Lake Munson LVI.

For additional information about the LVI please go to the Florida Department of Environmental Protection webpage: https://floridadep.gov/dear/bioassessment/content/bioassessment-methods#Lakes.

For additional information about exotic Category I and II invasive exotic plants, please go to the Florida Exotic Pest Plant Council: http://www.fleppc.org/list/list.htm.

The FWC's Invasive Plant Management Program can be accessed via the following webpage: https://myfwc.com/wildlifehabitats/habitat/invasive-plants/.

Conclusions

While there was an uptick in nutrient and chlorophyll-a values before the drawdown and immediately after the lake refilled, staff believe that a combination of upstream nutrient reduction and the re-establishment of aquatic vegetation will eventually contribute to the reduction of chlorophyll-a and water column nutrients. Station LMU8 exceeded water quality criteria for iron during the 3rd quarter of 2025. It appears that iron levels, at least in part, appear to be naturally occurring. While the 2025 LVI score placed the vegetative community into the Impaired category, it is hoped that LVI scores will continue to improve over time as the lake and vegetative community stabilizes. The FDOH has issued consumption limit advisories for certain fish in Lake Munson due to elevated levels of mercury.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites LMU7 and LMU8.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

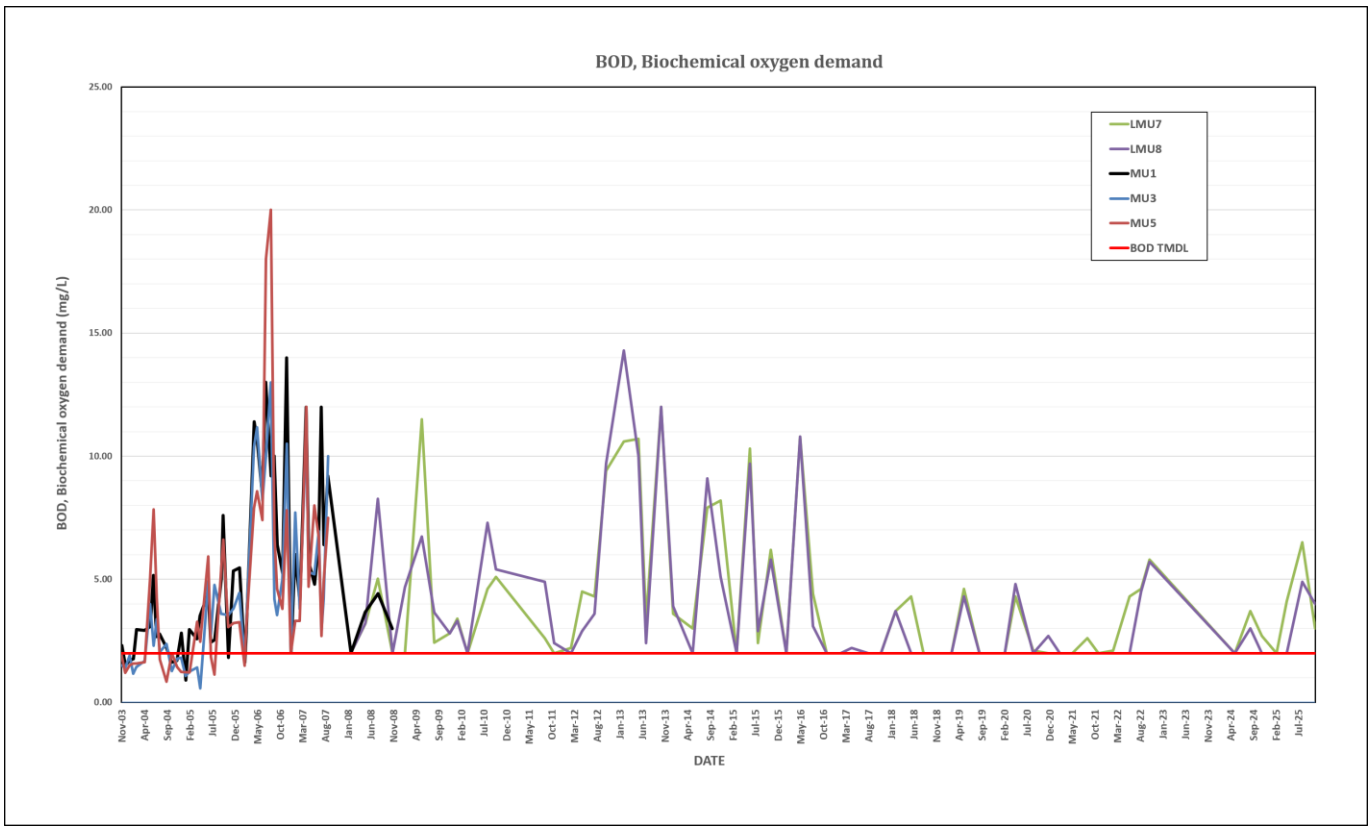


Figure 2. BOD results for Lake Munson.

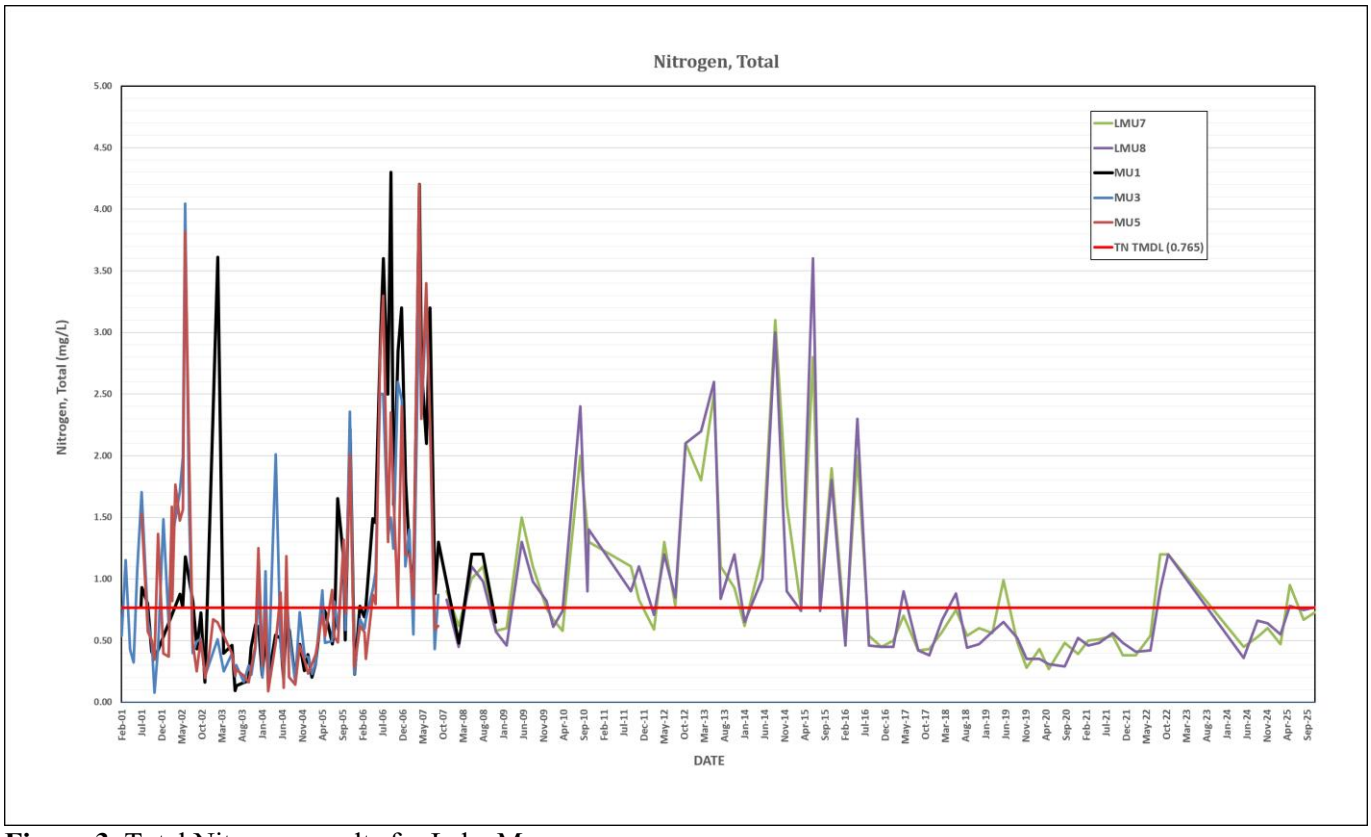


Figure 3. Total Nitrogen results for Lake Munson.

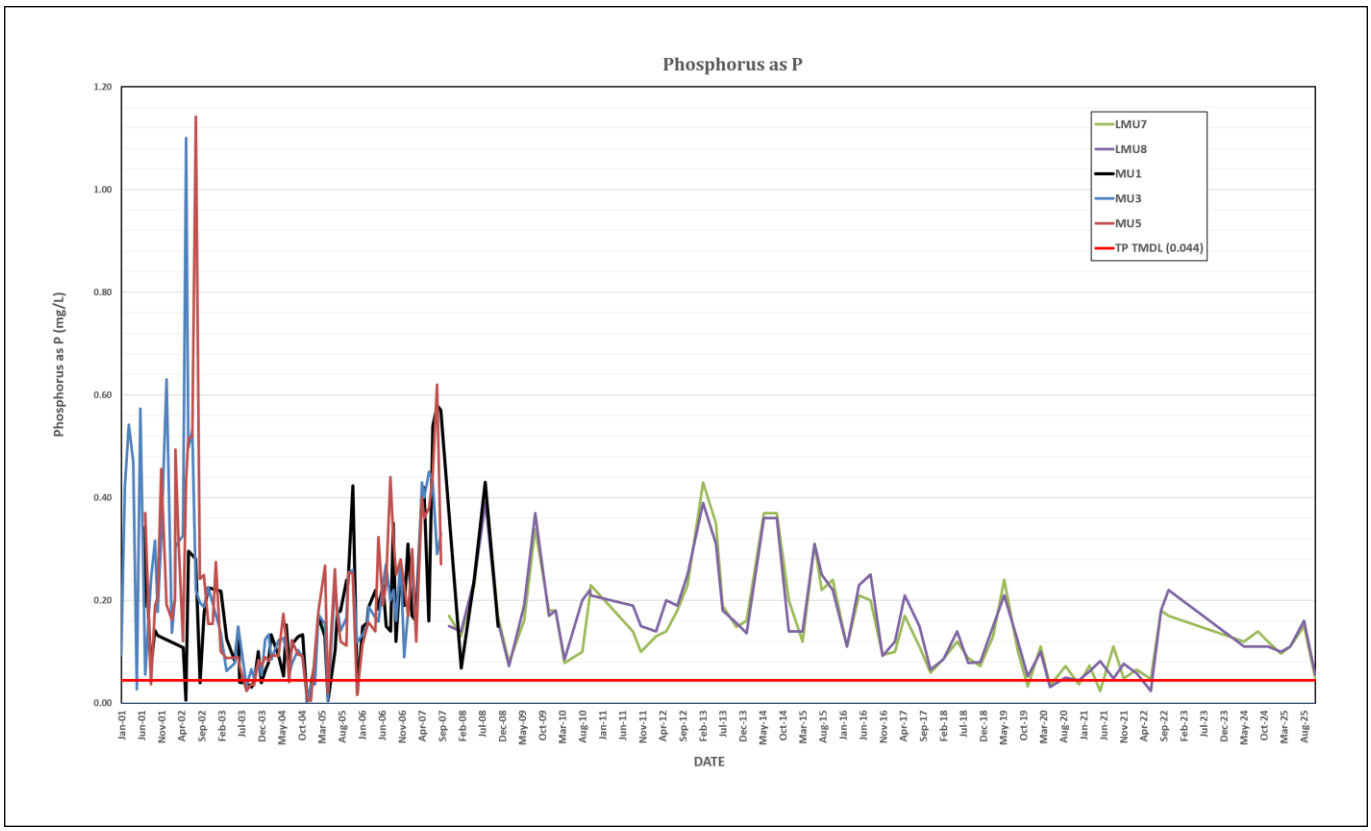


Figure 4. Total Phosphorus results for Lake Munson.

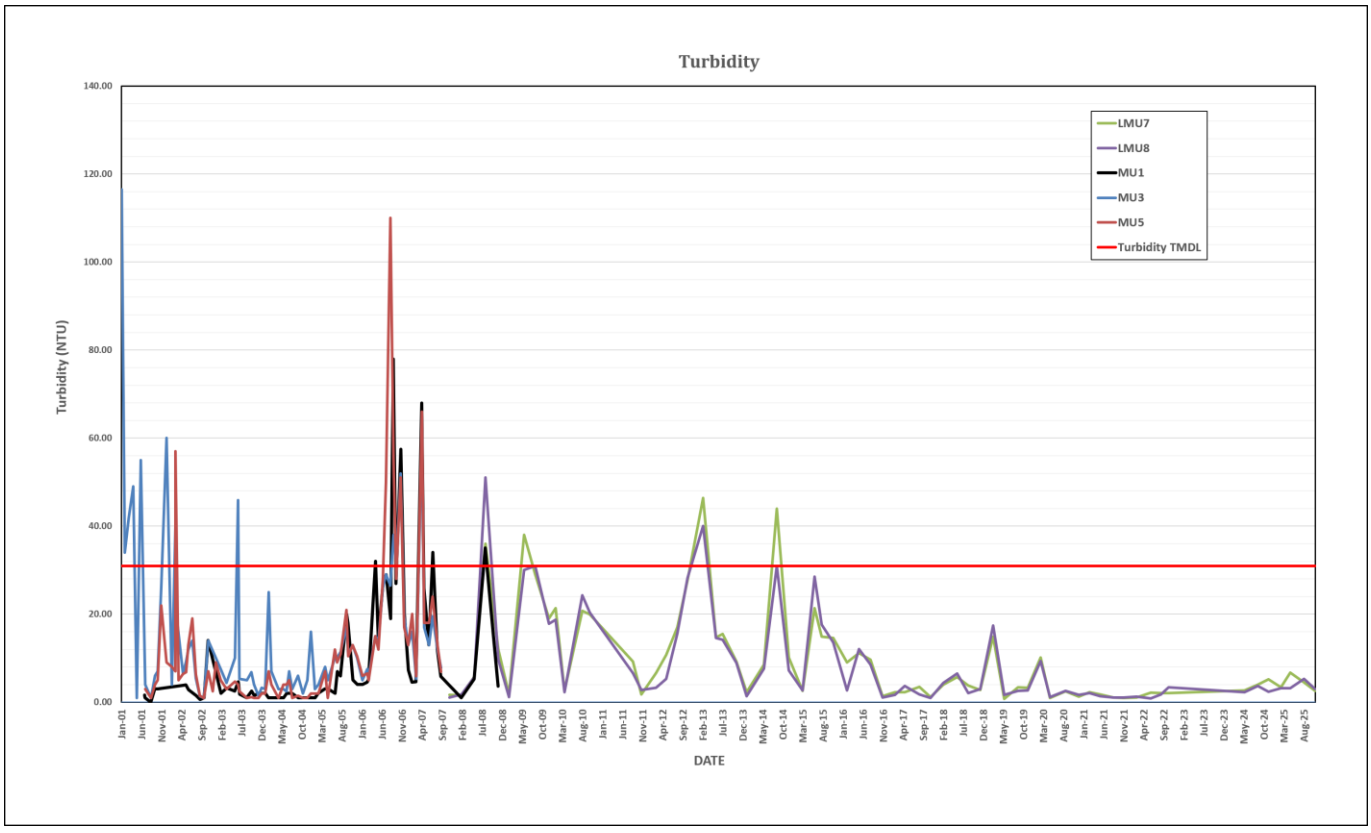


Figure 5. Turbidity results for Lake Munson.

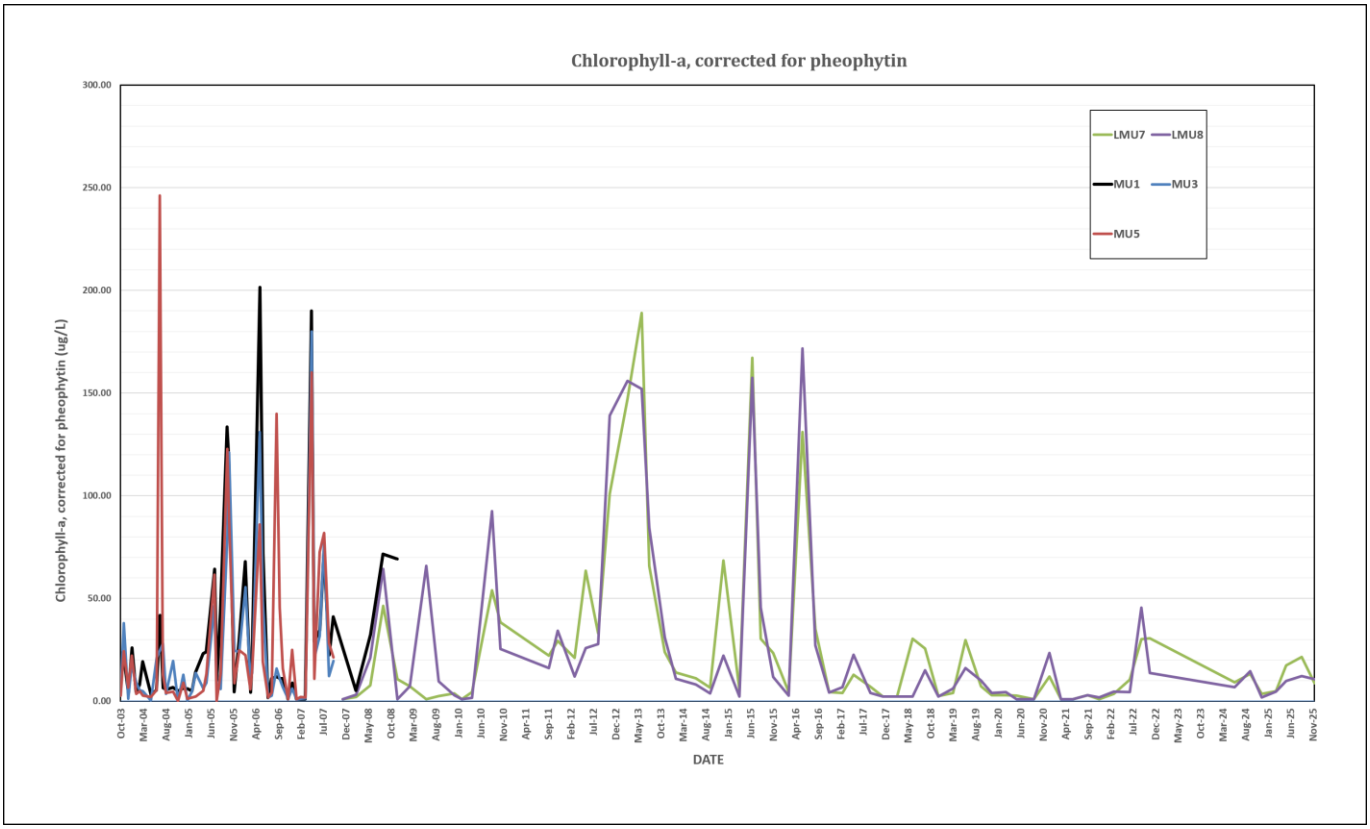
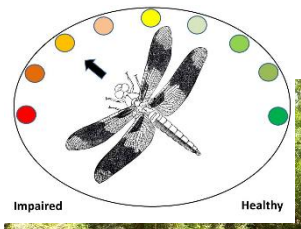


Figure 6. Chlorophyll-a results for Lake Munson.

Munson Slough EcoSummary



The heavily urbanized Munson Slough and its tributaries are located in central Leon County and drain a portion of the City of Tallahassee. The Slough flows south into and out of Lake Munson, then continues to Eight Mile Pond. After exiting Eight Mile Pond, the Slough flows under Oak Ridge Road and enters Ames Sink, which is known to be connected to Wakulla Springs.

Approximately 54% of land use in the 38,790-acre basin is residential, commercial, industrial or transportation (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

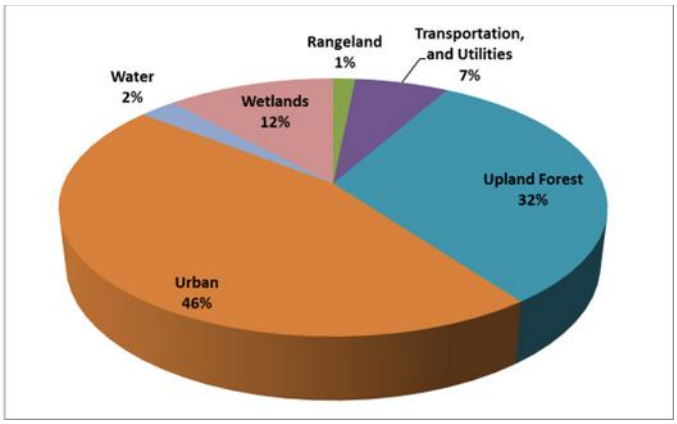


Figure 1. Munson Slough watershed land use.

Total Maximum Daily Loads (TMDLs)

The Florida Department of Environmental Protection (FDEP) issued several TMDLs for Munson Slough, including upstream and downstream of Lake Munson, between 2008 and 2013. The TMDLs are as follows:

TMDLs upstream of Lake Munson

Munson Slough upstream of the lake was verified as impaired for dissolved oxygen (DO), linked to nutrients and five-day biological oxygen demand (BOD_5), as well as fecal coliform.

The TMDL established in 2013 targeted concentrations and reductions necessary to improve the DO including BOD_5 of 2.00 mg/L, Total Nitrogen (TN) of 0.72 mg/L, and Total Phosphorus (TP) of 0.15 mg/L.

The 2008 TMDL established target fecal coliform concentrations and reductions; however, the fecal coliform standard in Florida has been supplanted by standards developed for *Escherichia coli*.

Station MS1, located slightly upstream of Lake Munson, is used to determine if the water quality

upstream of Lake Munson meets the TMDL requirements.

TMDLs downstream of Lake Munson

Munson Slough downstream of the lake was verified as impaired for dissolved oxygen (linked to BOD_5) and un-ionized ammonia.

The 2013 TMDL set an in-stream concentration target for BOD_5 of 2.00 mg/L necessary to meet the dissolved oxygen criterion.

The un-ionized ammonia impairment will be addressed by reductions in total ammonia. The 2013 TMDL established an in-stream concentration of 0.32 mg/L necessary to meet the water quality criterion. However, the un-ionized ammonia criterion has been replaced with the Total Ammonia Nitrogen (TAN) criterion.

