

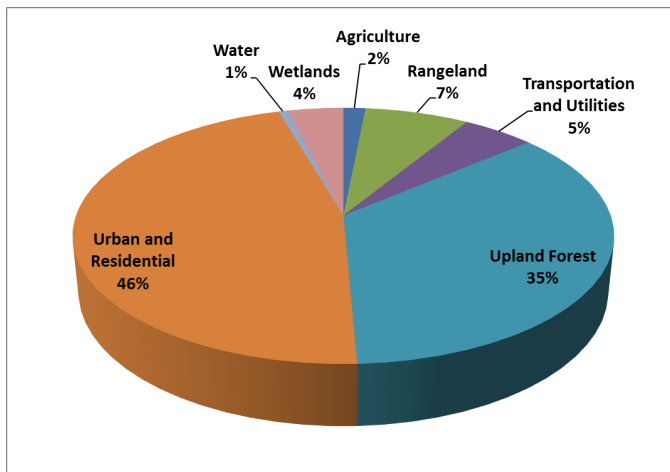
Waterbody: Lafayette Creek



Basin: Lake Lafayette

Lafayette Creek is a slightly tannic stream that flows north and drains into Upper Lake Lafayette. Station 1 (Sample site 65) is located on Apalachee Parkway, while Station 2 (LafayetteCreek3) is located further downstream where Lafayette Creek enters Upper Lake Lafayette.

As shown in the figure below, approximately 60% of land use acreage in the 1,860-acre watershed is agriculture, rangeland, transportation, utilities, urban and residential. 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, 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 to determine the health of Lafayette Creek and met 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, FDEP data requirements for the Numeric Nutrient Criteria (NNC) could not be met for 2010 through 2012 for Station 1 (Table 1) and were only met once (2021) at Station 2 since 2007. While the NNC have never exceeded the state criteria at Station 1, individual values were oftentimes above the protection criteria (Figures 1 and 2) with the latest occurring in July 30, 2020. Total nitrogen (1.5 mg/L) and chlorophyll-a (30.3 µg/L) results were extremely elevated when compared to other 2020 results. Recent rainfall (1.24 inches of rain was recorded at the Tallahassee Airport on July 28) suggests that elevated results were the result of nutrient laden stormwater runoff entering the system. The turbidity result (29.3 NTU) further collaborates that stormwater runoff was a

factor in the elevated levels of nitrogen and chlorophyll-a.

For illustrative purposes, individual data points were plotted for Station 2 to determine any possible trends (Figures 3 and 4). With only one exception in 2009 (phosphorus), individual values did not exceed the instream criteria for total nitrogen or total phosphorus. As was mentioned before, FDEP data requirements for the NNC were met in 2021 for Station 2. The geometric means for total nitrogen (0.27 mg/L) and total phosphorus (0.07 mg/L) values were well below the NNC criteria.

Table 1. FDEP's total nitrogen and phosphorus criteria for streams applied to Lafayette Creek.

Lafayette Creek Station 1	Total Nitrogen Threshold 1.03 mg/L	Total Phosphorus 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

Iron Bacteria

As mentioned in previous reports, the sediment in Station 1 has an orange/brown cast. This is the result of naturally occurring iron bacteria. Iron bacteria are a group of bacteria that grow by producing enzymes that promote chemical reactions involving iron within the water. After several reactions, the dissolved iron in the water converts into insoluble iron hydroxides, forming a brown/orange mass of gelatinous material that coats surfaces under the water. This

often occurs in streams that receive “seepage” from subsurface water flow. While it may appear unsightly, there is no evidence to suggest that it is harmful to human health, but there is a potential loss of animal habitat in the tributary due to the ferric iron precipitate covering existing habitat. The iron bacteria may also be contributing to the previously mentioned turbidity concern.

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 third (540 cfu) and fourth (720 cfu) quarters of 2021. Exceedances are possibly the result of residential development in the watershed and/or domestic or wild animals.

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.](#)

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 past sampling and remain somewhat an issue for

Lafayette Creek and could negatively affect the native creek fauna. *E. coli* levels at Station 2 exceeded Class III water quality standards during the third and fourth quarters of 2021. Exceedances are possibly the result of residential development in the watershed and/or domestic or wild animals. 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 2021.](#)

[Click here for a map of watershed – Sample Sites 65 and LafayetteCreek3.](#)

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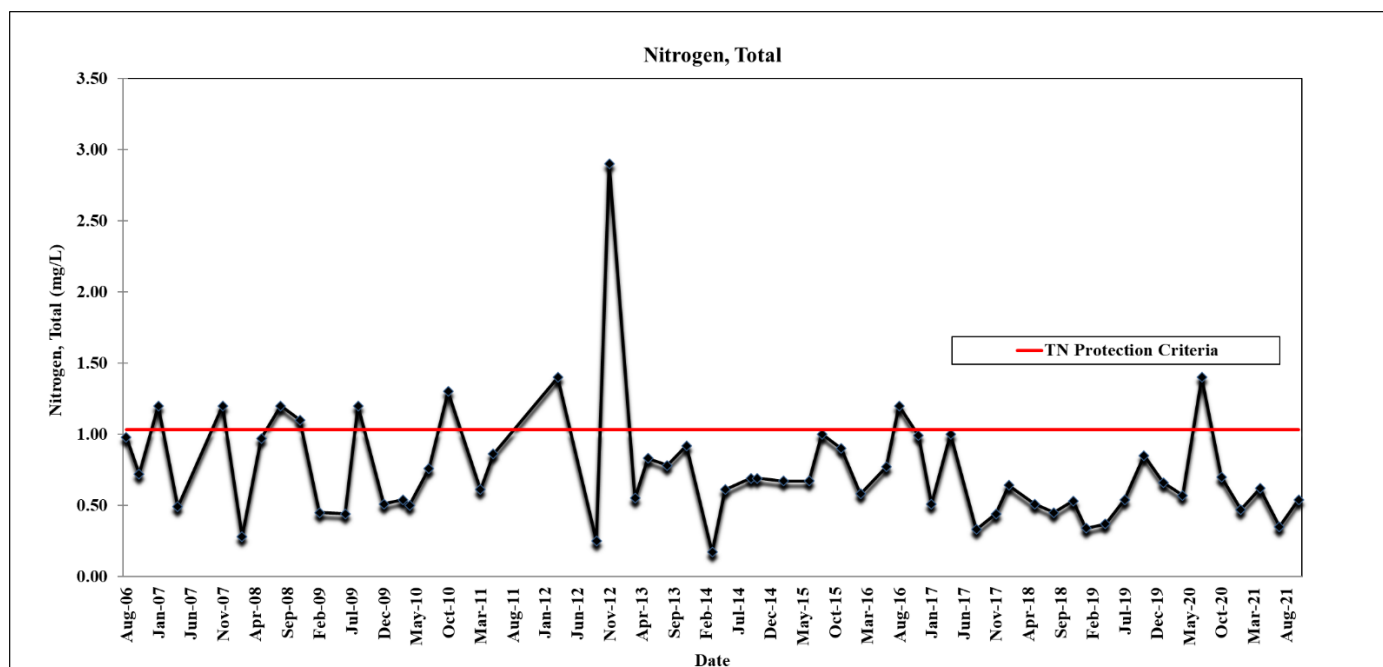


Figure 1. Total nitrogen results for Station 1 on Lafayette Creek.