Stations MS2, MS4, and MS5 all located downstream of Lake Munson, are used to determine if the water quality downstream of Lake Munson meets the TMDL requirements.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to evaluate the health of Munson Slough and meets the requirements of FDEP.

Drawdown and Post Drawdown Water Quality Study

To ensure the long-term health of Lake Munson, Leon County conducted a drawdown in coordination with the State of Florida beginning November 1, 2022, originally anticipated to end Spring 2023, but extended to May 17, 2024. The drawdown is part of the County's ongoing and long-term Action Plan to protect and preserve Lake Munson both now and into the future.

The Action Plan includes Enhanced Monitoring which provides information on the lake's response to the drawdown and implementation of the lake management strategies in the years following. In conjunction with the drawdown extension, the Board approved a Drawdown Water Quality Study. This study included monthly water chemistry sampling in Munson Slough upstream and downstream of the lake, offering valuable data on the system's stability throughout the drawdown. Following conclusion of the drawdown, the Post-Drawdown Water Quality Study began to monitor the lake's response through monthly water chemistry sampling and flow data collection of the water entering and leaving Lake Munson. The samples provide information on the water chemistry concentrations entering and leaving Lake Munson and provide insight into how the lake is reacting during the drawdown. The following results combine the findings of both studies into the regular quarterly sampling results.

Results

During periods of low water conditions, four temporally independent samples per year could not always be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill requirements.

Nutrients

The nutrient thresholds and results are found in **Tables 1 and 2**.

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

The Munson Slough total nitrogen and phosphorus levels occasionally exceeded the NNC during the period of record. However, overall trends suggest that nutrient levels are dropping in the Slough.

Since 2016, all stations have met the NNC for both TN and TP, with the exception MS2 in 2016 and MS4 in 2023, both of which were slightly over the criteria for TP.

Nitrogen levels upstream of the lake at Station MS1 appeared to be decreasing until recently (**Figures 2 and 3**). The recent increase in nutrients appears to be related to upstream maintenance activities, including invasive exotic plant control in the Lake Henrietta stormwater facility and the upstream portion of Munson Slough and erosion control measures occurring further upstream. When plants are treated, nutrients previously stored in the plant's tissues are released into the water as the plants die and decompose. Sediments that are suspended in the water column due to construction and maintenance activities also contributed to increased nutrients in the system.

While the stations downstream of Lake Munson do not have nutrient TMDLs, it is helpful to compare these stations to the upstream MS1 station (**Figures 4 and 5**). During the Lake Munson drawdown, nutrient concentrations leaving the lake were often higher than the concentrations entering the lake, likely the result of the instability of the lake due to the drawdown. Unstable systems can be caused by changes in vegetation in the lakebed or rising and lowering water levels and can result in water quality parameter changes as the water moves through the lake. As the lake and plant community stabilizes in and upstream of the lake, it is anticipated that nutrient concentrations will also stabilize.

Table 1. NNC threshold and Total Nitrogen results for Munson Slough. Results in bold signify exceedances of the NNC.

Munson Slough	**Instream Protection Criteria**				
	TN (1.03 mg/L)				
Year	**MS1**	**MS2**	**MS3**	**MS4**	**MS5**
2006	0.75	**1.44**	**1.32**	**1.43**	-
2007	**1.36**	**1.59**	-	-	-
2008	0.89	0.73	-	-	0.87
2009	0.62	0.73	0.74	-	-
2010	**1.09**	**1.35**	-	**1.35**	**1.14**
2011	0.80	-	-	-	-
2012	0.90	-	-	1.02	-
2013	**1.27**	-	-		
2014	0.97	**1.08**	-	**1.16**	**1.08**
2015	0.81	**1.41**	-	**1.39**	-
2016	-	0.89	-	0.89	-
2017	0.73	-	-	-	-
2018	0.69	0.63	-	0.60	-
2019	-	-	-	-	-
2020	0.51	-	-	-	-
2021-2022	-	-	-	-	-
2023	0.46	0.70	-	0.71	0.40
2024	0.57	0.53	-	0.50	-
2025	0.78	0.85	-	-	-

Since the Munson Slough watershed is heavily urbanized, and the Slough itself has been significantly altered over the years, there are elevated nutrients in this system for several reasons. Urban runoff tends to have high nutrient loads due to fertilizers, lawn clippings, sediments, animal droppings, sewer overflows, etc. As the invasive exotic plant community is reduced via judicious application of herbicides, nutrients previously sequestered in plant biomass are released into the water column during plant decomposition, leading to a temporary increase in nutrient concentrations. Although nutrient levels continue to fluctuate, significant past and ongoing investments in upstream improvements, such as stormwater facilities and Best Management Practices (BMPs), have contributed to an overall reduction in nutrient levels.

Table 2. NNC threshold and Total Phosphorus results for Munson Slough. Results in bold signify exceedances of the NNC.

Munson Slough	Instream Protection Criteria				
	TP (0.18 mg/L)				
Year	MS1	MS2	MS3	MS4	MS5
2006	0.16	**0.24**	**0.19**	**0.22**	-
2007	**0.21**	**0.28**	-	-	-
2008	0.12	**0.25**	-	-	**0.28**
2009	0.11	0.18	0.18	-	-
2010	0.13	0.16	-	0.17	0.18
2011	0.11	-	-	-	-
2012	**0.20**	-	-	0.17	-
2013	0.17	-	-	-	-
2014	0.14	**0.23**	-	**0.23**	**0.21**
2015	0.11	**0.23**	-	**0.23**	-
2016	-	**0.19**	-	0.18	-
2017	0.09	-	-	-	-
2018	0.11	0.09	-	0.08	-
2019	-	-	-	-	-
2020	0.08	-	-	-	-
2021-2022	-	-	-	-	-
2023	0.08	0.17	-	**0.19**	0.14
2024	0.12	0.12	-	0.13	-
2025	0.12	0.14	-	-	-

Biological Oxygen Demand (BOD)

Elevated BOD levels (**Figure 6**) during some sampling events showed that elevated microbiological activity may be contributing to changes in dissolved oxygen (DO). The microbial activity appears to have been stimulated by elevated levels of nitrogen and phosphorus. This became more prevalent during the lake drawdown.

Dissolved Oxygen (DO) and Chlorophyll-a

FDEP's DO criterion shows very few results that did not meet the threshold (**Figure 7**). However, this does not in any way invalidate the TMDL. Algal blooms represented by chlorophyll-a (**Figure 8**) can produce large amounts of oxygen during daylight hours via photosynthesis. Conversely, during nighttime hours, respiration occurs, and algal blooms remove DO from the water, which may lead to little or no oxygen in the water column. The chlorophyll-a result (503 µg/L) from Station MS2 during the February 2013 sampling event is the highest chlorophyll-a value recorded from any Leon County water quality station. Chlorophyll-a levels have been relatively low in recent years.

Total Ammonia Nitrogen (TAN)

The TAN criterion (0.29 mg/L and based on water temperature and pH) was exceeded (0.57 mg/L) during the 2nd quarter of 2015 at Station MS2. No exceedances were noted from 2016-2025.

Escherichia coli

An extremely high result was recorded during the June 2018 sampling event at station MS4. The result, 6,900/100 mL, exceeded the Class III water quality standard (410 in 10% or more samples) and was extremely unusual since other water quality parameters that could be associated with bacterial contamination (e.g., total suspended solids, biological oxygen demand) appeared normal for this site. It is suspected that the result was due to an abnormal event, either related to wildlife, or possibly, a sampling or laboratory error. Aside from the aforementioned result, *E. coli* results continued to meet water quality standards until 2024, where there were three exceedances at station MS1 and one exceedance at station MS2 in 2025 (**Figure 9**). Staff expect that this may be related to wildlife, since there is obvious beaver and bird activity in the area.

Metals

Iron

Station MS4 and MS2 exceeded water quality criteria during the 2nd quarter of 2025 for iron. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil

type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, are naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Conclusions

Nitrogen levels upstream of the lake at Station MS1 appeared to be decreasing until recently. The recent increase in nutrients appears to be related to upstream activities, including invasive exotic vegetation eradication efforts and activities associated with construction upstream of the Lake Henrietta stormwater facility.

During the Lake Munson drawdown, nutrient concentrations leaving the lake were often higher than the concentrations entering the lake, likely the result of the instability of the lake due to the drawdown. As the vegetation community continues to reestablish following lake refill, it is anticipated that nutrient concentrations will slowly stabilize.

Elevated BOD levels during some sampling events suggest that microbial activity appears to have been stimulated by elevated levels of nitrogen and phosphorus.

Station MS4 exceeded water quality criteria for iron during the 2nd quarter of 2025. It appears that iron levels, at least in part, are naturally occurring.

There was one *E. coli* exceedances at station MS2 in 2025. Staff expect that this may be related to wildlife, since there is obvious beaver and bird activity in the area.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites MS1, MS2, MS4 and MS5.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

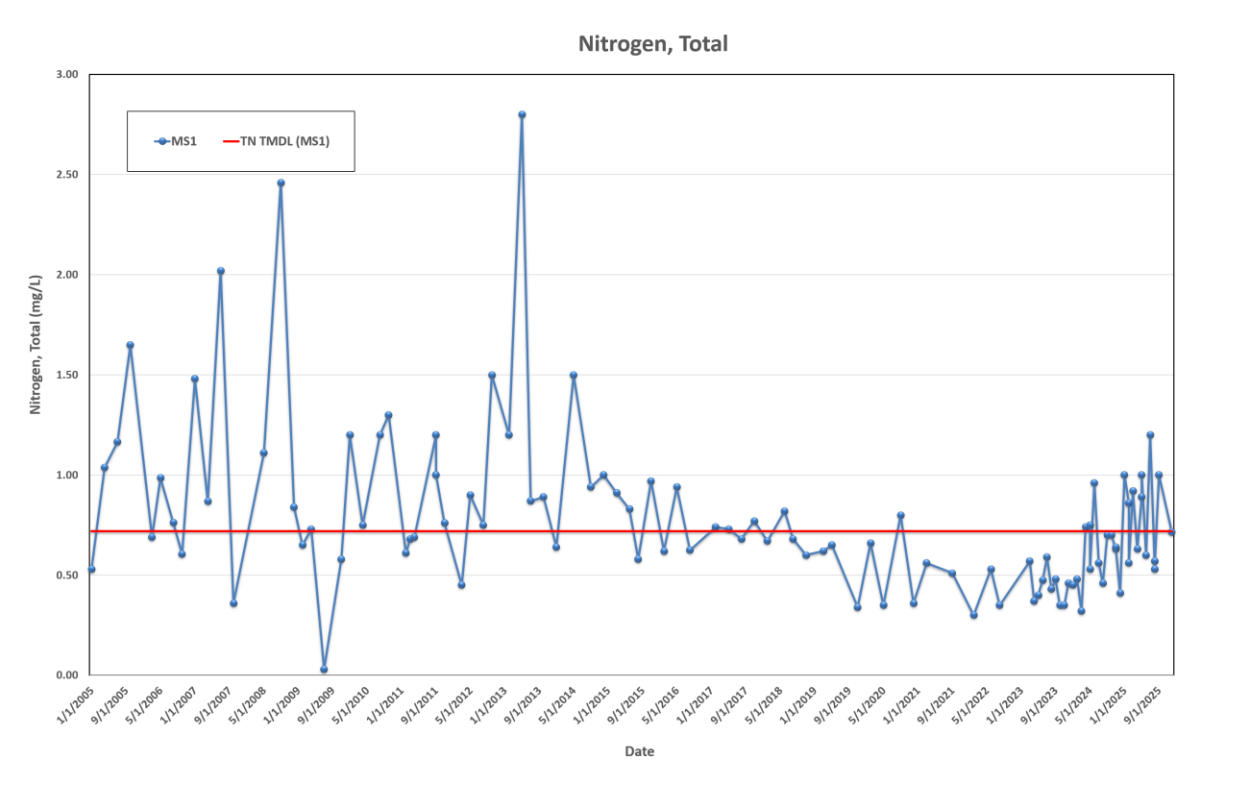


Figure 2. Total Nitrogen results for Munson Slough above the lake (Station MS1).

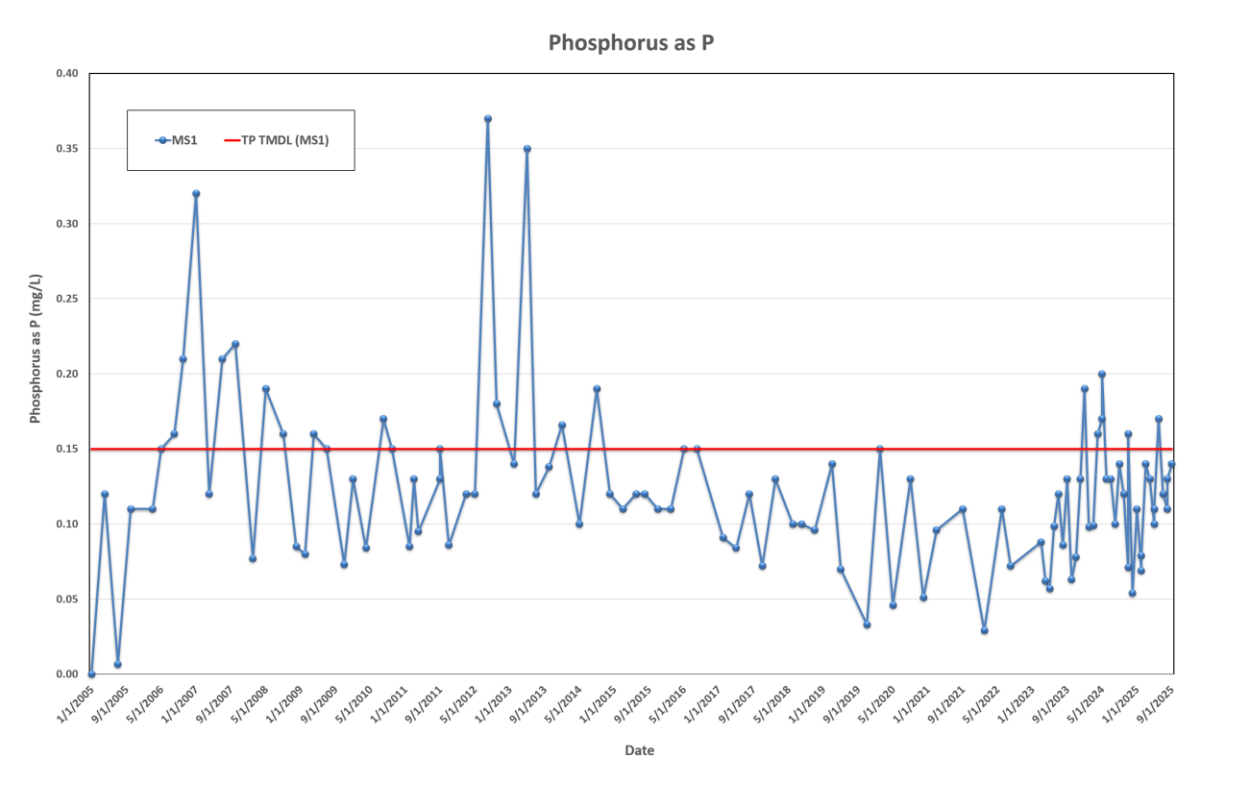


Figure 3. Total Phosphorus results for Munson Slough above the lake (Station MS1).

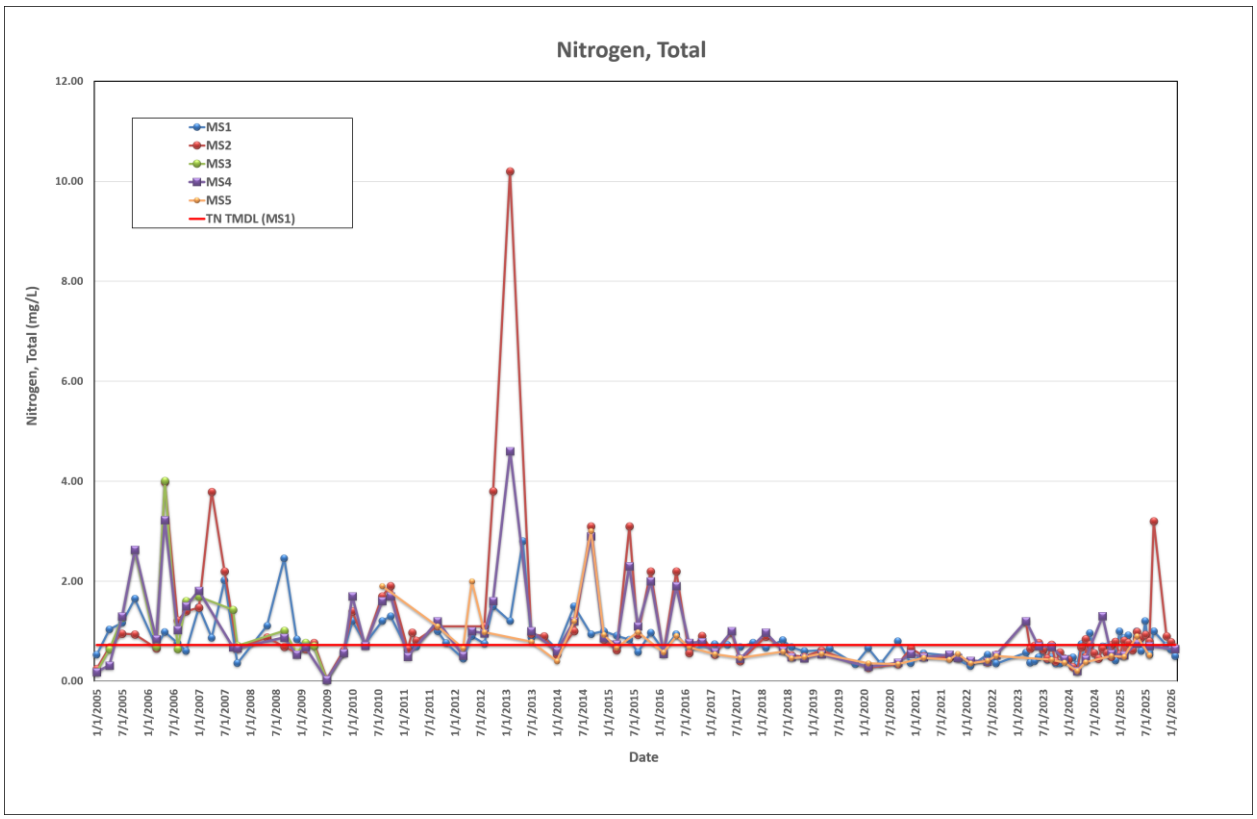


Figure 4. Total Nitrogen results for Munson Slough.

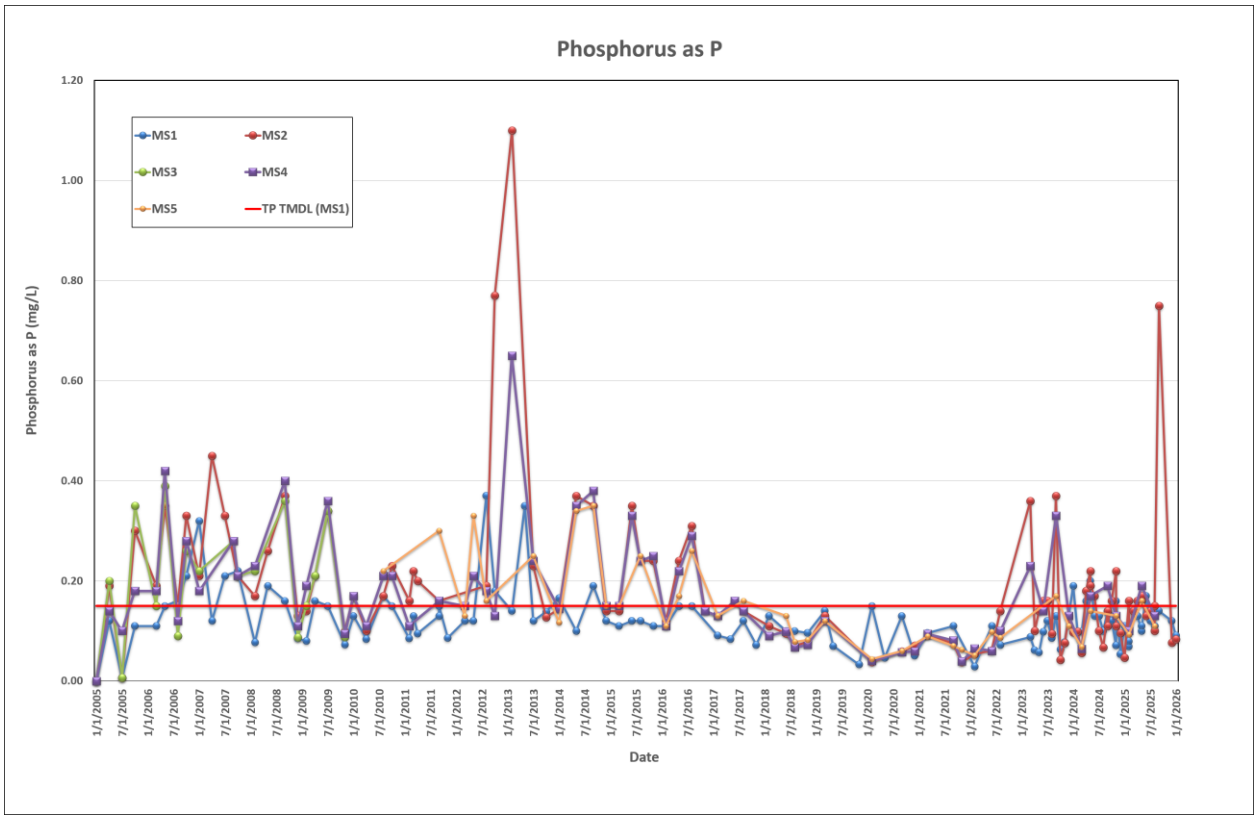


Figure 5. Total Phosphorus results for Munson Slough.