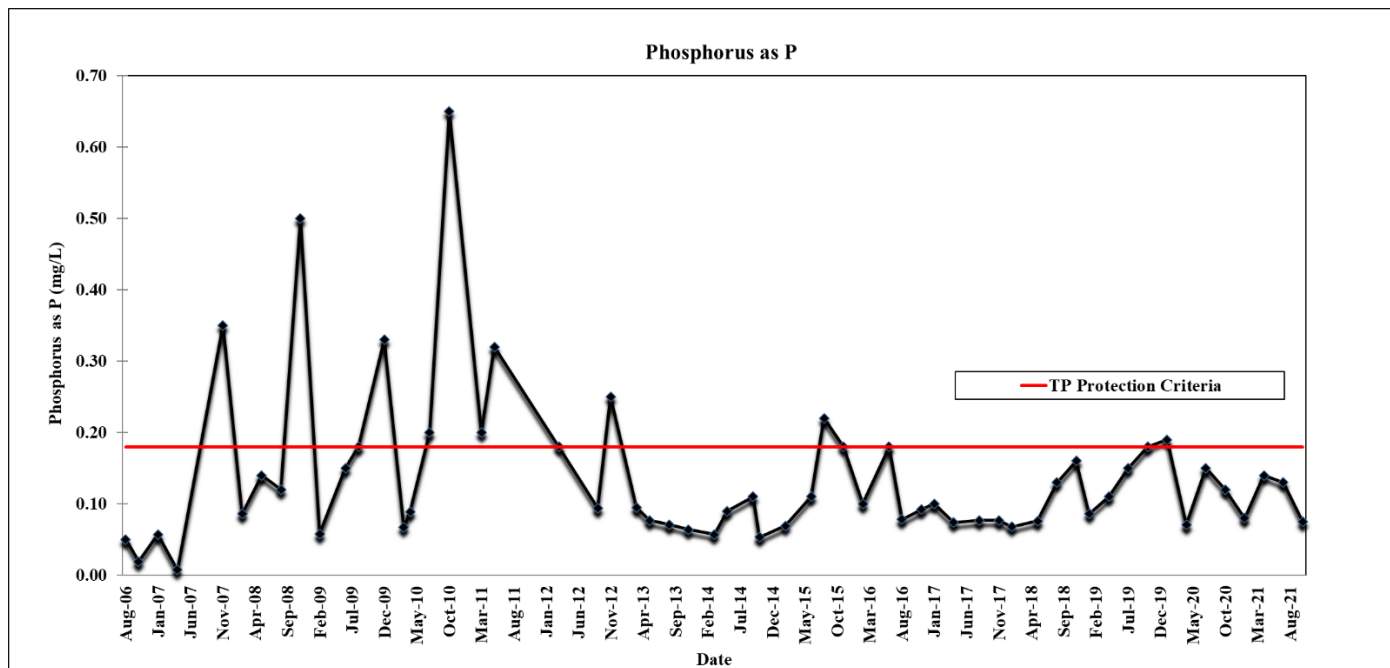


Figure 2. Total phosphorus results for Station 1 on Lafayette Creek.