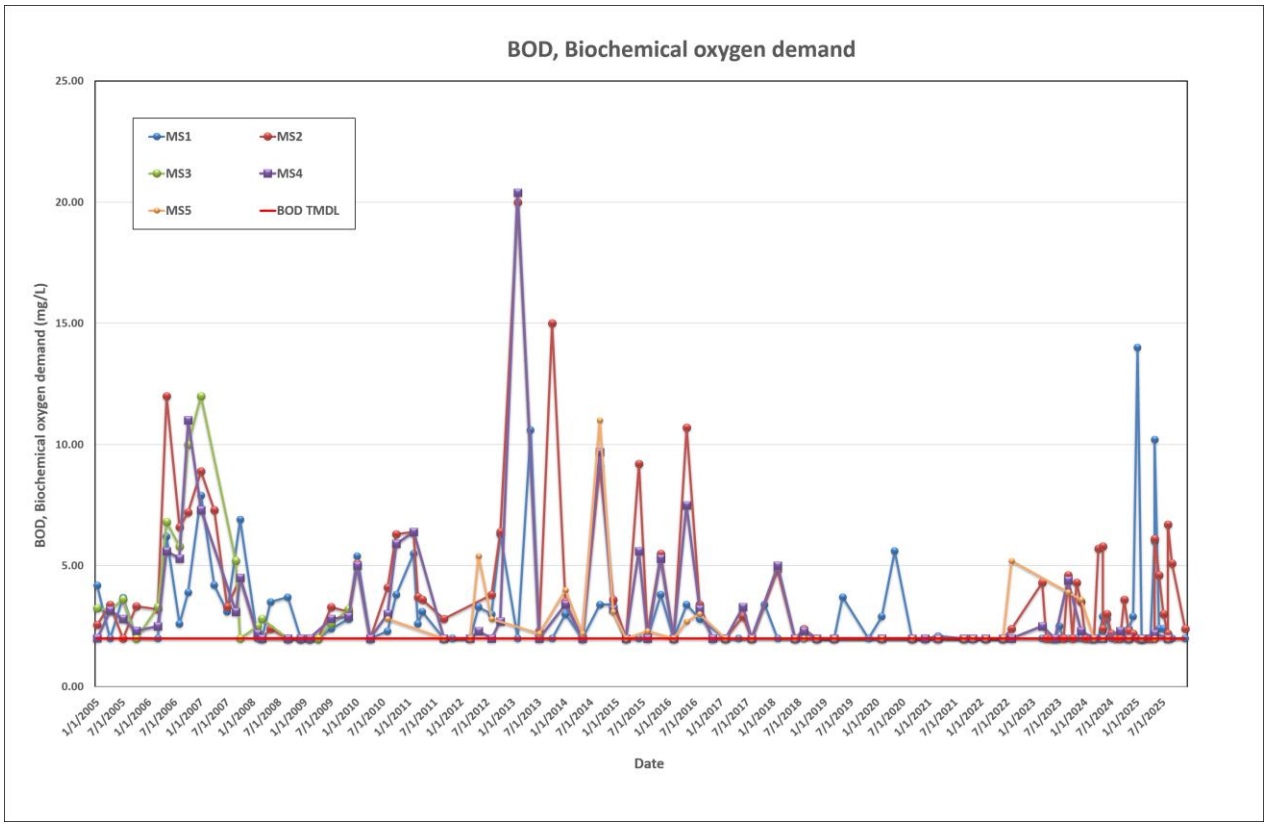


Figure 6. Biological Oxygen Demand results for Munson Slough.

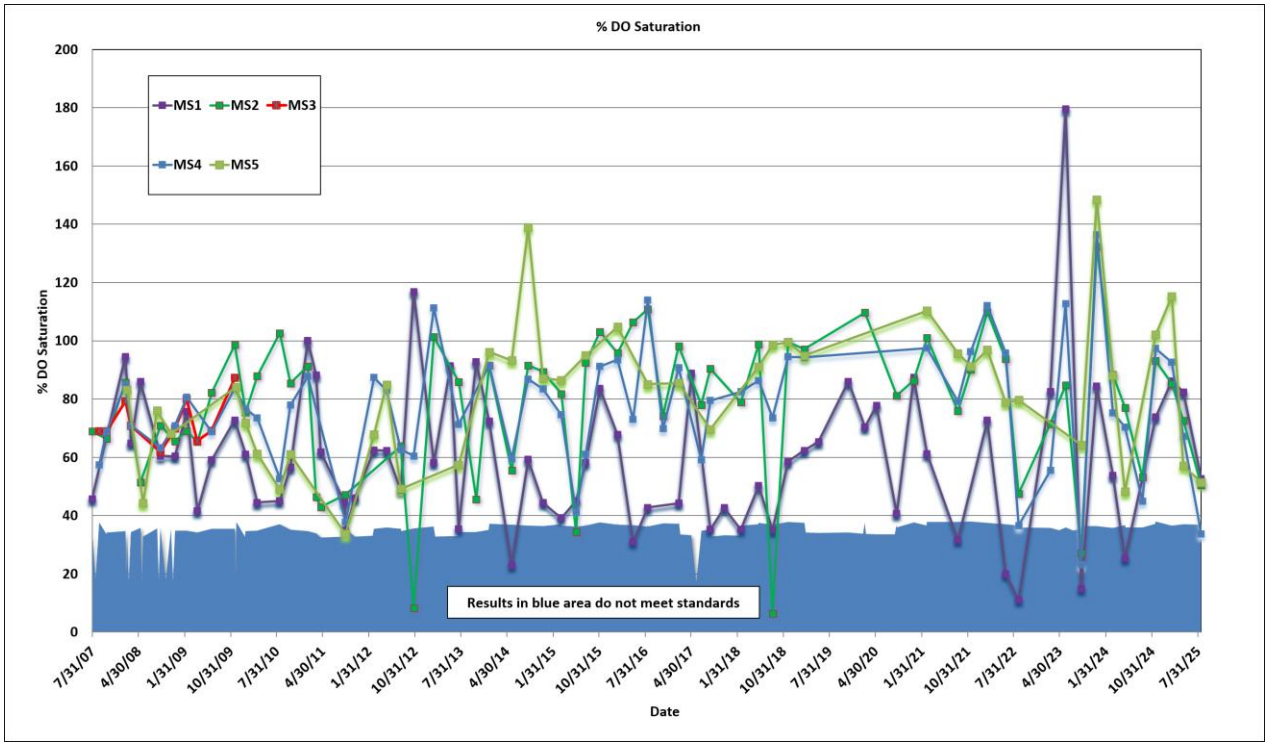


Figure 7. Dissolved Oxygen Percent Saturation results for Munson Slough.

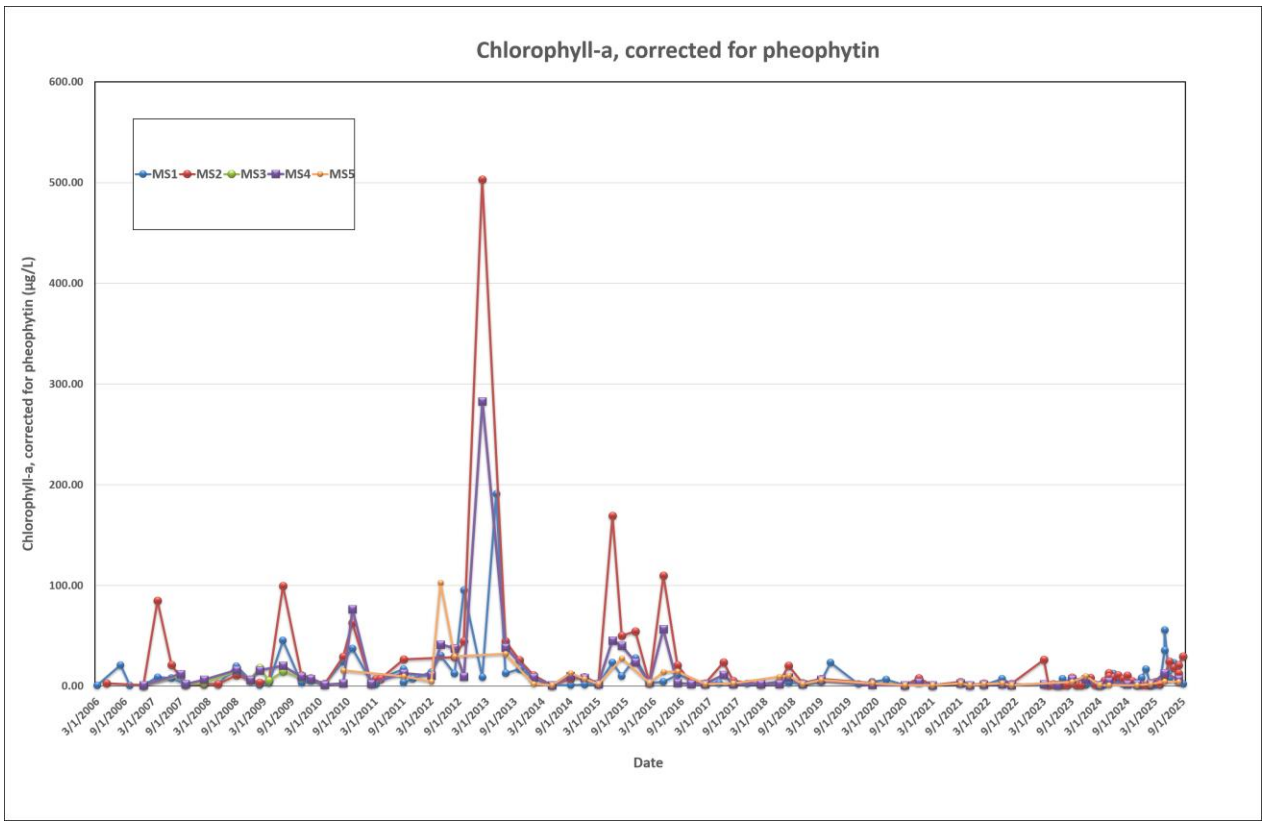


Figure 8. Chlorophyll-a results for Munson Slough.

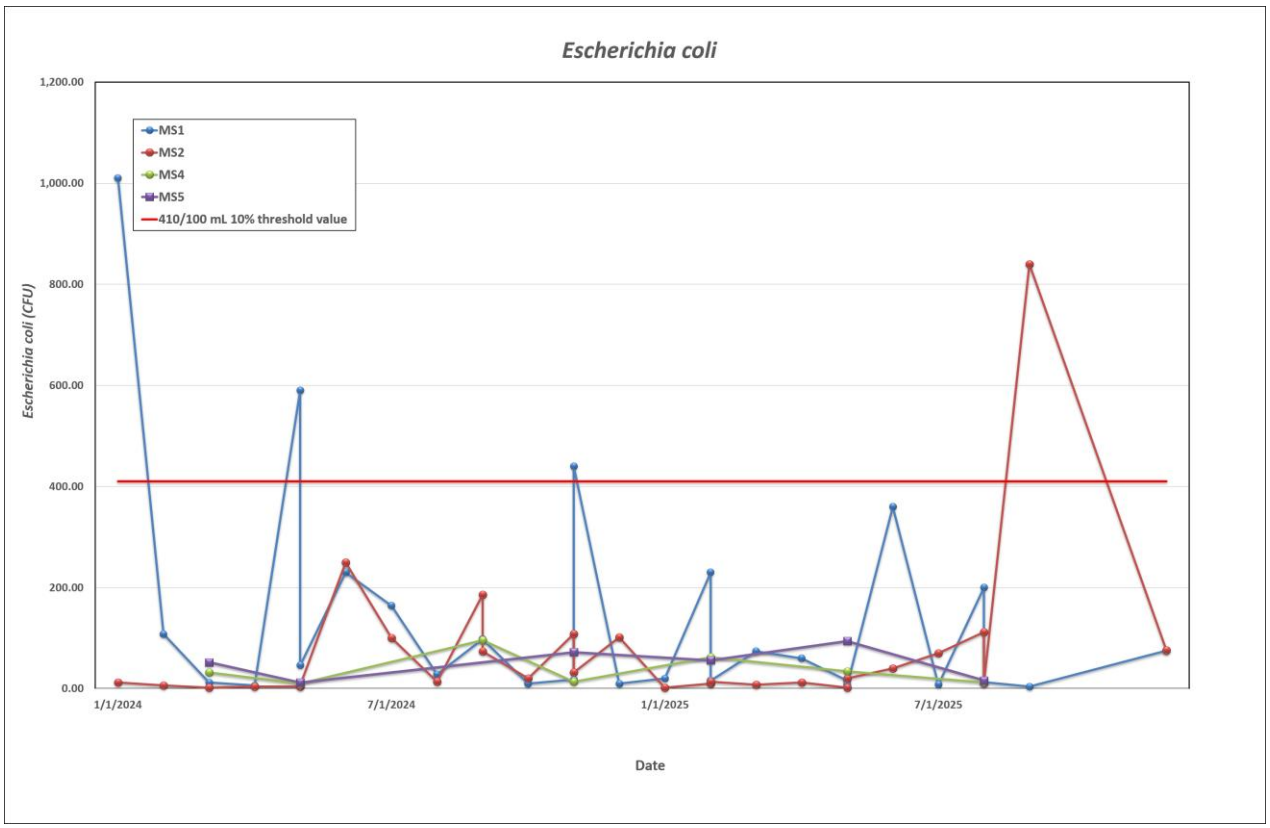
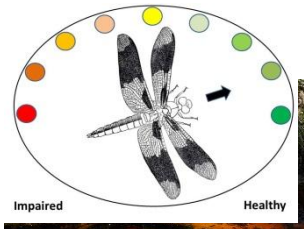


Figure 9. 2024-2025 *E. coli* results for Munson Slough.

9. Ochlockonee River Basin

Freeman Creek EcoSummary



Freeman Creek is a tannic, slightly acidic, phosphorus-limited stream that flows into Lake Talquin and is located in western Leon County.

The majority of the 4,013-acre watershed is relatively undeveloped (as shown in **Figure 1**). Transportation and utilities land uses make up approximately 1% of the watershed upstream of the sampling location. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

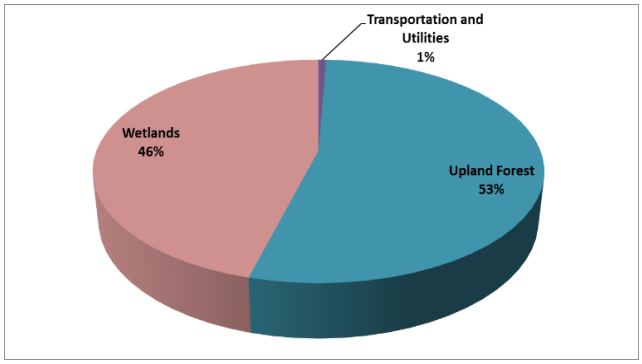


Figure 1. Freeman Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of the Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Nutrients

The nutrient thresholds and results are found in **Table 1**. The NNC criteria were not exceeded for either parameter. It does appear that nitrogen levels are increasing. It is unknown at this time what the cause(s) may be.

In June 2021 and September 2024, Freeman Creek was not flowing, with water levels low enough that the stream was composed of a series

of disconnected puddles. In contrast, the creek was flooded and had extended far into the floodplain during September 2021 sampling event. Because sampling conditions were not appropriate in these cases, water quality samples were not collected, which prevented the Numeric Nutrient Criteria from being calculated.

Table 1. Total Nitrogen and Phosphorus results and NNC thresholds for Freeman Creek.

Freeman Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2006	0.19	0.00
2007	0.27	0.00
2008	0.27	0.00
2009	0.24	0.00
2010	0.34	0.01
2011	0.44	0.01
2012	0.44	0.01
2013	0.42	0.00
2014	0.44	0.01
2015	0.50	0.01
2016	0.48	0.01
2017	0.59	0.01
2018	0.48	0.01
2019	0.30	0.01
2020	0.54	0.01
2021	-	-
2022	0.43	0.01
2023	0.54	0.01
2024	-	-
2025	0.51	0.01

Dissolved Oxygen

Freeman Creek's percent dissolved oxygen (DO) saturation values were below the criteria several times during the sampling period (**Figure 2**). Staff believe that this condition is natural since Freeman Creek has passed several bioassessments and there appears to be no anthropogenic causes of the low DO levels.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410, 10% threshold value of samples collected over a 30-day period was exceeded (5,400/100 mL) during the November 2016 sampling event. It is probable that the extremely high number was the result of wildlife in the area or possibly due to a laboratory error. No exceedances have been noted since.

Metals

Water quality criteria for iron during was exceeded during the 2nd and 3rd quarters of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

The biochemical oxygen demand (BOD) result for February 2024 was extremely elevated (10.9 mg/L). The average result over the entire sampling period (2006-2025) is 2.3 mg/L. Other water quality parameters appeared normal during that sampling event, suggesting this was an isolated incident.

Conclusions

Based on ongoing sampling, Freeman Creek met the NNC thresholds for the Big Bend Bioregion. The DO saturation values were below the criteria several times during the sampling period. Staff believe that this condition is natural since Freeman Creek has passed several bioassessments and there appears to be no anthropogenic causes of the low DO levels (e.g., elevated

nutrient levels). Water quality criteria for iron during was exceeded during the 2nd and 3rd quarters of 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

The BOD result for February 2024 was extremely elevated but appears to be an isolated incident.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 44.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

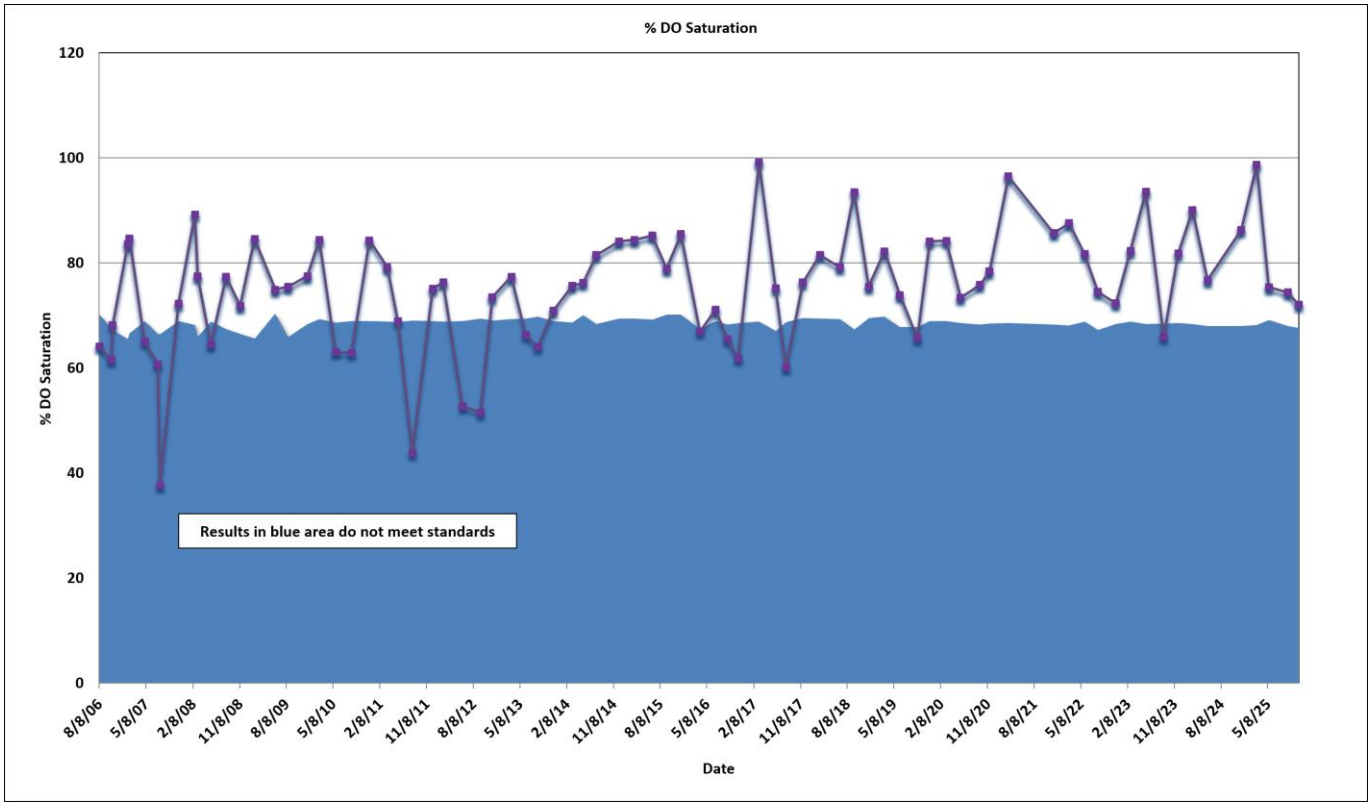
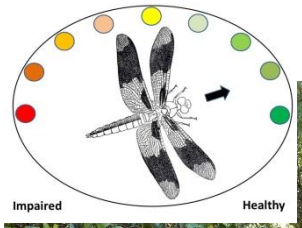


Figure 3. Dissolved Oxygen Percent Saturation results for Freeman Creek.

Harvey Creek EcoSummary



Harvey Creek is a tannic, slightly acidic, phosphorus-limited stream that flows into Lake Talquin and is located in western Leon County.

The majority of the 5,679-acre watershed is relatively undeveloped (as shown in **Figure 1**). Agriculture, urban and residential land uses make up approximately 4% of the watershed upstream of the sampling station. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

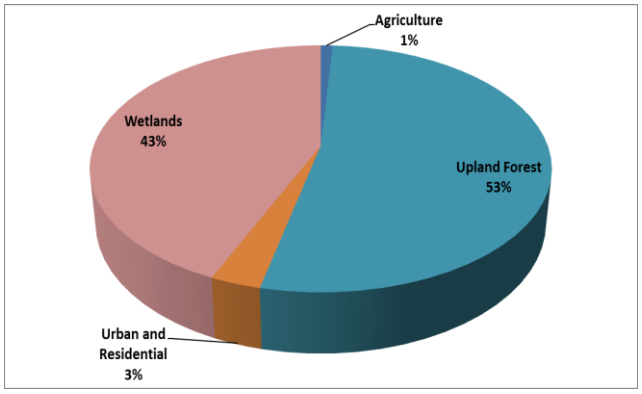


Figure 1. Harvey Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). The latest Stream Condition Index (SCI) bioassessment was conducted in 2025. This information is used to determine the health of the Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Nutrients

The nutrient thresholds and results are found in **Tables 1 and 2**. The NNC criteria were not exceeded for either parameter.

Table 1. Total Nitrogen results and thresholds for Harvey Creek.

Harvey Creek	Instream Protection Criteria			
	TN (1.03 mg/L)			
Year	39	HAR1	HAR2	HAR3
2006	0.11	-	-	-
2007	0.17	-	-	-
2008	0.15	-	-	-
2009	0.15	-	-	-
2010	0.33	-	-	-
2011	0.43	-	-	-
2012	0.39	-	-	-
2013	0.21	-	-	-
2014	0.35	-	-	-
2015	0.22	-	-	-
2016	0.29	-	-	-
2017	0.33	-	-	-
2018	0.40	-	-	-
2019	0.20	-	-	-
2020	0.29	-	-	-
2021	0.24	0.34	0.20	0.20
2022	0.27	0.36	0.24	0.23
2023	0.38	0.51	0.39	0.33
2024	0.27	-	-	-
2025	0.26			

Table 2. Total Phosphorus results and thresholds for Harvey Creek.