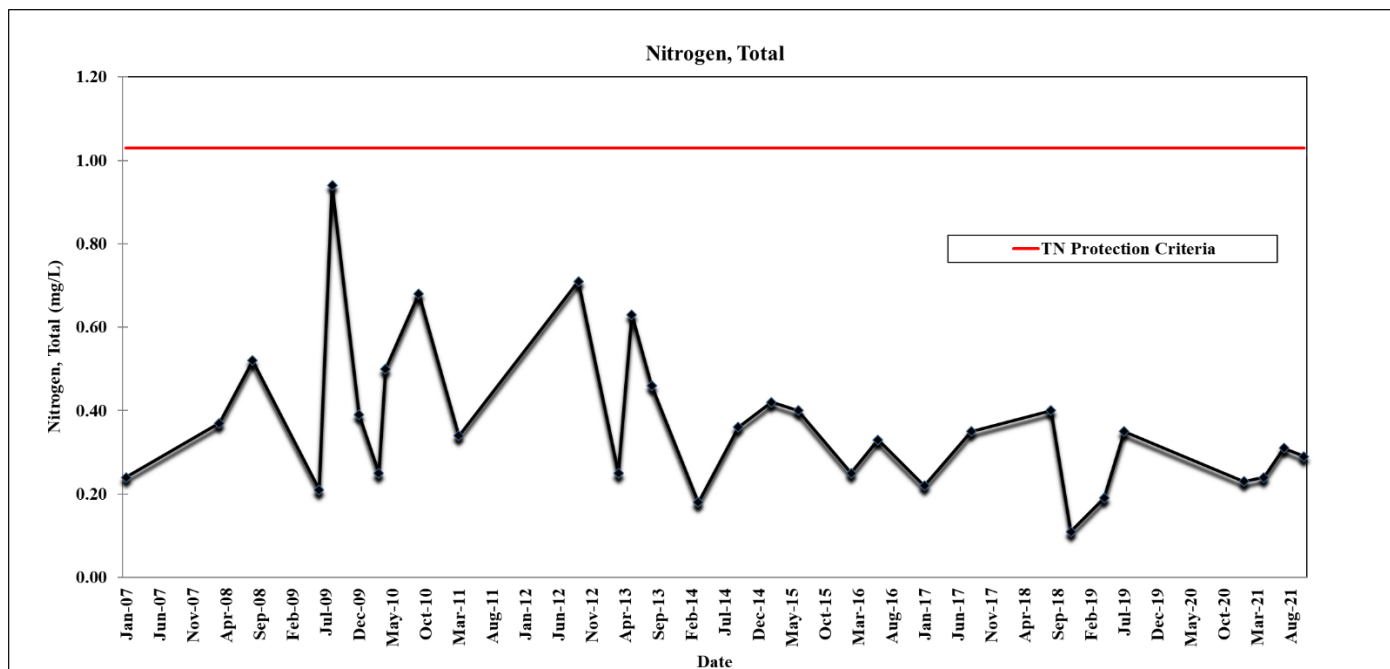


Figure 3. Total nitrogen results for Station 2 on Lafayette Creek.

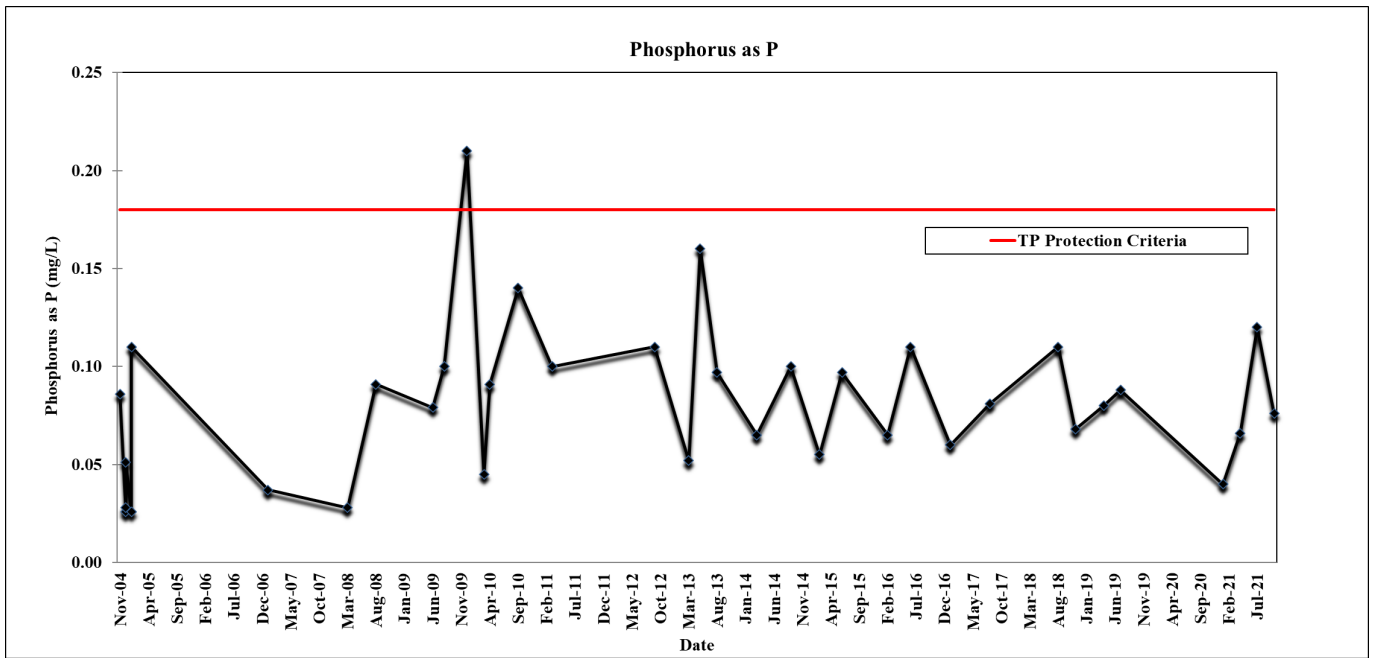


Figure 4. Total phosphorus results for Station 2 on Lafayette Creek.