Harvey Creek	Instream Protection Criteria			
	TP (0.18 mg/L)			
Year	39	HAR1	HAR2	HAR3
2006	0.00	-	-	-
2007	0.00	-	-	-
2008	0.00	-	-	-
2009	0.00	-	-	-
2010	0.00	-	-	-
2011	0.01	-	-	-
2012	0.00	-	-	-
2013	0.00	-	-	-
2014	0.00	-	-	-
2015	0.01	-	-	-
2016	0.01	-	-	-
2017	0.01	-	-	-
2018	0.01	-	-	-
2019	0.01	-	-	-
2020	0.01	-	-	-
2021	0.01	0.00	0.00	0.00
2022	0.01	0.01	0.00	0.00
2023	0.01	0.01	0.01	0.00
2024	0.01	-	-	-
2025	0.01			

Escherichia coli

E. coli levels exceeded the Class III water quality standard daily limit of > 410, 10% threshold value of samples collected over a 30-day period in December 2016 (770/100 mL) and September 2024 (450/100 mL). Since the watershed is relatively undeveloped, the exceedance could be attributed to wildlife in the area, though FDEP, through their own sampling, have determined that anthropogenic sources were identified using genetic marker and tracer data. To better track potential sources of *E. coli*, Leon County added additional water quality stations to the watershed starting in 2021 and ending in 2024 (**Figure 2**). None of the additional stations exceeded the standard (**Figure 3**). Interestingly, the only other sample collected during the September 2024 event (West Black Creek) also had atypically elevated levels of *E. coli* that day. The elevated bacteria levels could have been the result of local low water levels concentrating wildlife in areas with flowing water. There were no exceedances in 2025.

Stream Condition Index (SCI) and Habitat Assessment

The results of the Habitat Assessment score for Harvey Creek characterize the stream habitat in the low end of the optimal category (**Table 3**). Habitat availability, although sub-optimal, presented high-quality roots and snags, with fewer leaf packs present. Channel characteristics were very natural with the expected pools, bends, and stable stream banks. In keeping with the habitat assessment and the water quality that exhibited a high dissolved oxygen concentration, low conductivity and low turbidity, the SCI scoring category was healthy, scoring a 58 (**Table 4**). Compared to previous years, Harvey Creek scored lower, but within the healthy categorical range. Harvey Creek scored 78 (exceptional) in 2019 and 65 (healthy) in 2022.

The macroinvertebrate community present at the Harvey Creek site was moderately rich (50 taxa) and displayed 15 sensitive (per FDEP) taxa, accounting for 30% of the taxa richness. Only two FDEP very tolerant taxa were noted. No single group or taxon exerted a strong numerical dominance of the community. The stonefly taxa *Leuctra* sp., the trichopteran taxa *Oecetis sphyra/morsei,* and the sensitive dipteran taxa *Hemerodromia* sp. were the most abundant taxa in both vials. Long-lived taxa were also well represented in the SCI sample (seven) and accounted for 14% of the total taxa. Included in the sensitive taxa are one species of Ephemeroptera (mayflies), three species of Trichoptera (caddisflies), and two species of Plecoptera (stoneflies). Two species of sensitive Ephemeroptera, two species of sensitive Trichoptera, and one species of sensitive Plecoptera previously recovered from this station were not present in the 2025 SCI sample. The EPT taxa are widely regarded as the groups of aquatic insects that contain large numbers of pollution sensitive taxa. In total 13 EPT taxa, were recovered in the 2025 SCI: one ephemeropteran taxa, two plecopteran taxa and ten trichopteran taxa. Cumulatively for SCI samples conducted in 2019, 2022, and 2025, 95 discreet taxa have been recovered from the Harvey Creek site. Of these, 23 are FDEP listed sensitive species. The EPT score for the cumulative collection at the site is 20.

Click here for more information about the Stream Condition Index and Habitat Assessments.

Conclusions

Based on ongoing sampling, Harvey Creek met the nutrient thresholds for the Big Bend Bioregion. The results of the Habitat Assessment characterize the stream habitat in the low end of the optimal category. The SCI score indicated the presence of a stream biological community that is healthy.

Other water quality parameters appear to be normal, and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites 39, HAR1, HAR2, and HAR3.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Table 3. Habitat Assessment results for Harvey Creek.

Harvey Creek	Score	Category
Substrate Diversity	14	Suboptimal
Substrate Availability	9	Marginal
Water Velocity	20	Optimal
Habitat Smothering	19	Optimal
Artificial Channelization	18	Optimal
Bank Stability	8, 8	Suboptimal, Suboptimal
Riparian Zone Width	10, 10	Optimal, Optimal
Riparian Vegetation Quality	10, 10	Optimal, Optimal
Final Habitat Assessment Score	**136**	
Interpretation	**Optimal**	

Table 4. Stream Condition Index (SCI) results for Harvey Creek.

Harvey Creek	**Vial 1**	**Vial 2**
Stream Condition Index Metrics Scores		
Total Taxa	7.50	6.79
Ephemeroptera Taxa	0	1.25
Trichoptera Taxa	6.67	7.78
% Filter Feeder	0	0
Long-lived Taxa	10	10
Clinger Taxa	5	9
% Dominance	8.13	9.05
% Tanytarsini Taxa	0	0
Sensitive Taxa	6.00	6.67
% Tolerant Taxa	6.68	6.68
SCI Vial Score	55.54	60.24
Stream Condition Index Score	**58**	
Score Interpretation	**Healthy**	

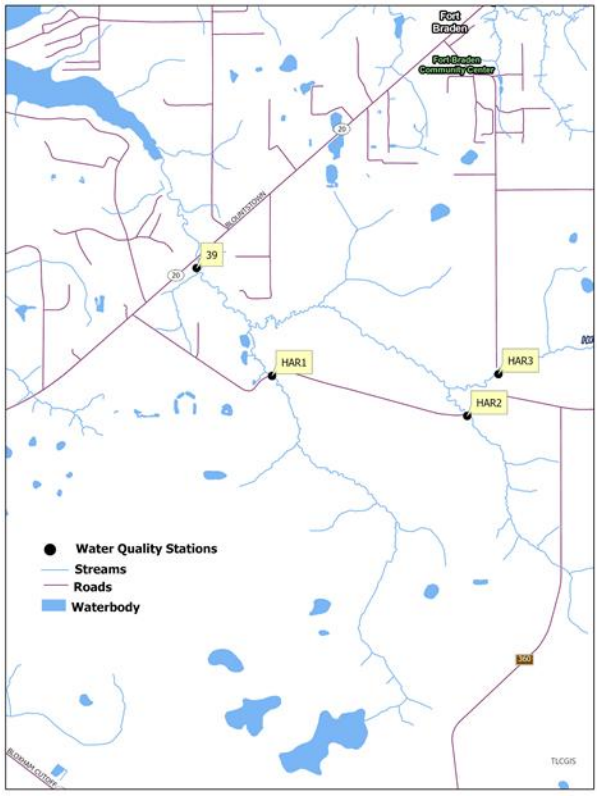


Figure 2. Locations of Water Quality Station 39 and the newly established HAR1, HAR2, and HAR3 on Harvey Creek.

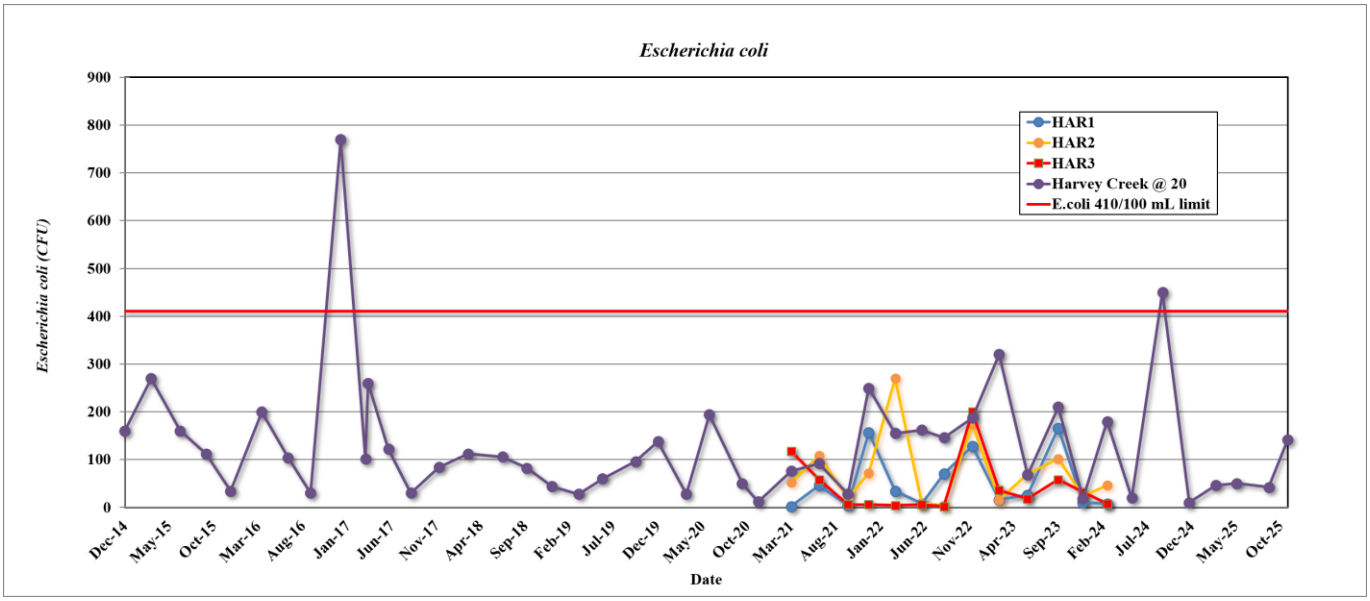
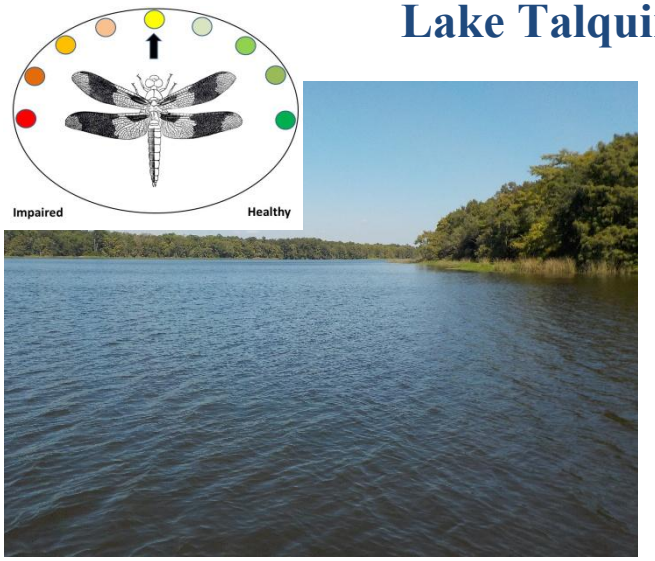


Figure 3. *E. coli* results for Harvey Creek.

Lake Talquin EcoSummary



The 7,782-acre Lake Talquin is considered an Outstanding Florida Water by the Florida Department of Environmental Protection (FDEP) and is located in western Leon County. Its basin extends into surrounding Florida counties as well as southern Georgia. In 1970, Florida Power Corporation donated the land that is now Lake Talquin State Park along the southern shoreline of the lake.

The lake was formed in 1929 when the Jackson Bluff Dam was constructed on the Ochlockonee River to produce hydroelectric power. The dam, built and managed by the West Florida Power Company (later to become Florida Power Corporation) who operated the facility until 1970, was abandoned as a power plant and turned over to the Florida Department of Natural Resources (later to become FDEP). FDNR/FDEP managed the dam without producing power until 1981. The City of Tallahassee then took over the dam, and in August 1985, the plant became operational as the C. H. Corn Hydroelectric Power Generating Plant. In 2017, the City did not renew its lease to operate the power plant and turned the dam back over to the State.

Approximately 35% of land use in the 1,019,525-acre Ochlockonee Basin is agriculture, rangeland, urban, transportation or utilities (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

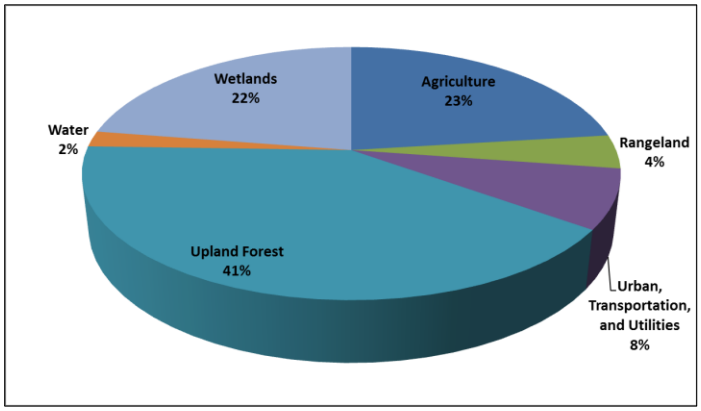


Figure 1. Lake Talquin watershed land use.

Because of nitrogen and phosphorus issues in Lake Talquin, the lake received a Total Maximum Daily Load (TMDL) by the Florida Department of Environmental Protection (FDEP) in 2022. The TMDL requires the lake to meet the nutrient TMDL concentrations, which, based on mean concentrations from the 2008-2014 period, will require a 19 percent reduction for Total Nitrogen (TN), and a 21 percent reduction for Total Phosphorus (TP). The primary Margin Of Safety (MOS) in the Lake Talquin TMDL derivation is the use of the TMDL target set to the magnitude of the chlorophyll-a Numeric Nutrient Criteria (NNC) of 20.0 µg/L as a model-derived Arithmetic Geometric Mean (AGM), with a never-to-exceed frequency. Given that the criterion allows one exceedance in a 3-year period, this expression gives reasonable assurance that the selected TN and TP reductions will achieve the generally applicable chlorophyll-a criterion under all hydrologic conditions.

Background

Healthy, well-balanced lake communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow) and sediment samples are collected annually. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

In addition to site specific TMDLs, the State of Florida uses NNC to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to 2024's Hurricane Helene, the appropriate number of water quality samples required to calculate the NNC could not be collected for that year. While sampling requirements could not be met, nutrient levels at all stations appear to be similar to what had been found in previous years.

Water quality results and thresholds are found in **Table 1**. While Lake Talquin's chlorophyll-a and Total Phosphorus standards were exceeded over the period of record, there have been no exceedances since 2016.

Dissolved Oxygen (DO)

Dissolved oxygen saturation values were below the Class III water quality limits during certain events (**Figure 2**). In most cases, the low oxygen values are results from deep water (> 4 meter) readings. There does not appear to be any stratification in the water column, which could prevent oxygen transfer from the surface to lower levels. It is thought that microbial activity in the organic sediment demands more oxygen than can be readily replaced leading to low DO levels. While the run of the river reservoir cannot be considered "natural", it is normal for organic rich sediments to result in low DO levels immediately above the sediment surface. Anthropogenic activities upstream (e.g., agricultural) can make such conditions worse. However, when the lake was created, organic-rich bottomland forest was flooded. These pre-existing bottomland trees (still onsite and submersed) are continuing to release nutrients into the system, contributing to oxygen demand.

FDEP now requires oxygen level readings to be taken only in the top two meters of the water column for TMDL purposes, so Leon County no longer takes deep water readings, hence the "improved" DO readings.

Iron

Stations LT1, T02, T0C2, T0D, and T0E2 exceeded water quality criteria for iron during

the 1st quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Talquin due to elevated levels of mercury.

Click here for more information about fish consumption advisories in Leon County.

Other Parameters

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

Long term sampling demonstrates that Lake Talquin did not always meet the chlorophyll-a and phosphorus thresholds for the Big Bend Bioregion, though the NNC has been met since 2017. Staff consider the low DO results taken in deeper water a normal condition for Lake Talquin. Several stations exceeded water quality criteria for iron during the 1st quarter of 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Table 1. NNC thresholds and sample results for Lake Talquin. Results in bold signify exceedances of the State criteria.

Colored Lakes	Chlorophyll-a > 20.0 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	5	0.49	0.04
2005	6	0.52	0.04
2006	4	0.66	0.05
2007	8	0.83	0.06
2008	9	0.83	0.06
2009	3	0.65	0.07
2010	10	0.75	0.05
2011	**31.3**	0.78	**0.06**
2012	**21.7**	0.72	0.05
2013	**26.8**	0.81	**0.08**
2014	4.8	0.78	0.06
2015	**22.9**	0.78	**0.06**
2016	**22.2**	0.86	**0.07**
2017	7.9	0.83	0.08
2018	10.4	0.88	0.07
2019	14.1	0.70	0.07
2020	10.1	0.71	0.09
2021	2.7	0.68	0.06
2022	11.3	0.63	0.06
2023	6.5	0.74	0.07
2024	-	-	-
2025	11.5	0.67	0.06

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites LT1, T0C2, T0D, T0E2, and T0LR.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

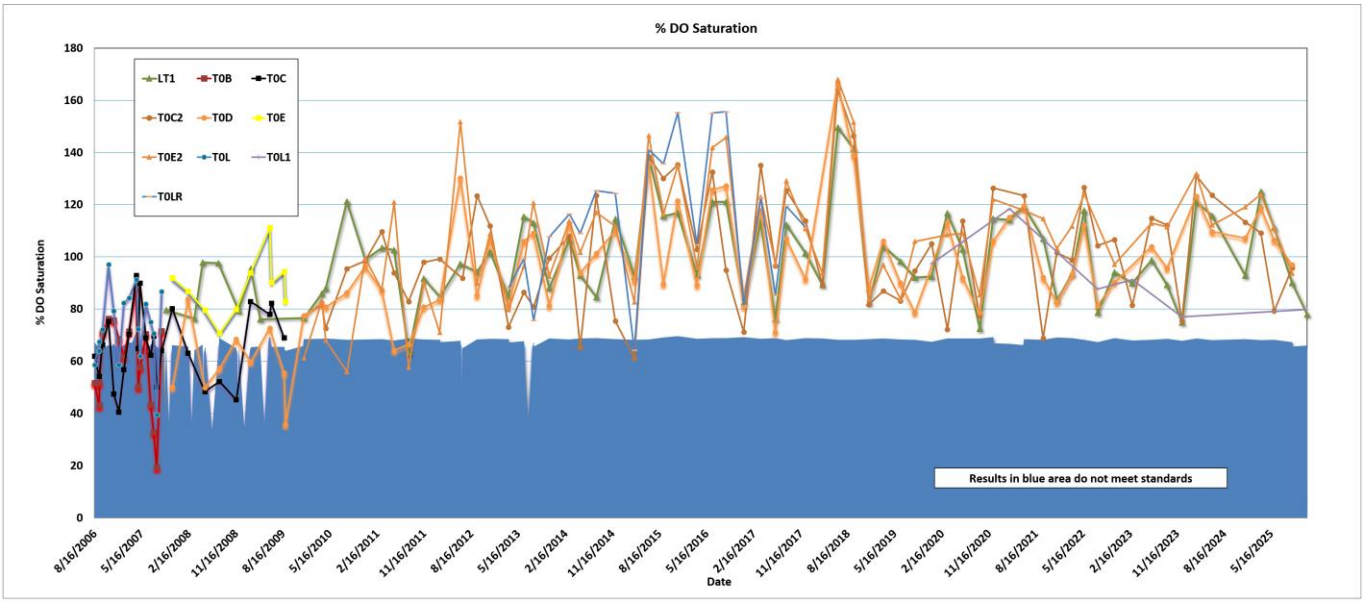
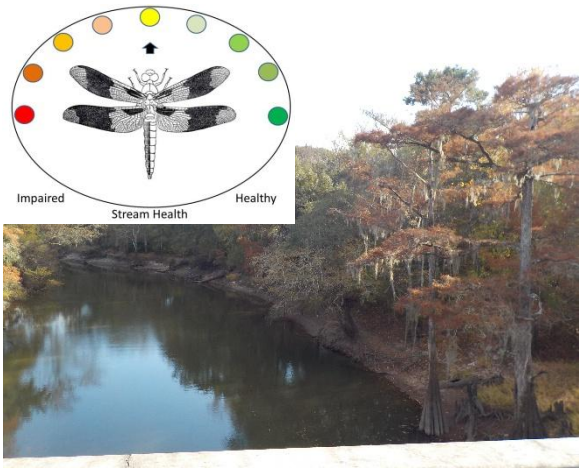


Figure 2. Dissolved Oxygen Percent Saturation results for Lake Talquin. Several sampling stations have been deactivated while others have been added over the sampling period.

Ochlockonee River EcoSummary



The Ochlockonee River originates in south-central Georgia and flows about 206 miles south to Ochlockonee Bay in Florida, draining approximately 2,400 square miles in all or part of eleven counties between the two states. The river is impounded by the Jackson Bluff Dam, forming Lake Talquin.

The river has been declared an Outstanding Florida Water by the Florida Department of Environmental Protection (FDEP) and identified as an Integrated Wildlife Habitat (formerly known as a Strategic Habitat Conservation Area) by the Florida Fish and Wildlife Conservation Commission. Parts of the Ochlockonee River have been designated critical habitat for mussels by the U. S. Fish and Wildlife Service (F.A.C. 62-302, 2006, and Federal Register, 2007). Unfortunately, past agricultural and silvicultural practices, as well as point source problems, have led to increased turbidity, higher nutrient concentrations, bacterial problems, and increased sedimentation of the river.

Approximately 35% of land use in the 1,019,525-acre Ochlockonee River Basin upstream of the southernmost sample station is agriculture, rangeland, urban, transportation or utilities (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

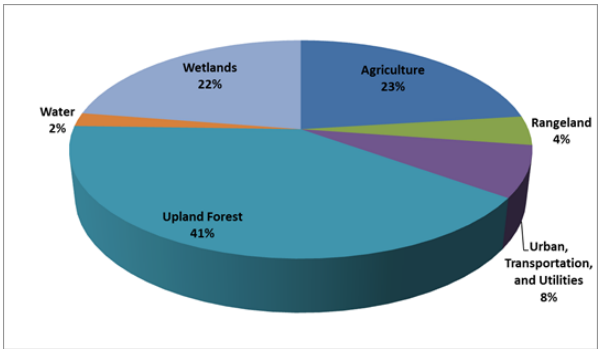


Figure 1. Ochlockonee River watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of the Ochlockonee River and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

According to FDEP requirements, Numeric Nutrient Criteria (expressed as an annual geometric mean) cannot be exceeded more than once in a three-year period.

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to hazardous water conditions during the 4th quarter of 2018, low water/backflow conditions in 2019 through 2021, Hurricane Helene in 2024, and further low water conditions in 2025, the required number of water quality samples to calculate the NNC could not be collected for those years. While sampling requirements could not be met, nutrient levels at all stations appear to be similar to what had been found in previous years.

The nutrient thresholds and results are found in **Table 1**. The NNC was exceeded several times for nitrogen at the furthermost upstream station (Fairbanks Ferry), and the Highway 90 station. NNC phosphorus levels were exceeded only once at the Highway 20 station. This suggests that excessive nutrients are being released into the river in the upper reaches, probably as the result of excessive erosion and/or fertilizer application. As the nutrients move downstream, they are assimilated through biological activity and bind to bottom sediments, as demonstrated by the lower levels in the downstream stations. The assimilation of nutrients is most noticeable with nitrogen.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for total phosphorus. Total nitrogen levels, especially in the upstream areas, were consistently higher than the criteria, though data "spikes" have decreased over time.

Dissolved Oxygen

While all three stations occasionally did not meet Class III water quality standards for DO (**Figure 4**), the Highway 20 station (located downstream from the Jackson Bluff Dam) was the most notable. This may be attributed to the operation of the dam. The gates of the dam can release water from either the surface (relatively oxygenated), or middle layer of water (lower levels of oxygen). During events where the water being released is mostly the "middle" layer of water, DO levels would tend to be depressed. Recent results show higher oxygen levels at the

Highway 20 station. Staff believe that this is the result of changes to the operation of the dam. Low flow conditions can also contribute to depressed oxygen levels, which may affect all stations along the river.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples during a 30-day period was exceeded at station OCHat90 during the 4th quarter of 2021. This is the only time this station has exceeded the *E. coli* standard since sampling for this parameter began in 2014. It is not known why *E. coli* levels were elevated. There have been no exceedances since.

Other Parameters

Chlorophyll-a data

Chlorophyll-a results are consistently elevated at the Ochlockonee River station located below the dam (T02-Och. River at 20) (**Figure 5**). As in previous years, it is assumed that most of the station's algal community (which chlorophyll-a indirectly measures) is being flushed out of Lake Talquin and levels would not normally be so elevated in the river.

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Iron

Stations 100 and Ochat90 exceeded water quality criteria for iron during the 1st and 2nd quarters of 2025 while station T02 exceeded the criteria during the 1st quarter. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in the Ochlockonee River due to elevated levels of mercury.

Click here for more information about fish consumption advisories in Leon County.

Conclusions

Based on ongoing sampling, the upper reaches of the Ochlockonee River did not meet the nitrogen nutrient threshold for the Panhandle East Region for several years. Sample stations occasionally did not meet Class III water quality standards for DO; the Highway 20 station (located downstream from the Jackson Bluff Dam) was the most notable, but oxygen levels have increased, probably as the result of changes in the operation of the dam. That same station's chlorophyll-a concentrations were consistently elevated when compared to the other stations. Water quality criteria for iron was exceeded at all stations in 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

Thank you for your interest in maintaining the quality of Leon County's water resources.

Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites 100, OCHat90 and T02.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Table 1. Total Nitrogen and Phosphorus results and thresholds for the Ochlockonee River. Results in bold are exceedances of the NNC.

Ochlockonee River	TN Instream Protection Criteria (1.03 mg/L)			TP Instream Protection Criteria (0.18 mg/L)		
Year	**Och at FF**	**Och at 90**	**Och at 20**	**Och at FF**	**Och at 90**	**Och at 20**
2000	**1.63**	**-**	0.14	**0.20**	**-**	0.06
2001	**1.21**	**-**	0.75	0.18	**-**	0.07
2002	**2.08**	**-**	0.76	0.14	**-**	0.08
2003	0.68	**-**	0.34	0.07	**-**	0.05
2004	0.68	**-**	0.64	0.06	**-**	0.03
2005	0.92	**-**	0.52	0.07	**-**	0.04
2006	**1.07**	**1.12**	0.70	0.09	0.07	0.04
2007	**1.56**	**1.16**	0.68	0.14	0.13	0.07
2008	**1.41**	1.02	0.70	0.16	0.12	0.07
2009	0.88	0.67	0.79	0.11	0.10	0.07
2010	**1.32**	**1.07**	0.72	0.13	0.09	0.06
2011	**1.60**	0.69	0.80	0.13	0.07	0.06
2012	**1.26**	0.99	0.77	0.14	0.15	0.06
2013	**1.17**	0.92	0.85	0.12	0.12	0.11
2014	**1.09**	0.88	0.68	0.11	0.08	0.06
2015	**1.20**	**1.08**	0.73	0.12	0.12	0.07
2016	**1.10**	**1.13**	0.79	0.14	0.12	0.07
2017	**1.20**	**1.10**	0.77	0.13	0.13	0.07
2018-2019	-	-	-	-	-	-
2020	1.01	-	0.74	0.11	-	0.08
2021	-	-	-	-	-	-
2022	**1.07**	0.99	0.64	0.13	0.10	0.06
2023	**1.18**	0.85	0.70	0.14	0.12	0.06
2024	**1.19**	-	-	0.12	-	-
2025	**-**	-	-	-	-	-

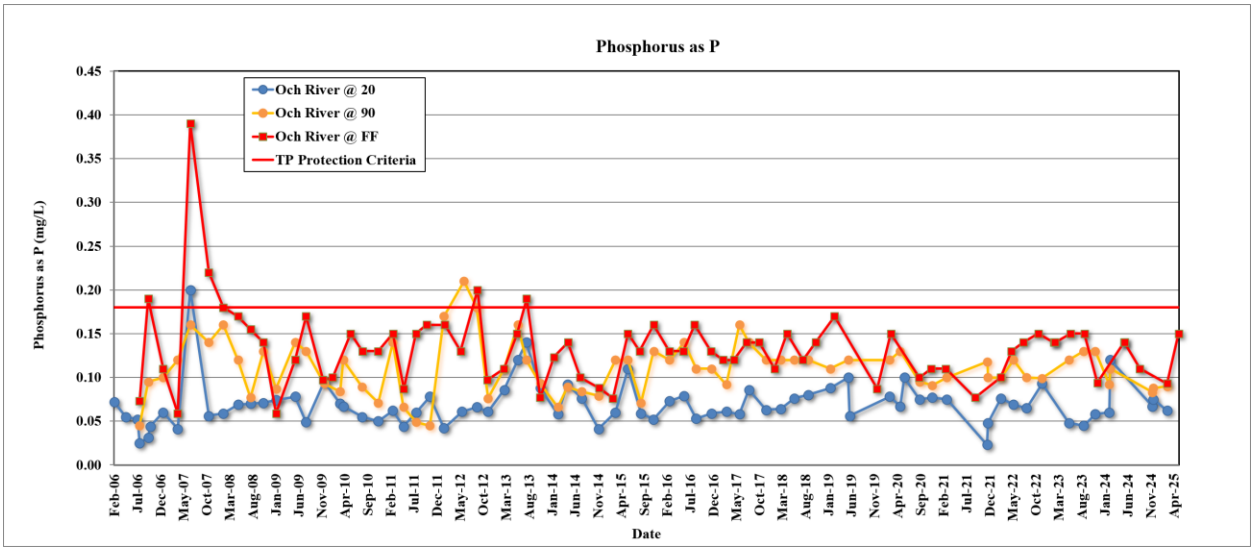


Figure 2. Total Phosphorus results for the Ochlockonee River.

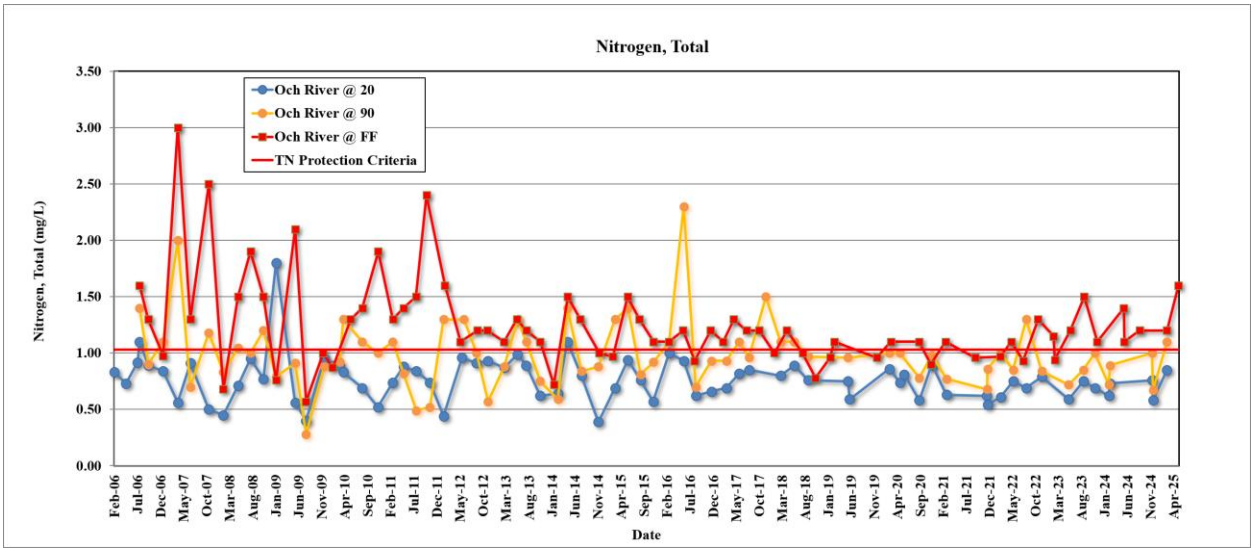


Figure 3. Total Nitrogen results for the Ochlockonee River.

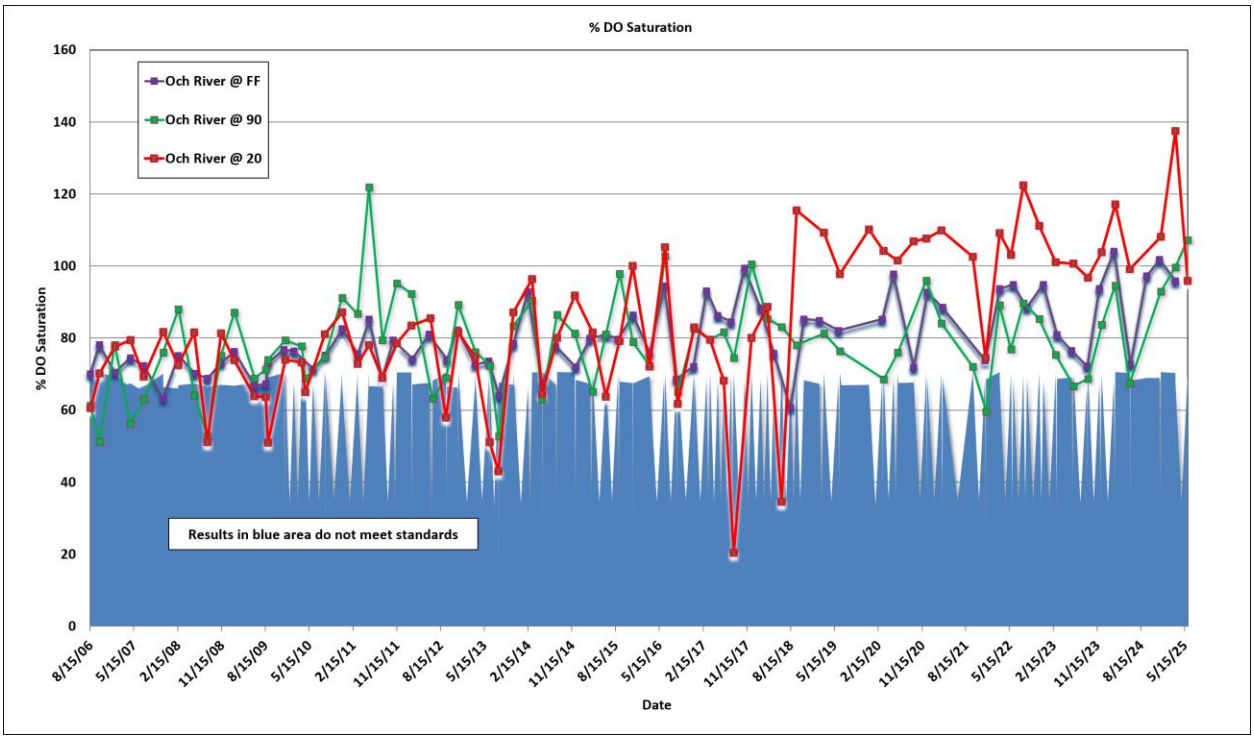


Figure 4. Dissolved Oxygen Percent Saturation results for the Ochlockonee River.

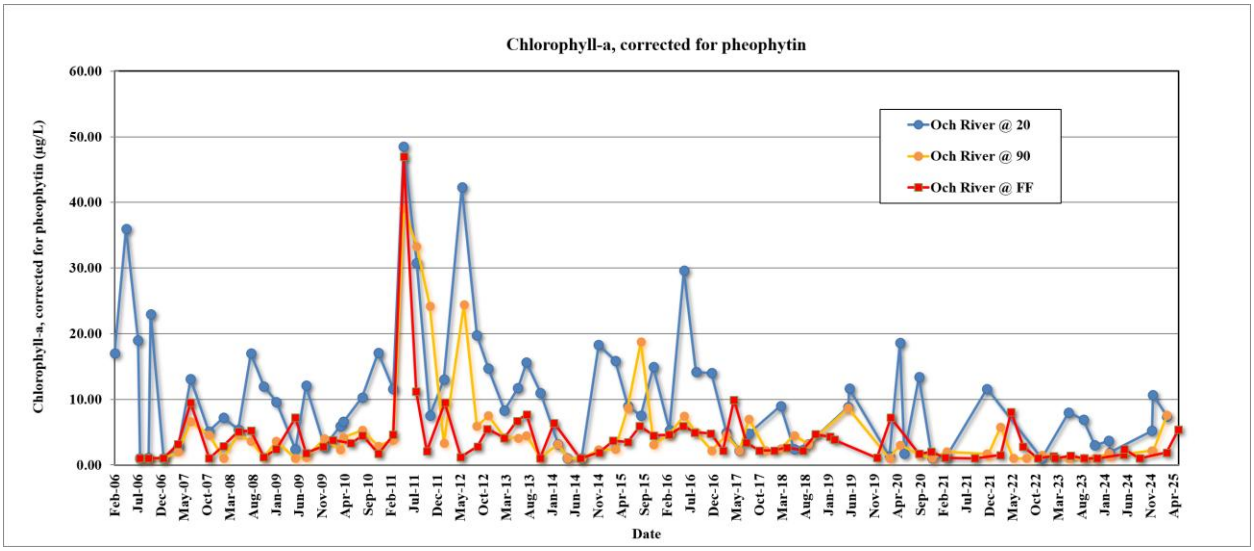
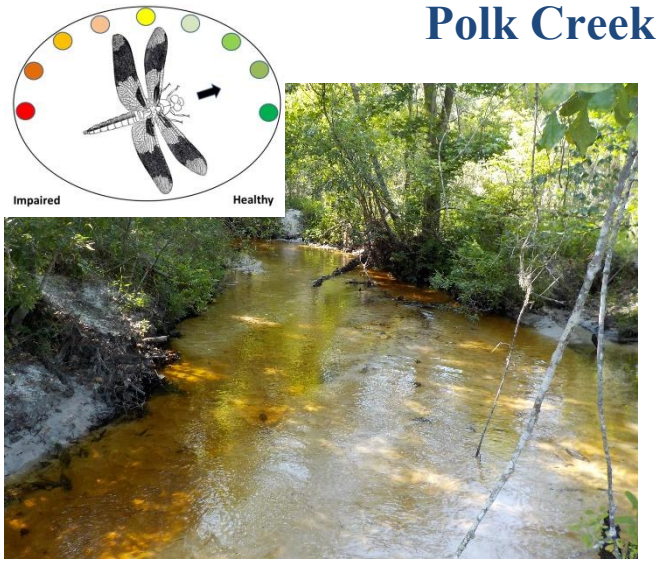


Figure 5. Chlorophyll-a results for the Ochlockonee River.

Polk Creek EcoSummary



Polk Creek is a minimally disturbed, slightly tannic stream located in western Leon County. The stream flows west, eventually reaching Lake Talquin.

Urban and residential, transportation and utilities land uses make up approximately 12% of the 2,328-acre watershed upstream of the sample station (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

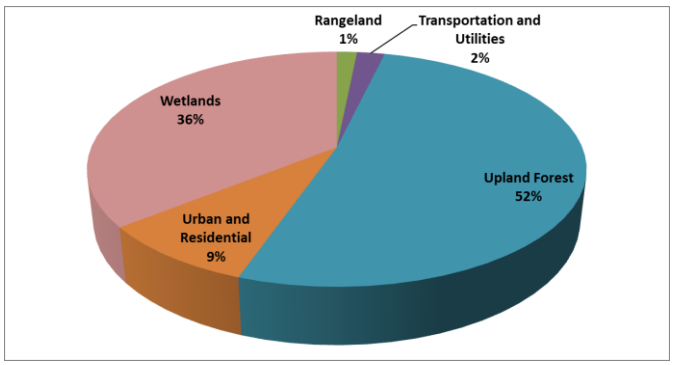


Figure 1. Polk Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Polk Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Water quality results and thresholds are found in **Table 1**. There have been no exceedances in the in NNC over the sampling period.

Table 1. NNC thresholds and sample results for Polk Creek, Station 38.

38	TN Threshold (1.03 mg/L)	TP Threshold (0.18 mg/L)
Year		
2007	0.44	0.02
2008	0.42	0.03
2009	0.22	0.04
2010	0.48	0.04
2011*	-	-
2012	0.46	0.04
2013	0.78	0.04
2014	0.54	0.04
2015	0.48	0.06
2016	0.56	0.05
2017	0.73	0.05
2018	0.63	0.05
2019	0.43	0.08
2020	0.54	0.06
2021	0.44	0.05
2022	0.44	0.05
2023	0.53	0.05
2024-2025*	-	-

*Due to low water levels, the NNC data requirements were not met and could not be calculated for 2011, 2024 and 2025.

Table 1. NNC thresholds and sample results for Polk Creek Station, PK1.

PK1	TN Threshold (1.03 mg/L)	TP Threshold (0.18 mg/L)
Year		
2022	0.47	0.03
2023	0.55	0.04

Escherichia coli (E. coli)

E. coli levels exceeded the Class III water quality standard several times over the sampling period. Since the watershed is relatively undeveloped, it was thought that elevated bacteria levels could be the result of wildlife in the area. FDEP, through their own sampling, have determined that anthropogenic sources have been identified using genetic marker and tracer data. To better track potential sources of *E. coli*, Leon County added an additional water quality station to the watershed starting in 2021 and ending in 2024 (**Figure 2**). While there were two exceedances at station PK1, there appears to be other sources of bacteria, since more exceedances were noted at station 38. The latest *E. coli* exceedances were noted during the 1st and 3rd quarters of 2025 at station 38 (**Figure 3**). While anthropogenic sources could be a source of bacterial contamination, there is beaver activity adjacent to the sampling site, so wildlife could also be a source of *E. coli*.

Other Parameters

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

E. coli exceedances continue to be a problem at Polk Creek. Nutrient thresholds were met for the Big Bend Bioregion. Other water quality parameters appear to be normal.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Sites 38 and PK1.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

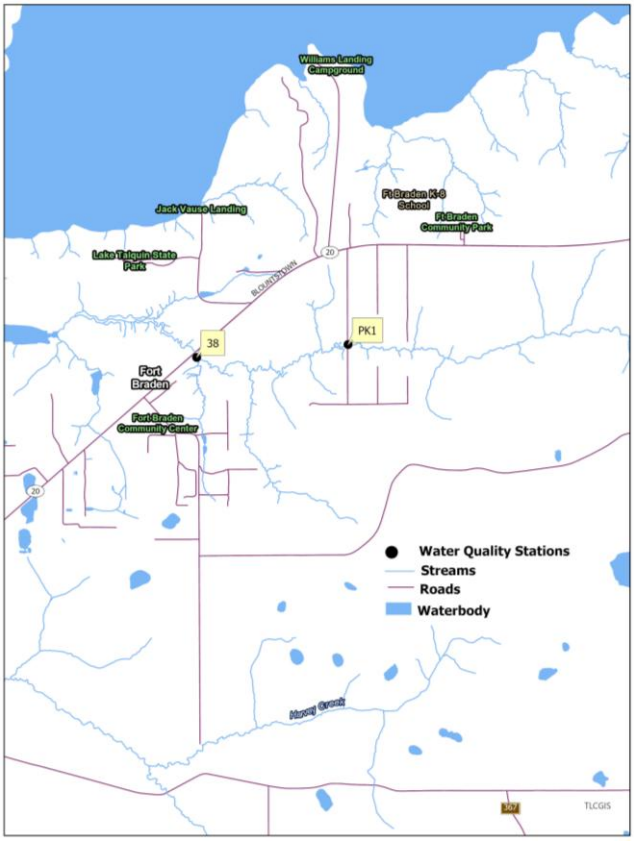


Figure 2. Locations of the Water Quality Station 38 and the newly established PK1 on Polk Creek.

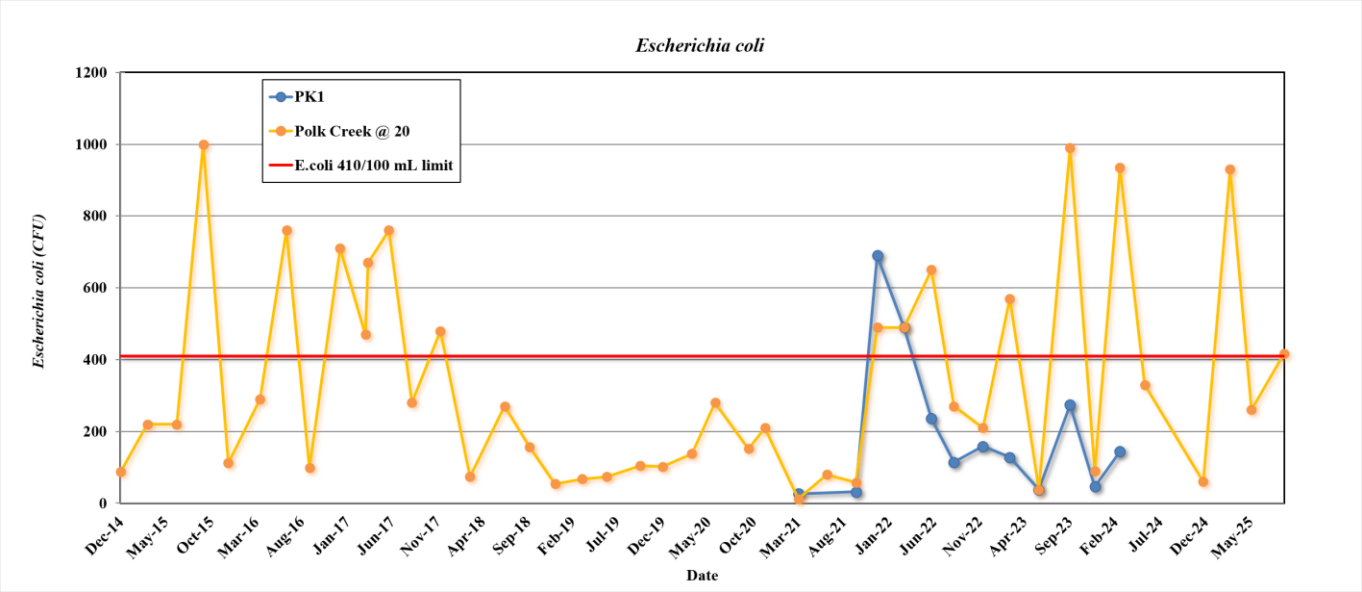
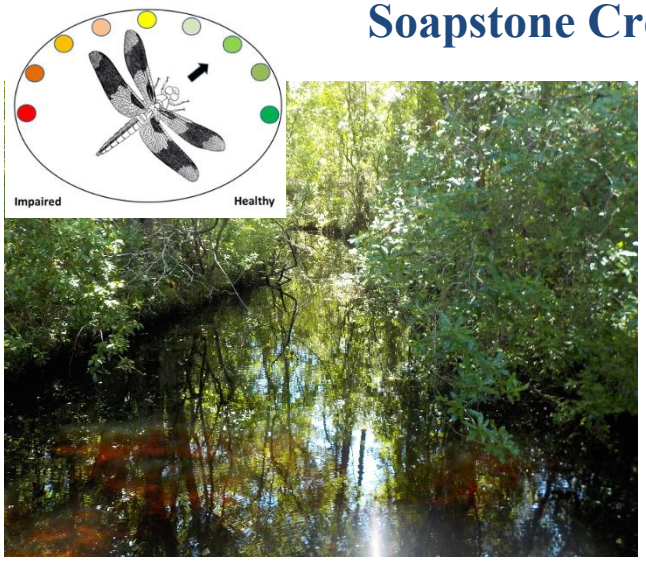


Figure 3. *E. coli* levels for Polk Creek.

Soapstone Creek EcoSummary



Soapstone Creek is a minimally disturbed, phosphorus-limited stream located in southwestern Leon County. The stream flows west, eventually reaching the Ochlockonee River downstream of Lake Talquin.

Soapstone Creek is aptly named due to its tendency to have foam form on the water's surface giving it a "soap sudsy" appearance. While foam is sometimes associated with pollution, it naturally forms under certain conditions. In this case, foam is naturally formed when water surface tension is reduced as natural oils and organic compounds (i.e., tannins) are released into the water from the surrounding wooded and boggy areas and float to the surface. Turbulence introduces air into the water forming foam.

The culvert associated with the bridge spanning the creek at County Road 375 frequently prevents the creek from flowing during low water conditions, preventing staff from sampling. Due to low water conditions, staff was only able to collect water quality samples intermittently throughout the sampling period.

While the majority of the 4,025-acre watershed is relatively undeveloped, urban and residential, utilities and transportation land uses make up approximately 3% of the watershed (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

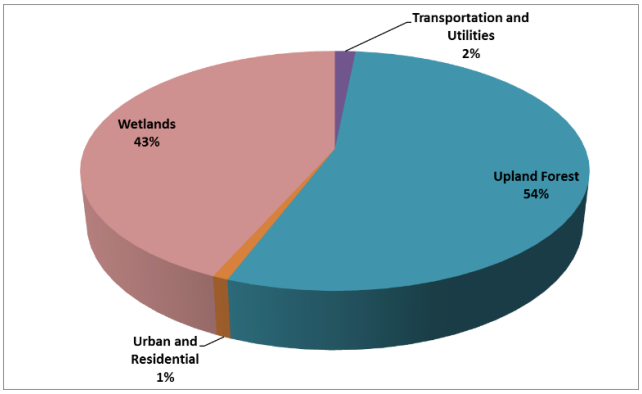


Figure 1. Soapstone Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Soapstone Creek and meets the requirements of the Florida

Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year could not always be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

Nutrients

The nutrient thresholds and results are found in **Table 1**. When the sampling criteria were met, the NNC was met. For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). During the May 2023 sampling event, the total nitrogen value was extremely high (3.4 mg/L). Further examination showed an elevated nitrite (NO_2) + nitrate (NO_3) value (2.7 mg/L), while ammonia (0.035 mg/L) and organic nitrogen (0.63 mg/L) values resembled more typical values for this system. Other water chemistry parameters were also typical of this system, so it is not known why nitrite (NO_2) + nitrate (NO_3) was so elevated. It is possible that the result could have been caused by laboratory error. Individual values rarely exceeded the instream criteria for total nitrogen and never exceeded the criteria for total phosphorus.

Dissolved Oxygen

As **Figure 4** shows, Soapstone Creek occasionally did not meet the Class III criteria for dissolved oxygen (DO). Staff believes that this is a natural condition for this location, since the creek is a low gradient blackwater stream that drains wetlands.

Table 1. Total Nitrogen and Phosphorus results and thresholds for Soapstone Creek.

Soapstone Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2008	0.64	0.01
2009	0.50	0.00
2010	0.51	0.01
2011- 2014	-	-
2015	0.60	0.01
2016-2025	-	-

Metals

Water quality criteria for iron during the 3rd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area, and no impairments were noted.

Conclusions

Based on ongoing sampling, Soapstone Creek met the NNC for the East Panhandle Region. As a result of low flow, the Class III criterion for dissolved oxygen was not always met during the sampling period. Water quality criteria for iron during the 3rd quarter of 2025. It appears that iron levels appear to be naturally occurring.

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site Soapstone.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

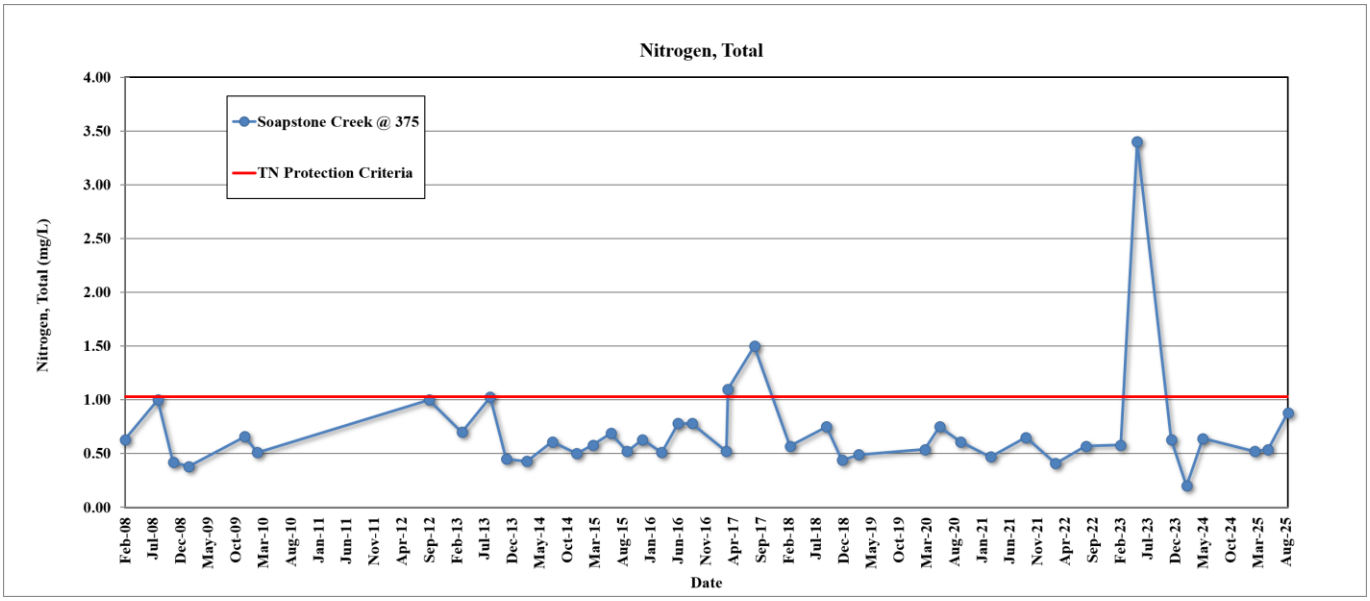


Figure 2. Total Nitrogen results for Soapstone Creek.

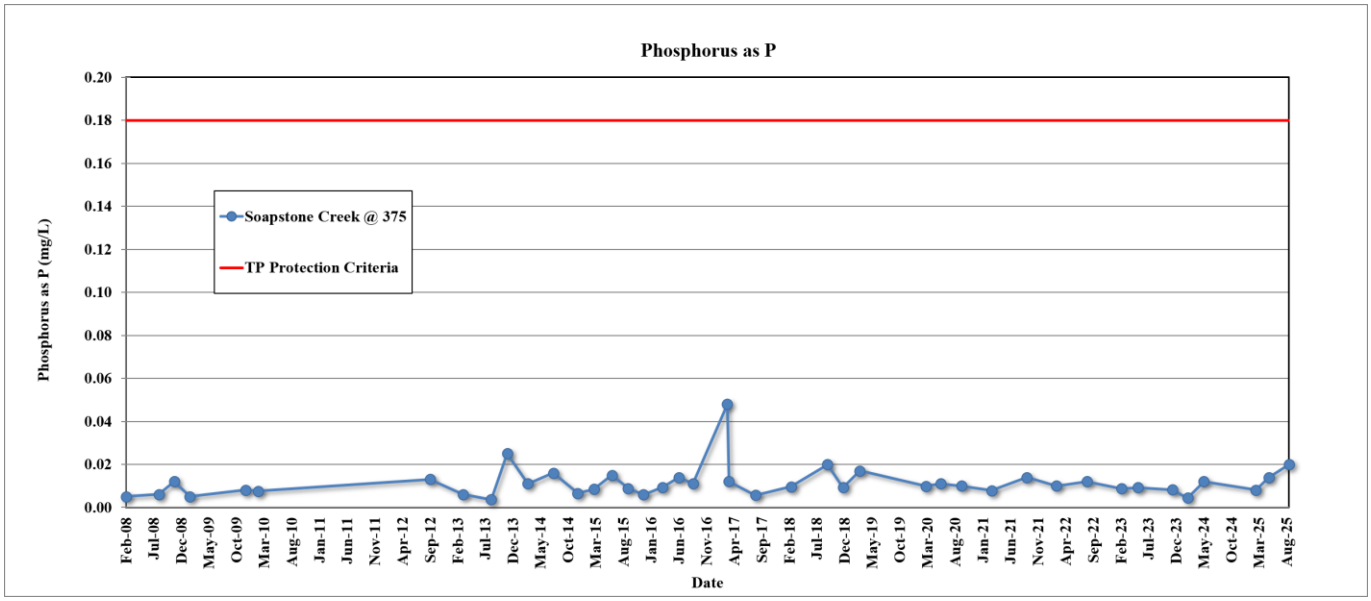


Figure 3. Total Phosphorus results for Soapstone Creek.

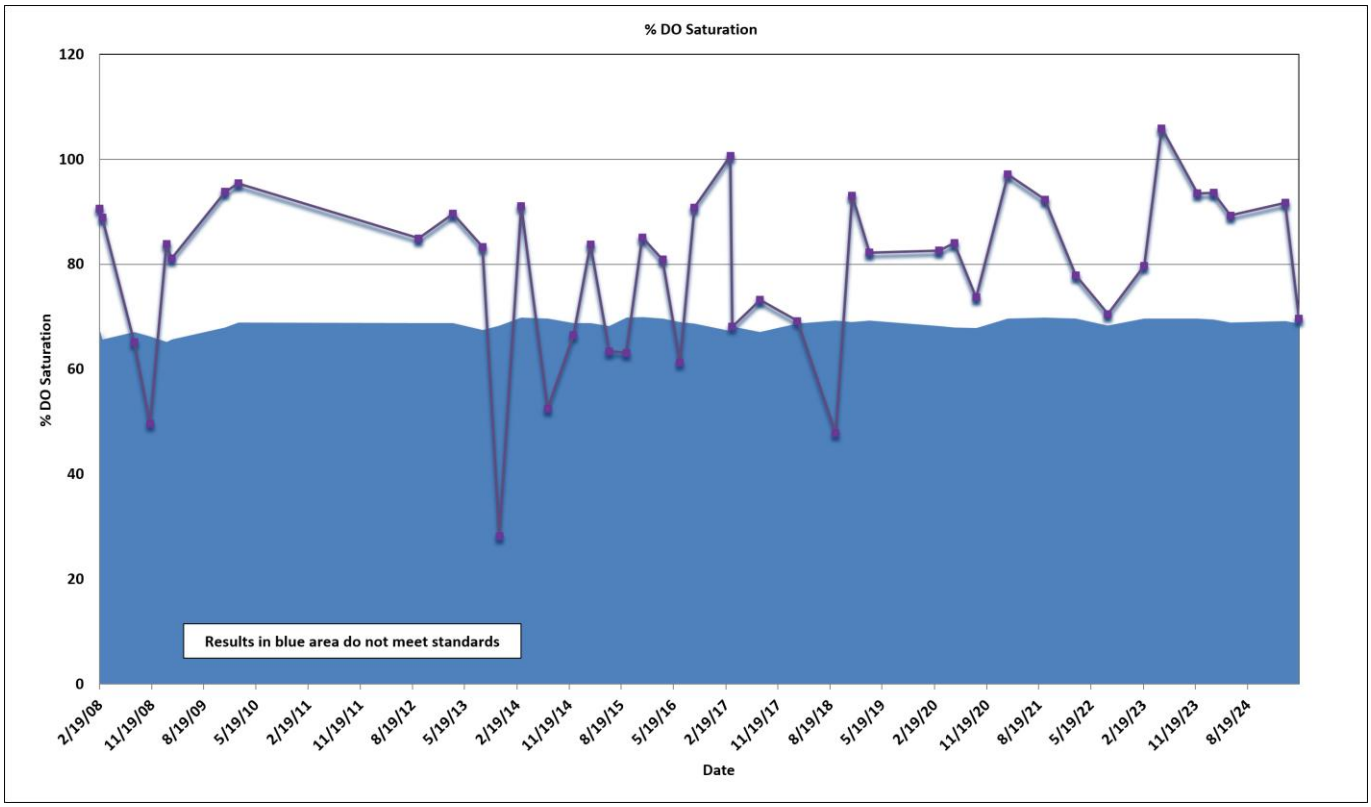
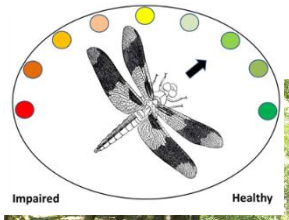


Figure 4. Dissolved Oxygen Percent Saturation results for Soapstone Creek.

West Black Creek EcoSummary



West Black Creek is a minimally disturbed, phosphorus-limited stream located in southwestern Leon County. The stream flows west, eventually reaching the Ochlockonee River downstream of Lake Talquin.

Upland forest and wetlands make up the entirety of the 11,237-acre watershed upstream of the sample station (as shown in **Figure 1**).

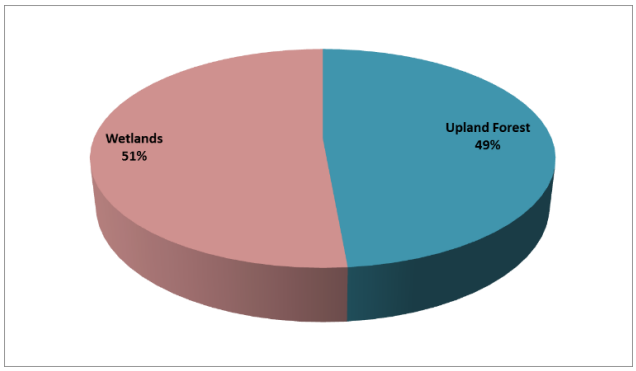


Figure 1. West Black Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

The creek was verified impaired by the Florida Department of Environmental Protection (FDEP) in 2008 and received a Total Maximum Daily Load (TMDL) for fecal coliforms that same year. The TMDL establishes the allowable loadings to the creek which would restore the creek to applicable water quality thresholds. In this case, fecal coliforms would have to be reduced by 33% to meet the criterion of fecal coliforms not exceeding 400/100 mL Most Probable Number (MPN) in 10% of the samples. However, the fecal coliform standard in Florida has been supplanted by standards developed for *Escherichia coli* as an indicator of bacterial contamination. FDEP is currently using the *E. coli* standard which states, “cannot exceed the 10% threshold value of 410 in 10% of more of the samples in any 30-day period”.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of the Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in

waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Water quality results and thresholds are found in **Table 1**. There have been no exceedances in the in NNC over the sampling period.

Table 1. NNC Thresholds and sample results for West Black Creek.

West Black Creek	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2006	0.15	0.01
2007	0.41	0.01
2008	0.29	0.02
2009	0.29	0.01
2010	0.34	0.02
2011	0.34	0.02
2012	0.38	0.02
2013	0.18	0.02
2014	0.53	0.02
2015	0.63	0.02
2016	0.54	0.02
2017	0.44	0.02
2018	0.68	0.02
2019	0.23	0.03
2020	0.60	0.02
2021*	-	-
2022	0.41	0.02
2023	0.48	0.02
2024	0.31	0.02
2025	0.57	0.02

*Due to high water levels, the NNC data requirements were not met and could not be calculated for 2021.

Fecal Coliforms and Escherichia coli (E. coli)

As mentioned previously, FDEP has set a TMDL for West Black Creek. While fecal coliform levels were elevated above the 400/100 mL Class III limit in 18% of the samples for Class III waters, there has been only one exceedance since 2008 (February 2012). Since the watershed is relatively undeveloped, the high coliform levels could be the result of wildlife in the area. As mentioned previously, *E. coli* standards have now replaced fecal coliform standards in Florida. The *E. coli* water quality limit of > 410 in 10% of samples collected over a 30-day period was exceeded (570/100 mL) during the September 2024 sampling event (**Figure 2**). Interestingly, the only other sample collected that day (Harvey Creek) also had atypically elevated levels of *E. coli* that day. The elevated bacteria levels could have been the result of local low water levels concentrating wildlife in areas with flowing water. There were no exceedances in 2025.

Metals

The water quality criteria for iron was exceeded during the 3rd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Conclusions

Based on ongoing sampling, West Black Creek met the NNC for the East Panhandle Region. Coliforms have been elevated in the past, but there were no water quality exceedances since the first quarter of 2012, and only one *E. coli* exceedance since *E. coli* sampling began in 2015. Water quality criteria for iron was exceeded during the 3rd quarter of 2025. It appears that iron levels, at least in part, appear to be naturally occurring.

Other water quality parameters appear to be normal.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 43.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

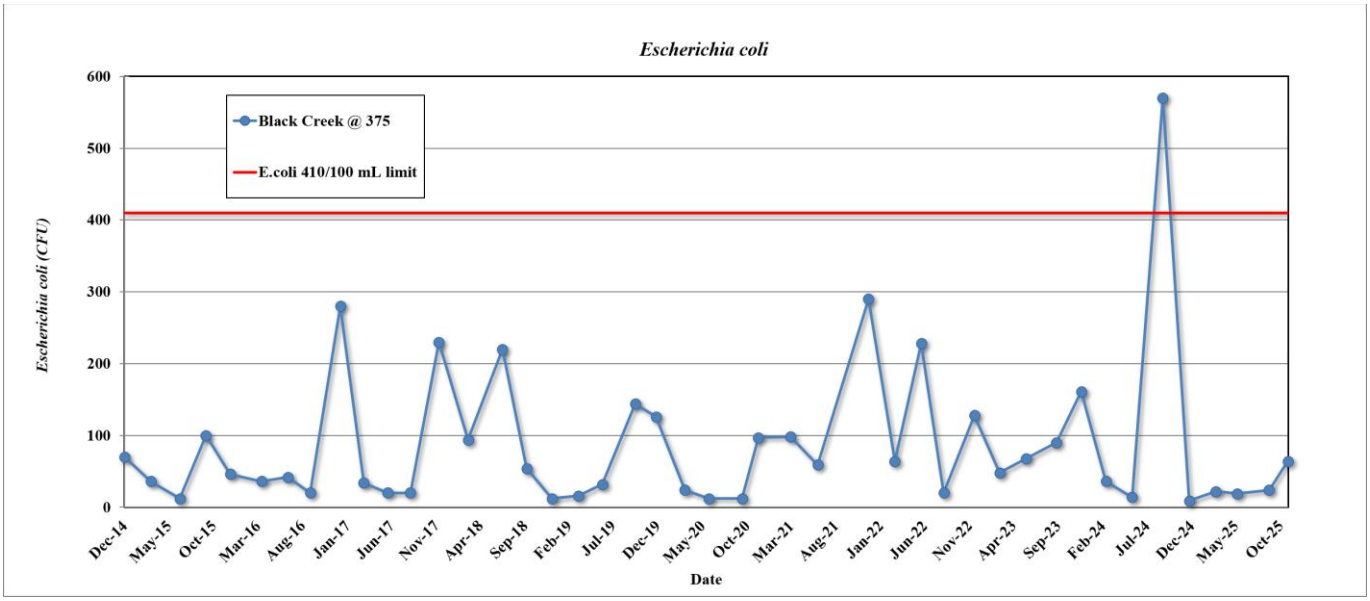


Figure 2. West Black Creek *Escherichia coli* results.

10. Patty Sink Basin

Patty Sink Drain EcoSummary



Patty Sink Drain is a slightly tannic, nitrogen-limited stream that flows south and eventually drains into Patty Sink and the Floridan Aquifer.

Approximately 28% of land use in Patty Sink's 12,975-acre watershed is agriculture, open land, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

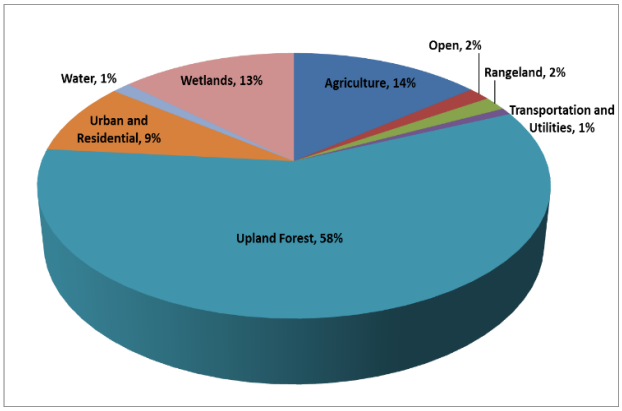


Figure 1. Patty Sink watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Patty Sink Drain and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions, four temporally independent samples per year could not be collected. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

Even though staff could not collect the required number of samples per calendar year, some conclusions can be made. For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for Total Phosphorus or Total Nitrogen.

Fecal Coliforms and Escherichia coli (E. coli)

Patty Sink Drain has a history of fecal coliform levels exceeding the Class III water quality standard (400/100 mL in at least 10% of the samples). *E. coli* standards have now supplanted fecal coliform standards in Florida. The *E. coli* water quality limit of > 410 in 10% of samples collected over a 30-day period have been exceeded three times (**Figure 4**) since *E. coli* sampling started (1st quarter of 2015). Since the watershed is relatively undeveloped, elevated *E. coli* levels are probably the result of wildlife or livestock (i.e., cattle) in the area. There have been no exceedances since 2018.

Metals

Patty Sink exceeded water quality criteria for iron during the 2nd quarter of 2025. Iron is abundant throughout the earth, composing up to 5% of the earth's crust. Leon County's soil type can allow iron to move through the soil and enter shallow groundwater and eventually enter surface waters. As iron is a parameter recently added to the sampling program, few samples have been collected and conclusions on the information collected continue to be tentative. It appears that iron levels, at least in part, appear to be naturally occurring.

Click here for more information on metal levels in Leon County waterbodies.

Other Parameters

Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Conclusions

Total Phosphorus and Total Nitrogen levels appear to meet the NNC. *E. coli* water quality limits were exceeded during the sampling period, but levels have been below Class III water quality standards since 2018. Iron levels exceeded water quality criteria during the 2nd quarter of 2025. Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and resources for more information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 5.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

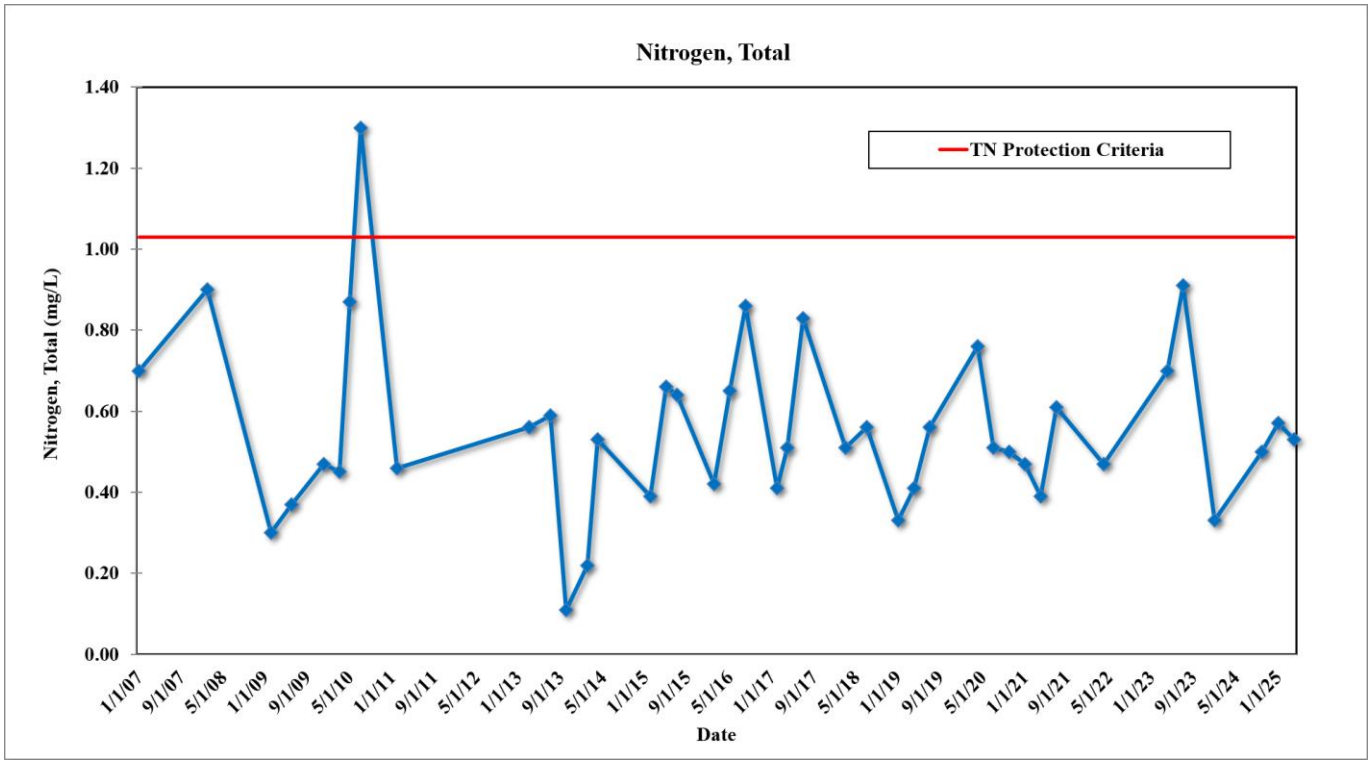


Figure 2. Total Nitrogen results for Patty Sink Drain.

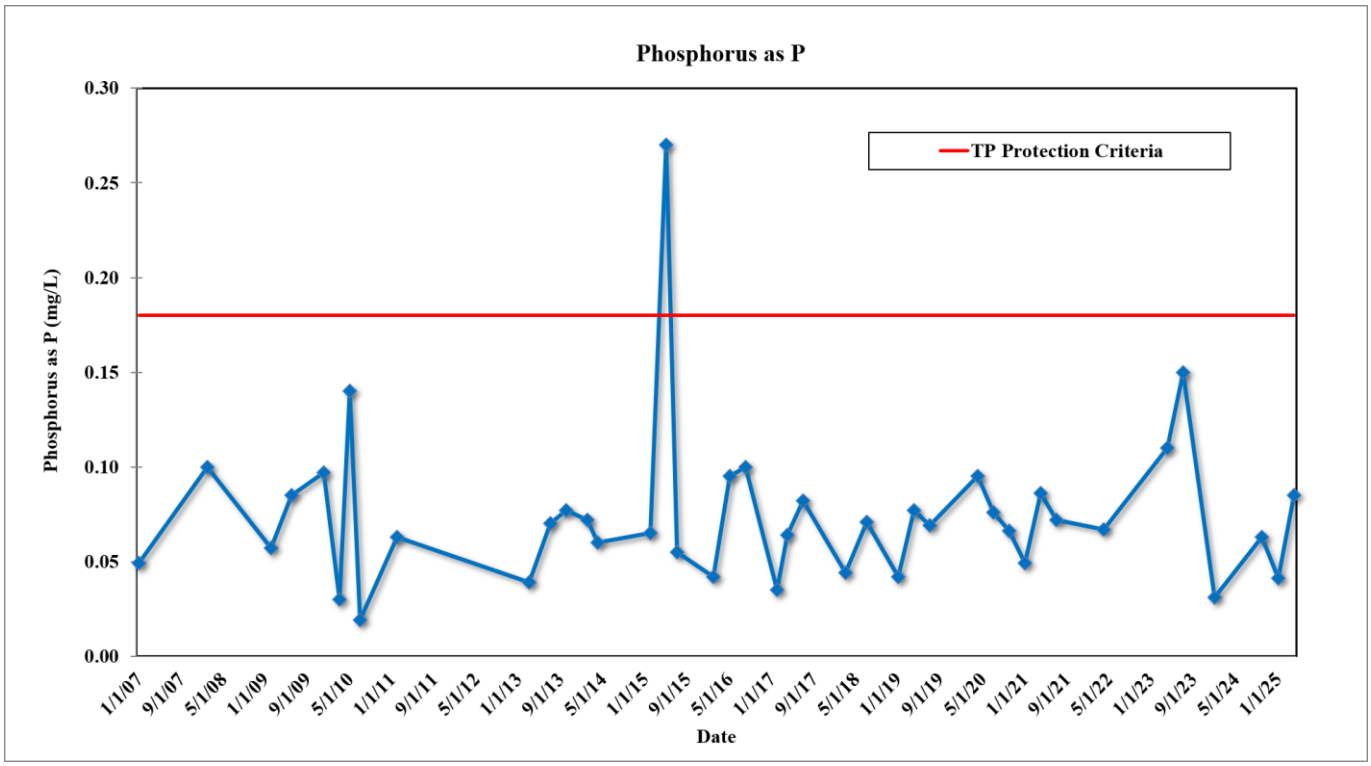


Figure 3. Total Phosphorus results for Patty Sink Drain.

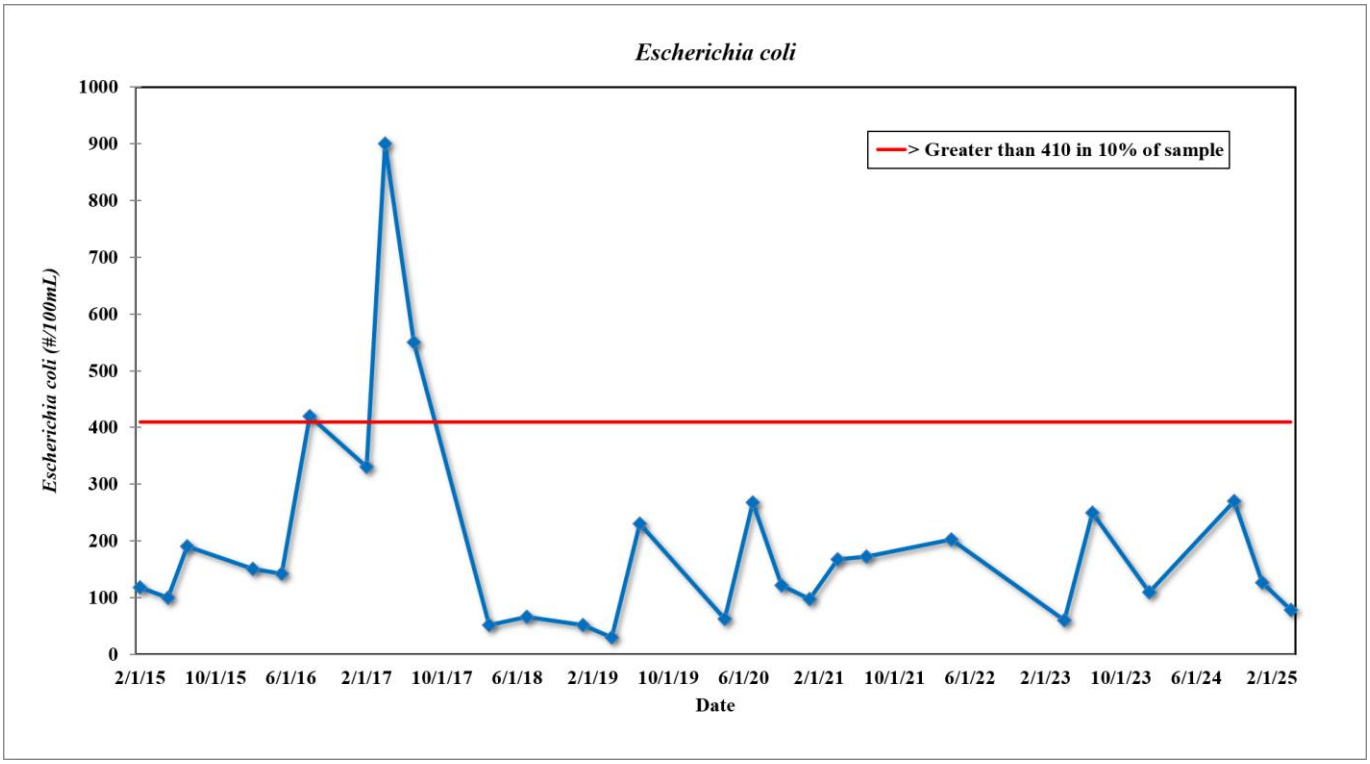


Figure 4. *E. coli* results for Patty Sink Drain.

11. St. Marks River Basin

Chicken Branch EcoSummary



Chicken Branch is located in southeastern Leon County. The stream is partially fed by Chicken Branch Spring and flows southeast, eventually draining into the St. Marks River.

As shown in **Figure 1**, the majority of the 6,572-acre watershed is relatively undeveloped. Agriculture, rangeland, transportation, utilities, urban and residential uses make up approximately 14% of the watershed. Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses. Watershed land use is changing; logging in the area adjacent to Chicken Branch and its spring impacted the system and may continue to do so.

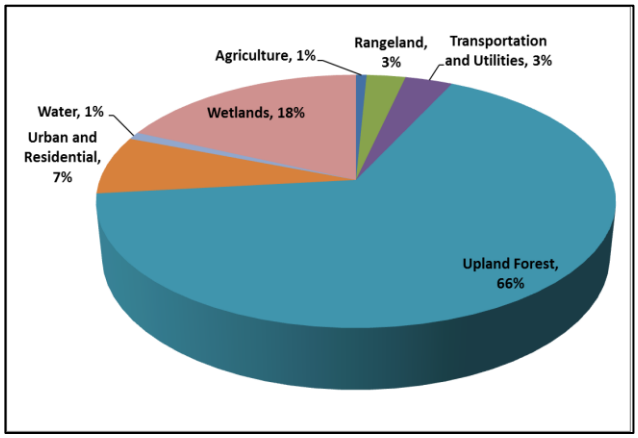


Figure 1. Chicken Branch watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Chicken Branch and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period. Replacement of the underlying culverts where Chicken Branch crosses under Old Plank Rd.

prevented water quality sampling during the 4th quarter of 2025 (**Figure 2**).

The nutrient thresholds and results are found in **Table 1**. When data requirements were met, nutrient values were shown to not exceed the state criteria. While not exceeding the NNC threshold, the 2017 geometric mean nitrogen levels are the highest on record; the June 2017 result (0.81 mg/L) is the third highest individual result since sampling begin in 2006. Substantial rainfall in the area immediately prior to the sampling could have affected nitrogen values via increased runoff into the system. The elevated color levels during the same event (150 PCU vs. a median of 40 PCU) suggest that runoff was a factor in the results. The following years' nitrogen results were considerably lower, so the elevated total nitrogen value in 2017 was probably an isolated event.

Table 1. Total Nitrogen and Phosphorus criteria and results for Chicken Branch.

Chicken Branch	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2006- 2008	-	-
2009	0.15	0.04
2010	0.43	0.05
2011- 2012	-	-
2013	0.27	0.03
2014	0.41	0.05
2015	-	-
2016	0.38	0.05
2017	0.50	0.05
2018	0.40	0.04
2019	0.30	0.06
2020	-	-
2021	0.38	0.05
2022	0.35	0.05
2023	0.34	0.06
2024-2025	-	-

Dissolved Oxygen

As **Figure 3** shows, Chicken Branch did not always meet the Class III criteria for dissolved oxygen (DO). Low DO levels are typical of Florida spring-run streams and are considered normal for Chicken Branch.

Other Parameters

Other water quality parameters appear to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling, Chicken Branch met the NNC for the Panhandle East Region. Staff consider the occasionally low DO values at Chicken Branch to be a natural condition for spring-fed systems.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 53.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov



Figure 2. Culvert replacement on Old Plank Road Rd.

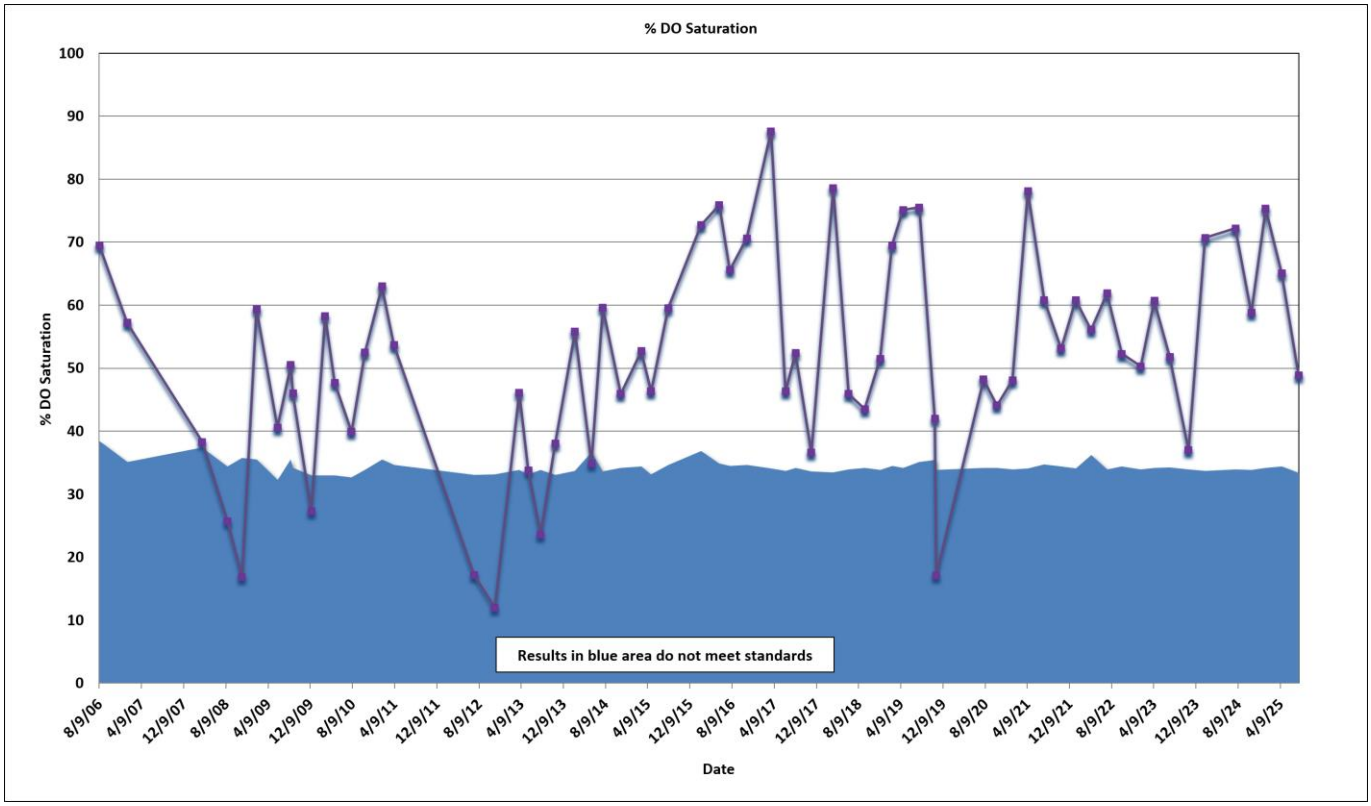
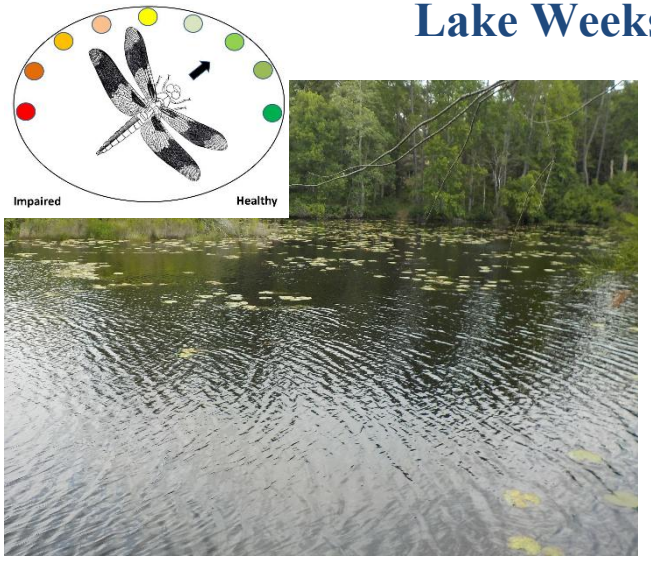


Figure 3. Dissolved Oxygen Percent Saturation results for Chicken Branch.

Lake Weeks EcoSummary



Lake Weeks is a small, shallow, 11-acre, tannic lake located in southeastern Leon County.

Approximately 41% of land use in the Lake Weeks 150-acre watershed is urban and residential (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

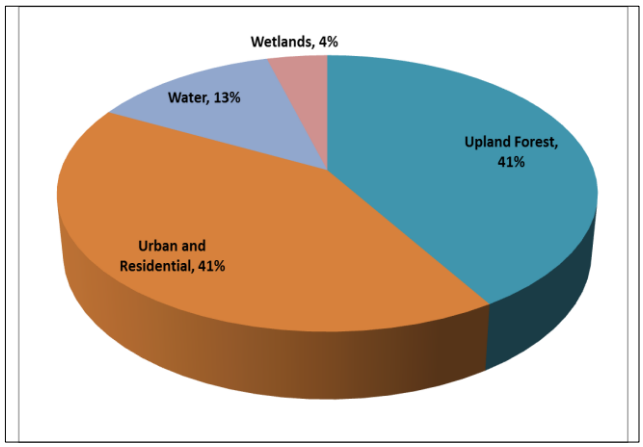


Figure 1. Lake Weeks watershed land use.

Background

Healthy, well-balanced lake communities may stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Sinkholes

In late February 2015, Lake Weeks developed two sinkholes that quickly drained the lake to levels that prevented sampling (< 1.2 feet by March 2nd) for the first two quarters of 2015. Lake levels rose to high enough levels that staff were able to resume sampling in the third quarter of 2015.

Methods

Surface water samples are collected quarterly (as field conditions allow. This information is used to determine the health of Leon County waterbodies and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP

requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Water quality results and thresholds are found in **Table 1**. Low water levels in 2012, along with a relatively constant source of nutrients, substantially concentrated the nutrients in the lake, exceeding the NNC in 2012. Since 2012, there have been no exceedances in the NNC.

Table 1. NNC thresholds and sample results for Lake Weeks. Results in bold signify exceedances of the State criteria.

Colored Lake	Chlorophyll-a 20.0 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	3.3	0.33	0.01
2005	1.7	0.42	0.01
2006	3.5	0.58	0.03
2007	4.9	1.00	0.02
2008	13.9	0.80	0.04
2009	2.6	0.32	0.01
2010	5.3	0.59	0.01
2011	14.2	0.79	0.03
2012	**47.5**	**1.49**	**0.07**
2013	19.7	0.87	-
2014	2.5	0.71	0.01
2015*	-	-	-
2016	10.3	0.72	0.02
2017	2.9	0.60	0.01
2018	2.5	0.55	0.01
2019	4.7	0.44	0.02
2020	3.8	0.61	0.03
2021	1.9	0.49	0.02
2022	5.3	0.50	0.02
2023	4.5	0.72	0.04
2024	6.6	0.70	0.03
2025	3.6	0.55	0.02

* Due to low water levels staff could not determine the NNC for 2015.

Chlorophyll-a

Water quality samples collected by Leon County are analyzed by Pace Analytical Services – Ormond Beach (Pace), with the analysis results provided back to the County for submission to FDEP. In June 2022, FDEP conducted a routine audit of the chlorophyll-a data. This audit revealed that from October 2014 through December 2020, the chlorophyll-a data was reported as "uncorrected chlorophyll-a" and not "corrected chlorophyll-a", as it should have been. Pace has since rectified this error and beginning in January 2021, the chlorophyll-a data were properly reported as "corrected chlorophyll-a". The laboratory provided Leon County with the "correct chlorophyll-a" data from the affected dates and the information in **Table 1** of this year's Report has been changed to reflect this. This has resulted in chlorophyll-a numbers that are lower than past Reports, which in turn has led to changes to the current Report's narrative.

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, Lake Weeks met the nutrient thresholds for the Big Bend Bioregion. Other water quality parameters appear to be normal for the area and no impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

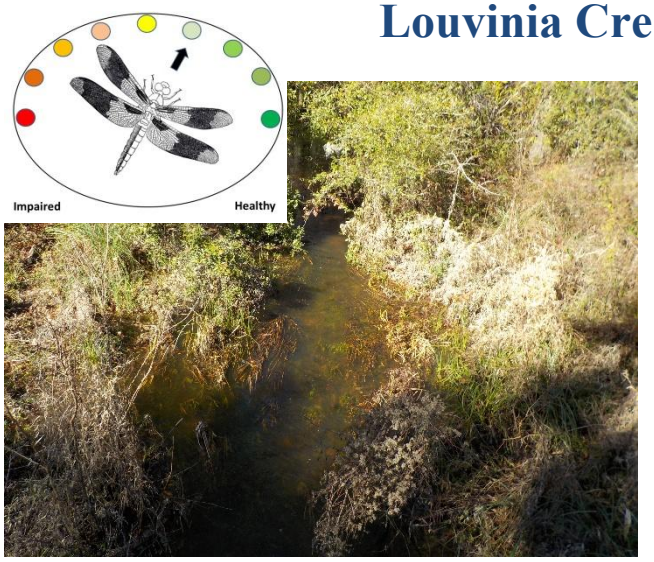
www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site LW1.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

Louvinia Creek EcoSummary



Louvinia Creek is an intermittently flowing creek located in eastern Leon County.

Approximately 44% of the 2,981-acre watershed is made up of agriculture, rangeland, transportation and utilities, urban and residential uses (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

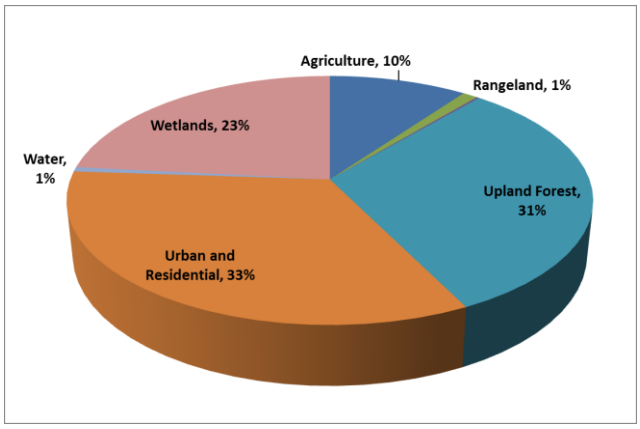


Figure 1. Louvinia Creek watershed land use.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Louvinia Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period.

Due to low water conditions and the ephemeral nature of the stream, four temporally independent samples per year have never been collected from this station. Based on the samples that were taken during the study period, most total phosphorus and total nitrogen values did not exceed their thresholds (**Figures 2 and 3**).

Other Parameters

Other water quality parameters appear to be normal for the area, and no impairments were noted.

Conclusions

While sampling requirements were not met to calculate the NNC results, most total phosphorus and total nitrogen levels appear to meet the nutrient thresholds. Other water quality parameters appear to be normal for the area, and no other impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site LC at WW.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

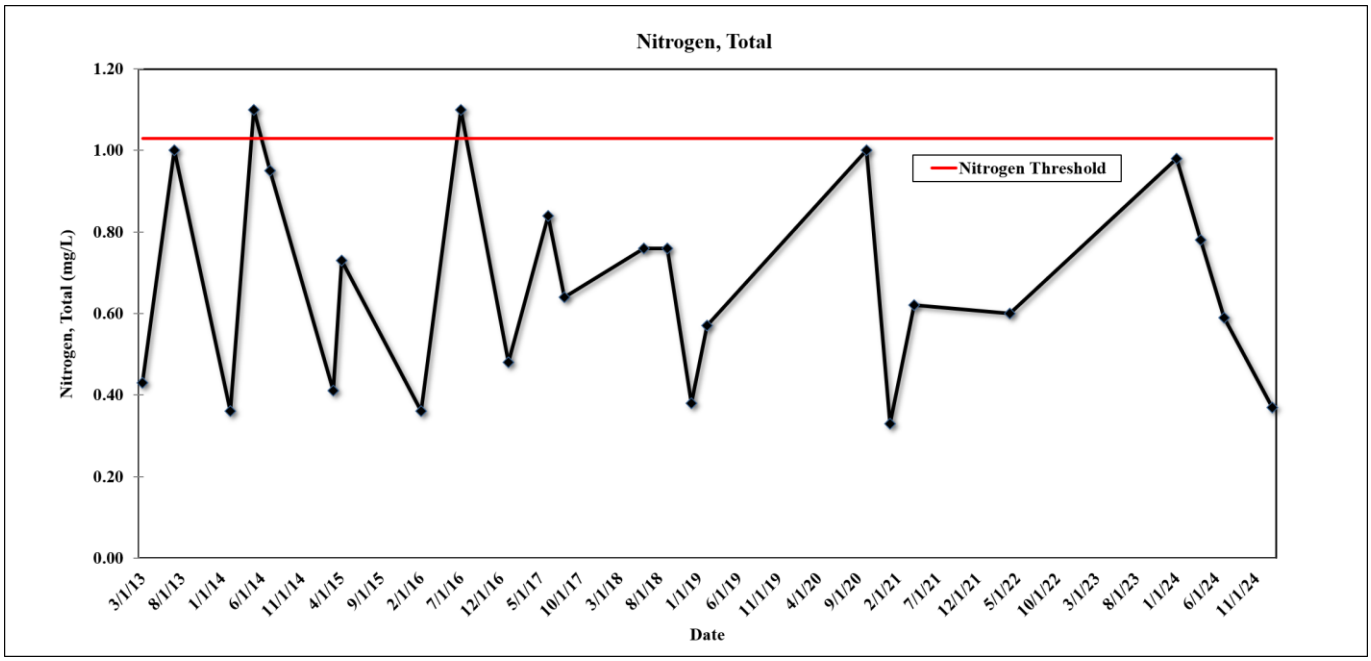


Figure 2. Total Nitrogen results for Louvinia Creek.

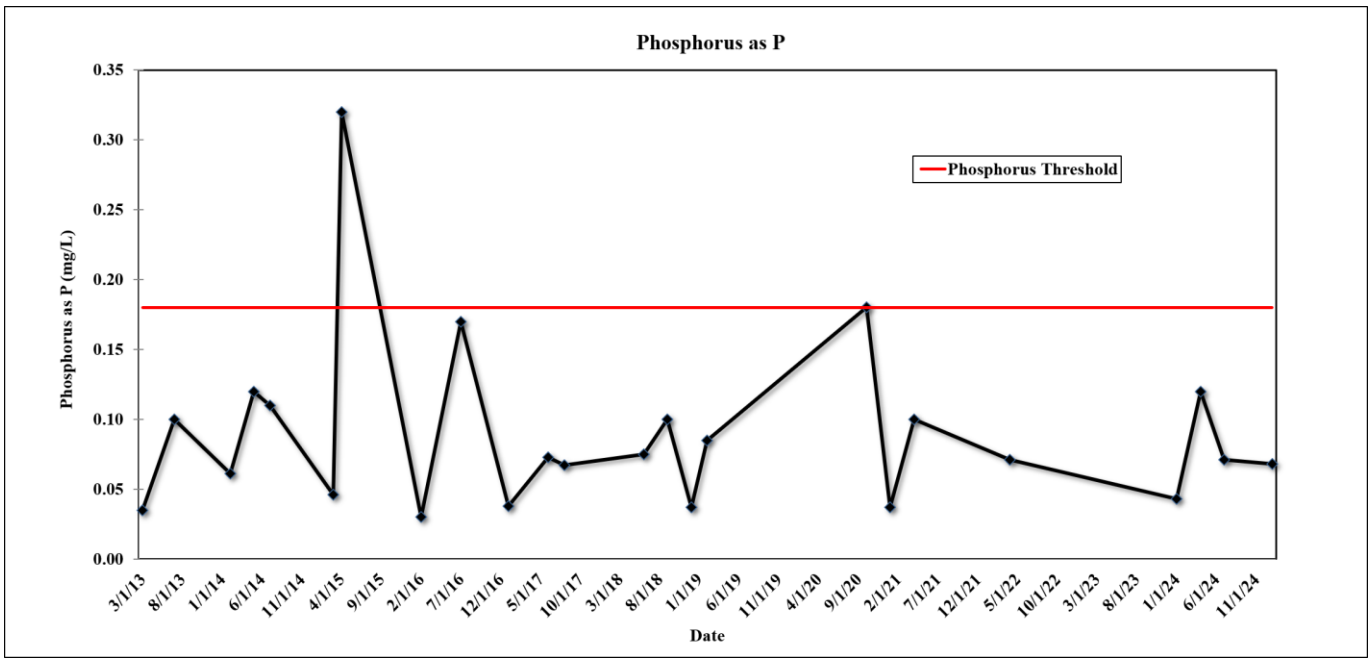
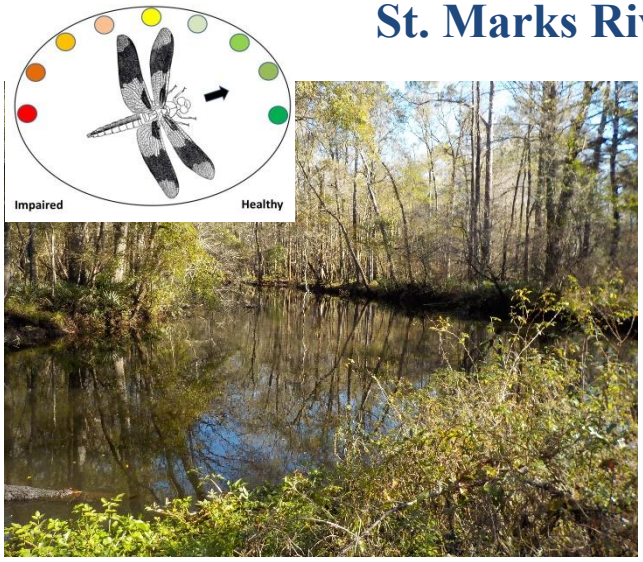


Figure 3. Total Phosphorus results for Louvinia Creek.

St. Marks River EcoSummary



The predominantly nitrogen-limited St. Marks River, declared an Outstanding Florida Water by the Florida Department of Environmental Protection (FDEP), originates in the hardwood and cypress swamps of the Red Hills area and flows approximately 35 miles south before emptying into Apalachee Bay. At Natural Bridge Road, the river disappears underground and reappears approximately a mile downstream. Elevated water levels can cause the St. Marks River and the Lake Lafayette series of lakes to interact.

Approximately 17% of land use in the 60,015-acre St. Marks Basin is agriculture, rangeland, transportation, utilities or urban and residential (as shown in **Figure 1**). Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

Background

Healthy, well-balanced stream communities may be maintained with some level of human activity, but excessive human disturbance may result in waterbody degradation.

Human stressors may include increased inputs of nutrients, sediments, and/or other contaminants from watershed runoff. Stressors can also include adverse hydrologic alterations, undesirable removal of habitat or riparian buffer vegetation, and introduction of exotic plants and animals. State water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life, fish consumption), and exceedances of these standards are associated with interference of the designated use.

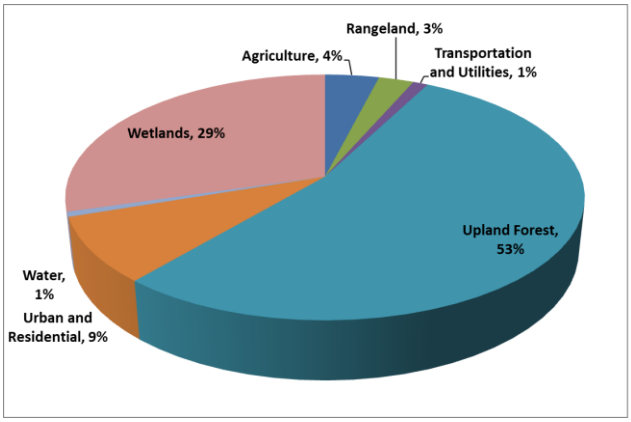


Figure 1. St. Marks watershed land use.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of the St. Marks River and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

The State of Florida uses Numeric Nutrient Criteria (NNC) to evaluate nutrients in waterbodies. NNC thresholds are set based on waterbody-specific characteristics and are used to determine if a waterbody meets water quality standards. The results of the four quarterly samples from a single year are used to calculate the annual geometric mean. According to FDEP requirements, the NNC threshold cannot be exceeded more than once in a three-year period. When viewing tables and figures, the absence of

data means there was not enough data collected to fulfill data requirements.

Nutrients

Natural Bridge Station

The nutrient thresholds and results are found in **Table 1**. The NNC has never been exceeded at the Natural Bridge station. The river was flooded during the April 2024 sampling event, so water quality samples were not collected for that quarter, resulting in NNC data requirements not being met for 2024.

Table 1. NNC thresholds and results for the St. Marks River at Natural Bridge Road.

St. Marks River	TN Threshold 1.03 mg/L	TP Threshold 0.18 mg/L
2006	0.39	0.03
2007	0.34	0.14
2008	0.27	0.04
2009	0.27	0.05
2010	0.58	0.05
2011	0.40	0.05
2012	0.43	0.05
2013	0.38	0.05
2014	0.49	0.05
2015	0.46	0.07
2016	0.39	0.03
2017	0.58	0.04
2018	0.63	0.05
2019	0.35	0.05
2020	0.43	0.06
2021	0.45	0.05
2022	0.43	0.05
2023	0.43	0.05
2024	-	-
2025	0.52	0.05

State Road 27 Station

The station located at State Road 27 was frequently dry or too low to sample and is not included in the aforementioned table since the State's data requirements could not be met. Even though staff could not collect the required number of samples, some conclusions can be made. Based on the samples taken during the study period, most total phosphorus and total nitrogen values did not exceed their respective thresholds (**Figures 2 and 3**).

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in the St. Marks River due to elevated levels of mercury.

Click here for more information about fish consumption advisories in Leon County.

Other Parameters

E. coli levels were moderately elevated (310/100 mL) during the 2025 1st quarter sampling event but did not exceed the 410/100 mL Class III water quality limit. Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, the St. Marks River met the NNC for the East Panhandle Region. While *E. coli* was moderately elevated during the 1st quarter sampling event, other water quality parameters appear to be normal for the area, and no impairments were noted.

Thank you for your interest in maintaining the quality of Leon County's water resources. Please feel free to contact us if you have any questions.

Contact and Resources for More Information

www.LeonCountyWater.org

Click here to access the results for all water quality stations sampled in 2025.

Click here for a map of the watershed – Sample Site 54 and St. Marks at 27.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

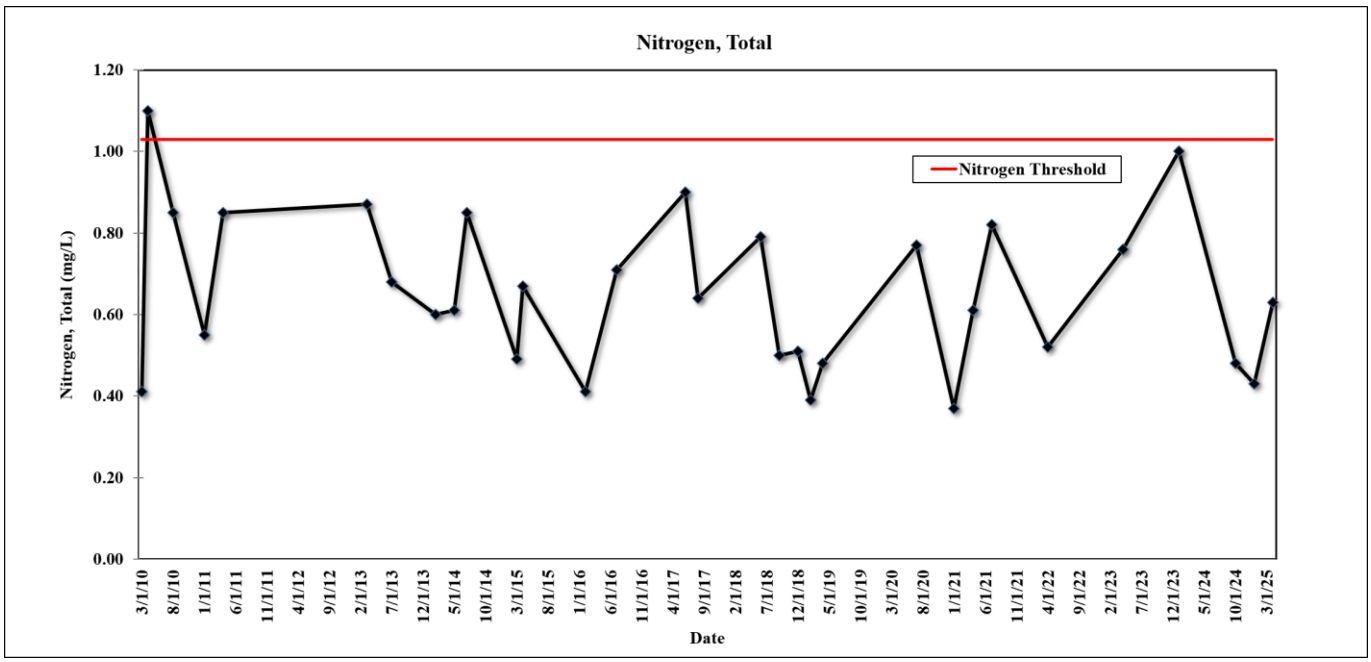


Figure 2. Total Nitrogen results for St. Marks River at 27.

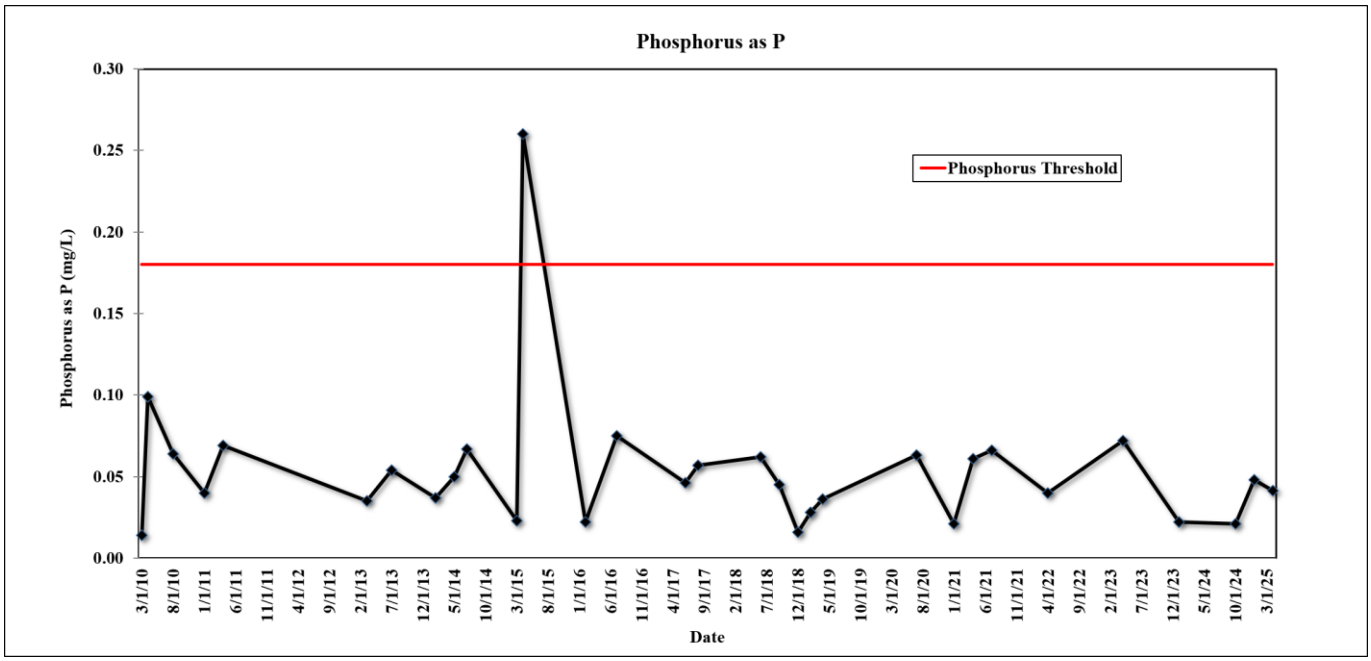


Figure 3. Total Phosphorus results for St. Marks River at 27.