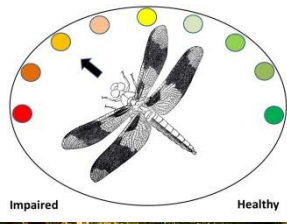


Lafayette Creek EcoSummary



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. Due to a lack of access to Station 1, this station will be replaced with a substitute station in a more accessible location.

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.

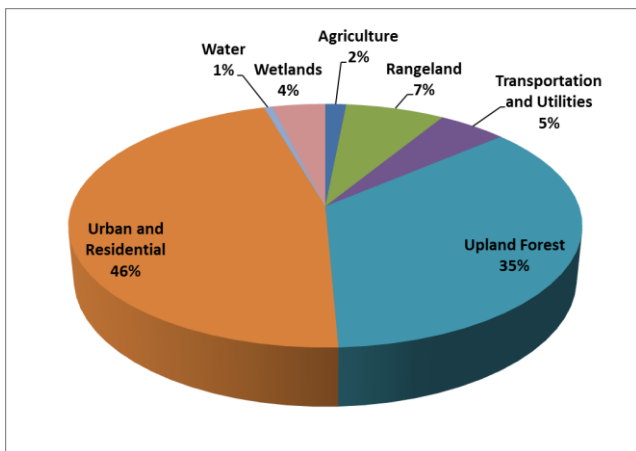


Figure 1. Lafayette Creek watershed land use.

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 were only met once (2021) at Station 2 since 2007. While the NNC never exceeded the state criteria at Station 1, individual values were occasionally above the criteria (**Figures 2 and 3**).

Table 1. NNC Thresholds and Sample Results for Lafayette Creek (Station 1).

| 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 | - | - |

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

For illustrative purposes, individual data points were plotted for Station 2 to determine any possible trends (**Figures 4 and 5**). With only two exceptions (for phosphorus), individual values did not exceed the instream criteria for Total Nitrogen or Total Phosphorus.

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 3rd (540 CFU) and 4th (720 CFU) quarters of 2021 as well as the 2nd (410 CFU) quarter of 2022. Exceedances are possibly the result of residential development in the watershed and/or domestic or wild animals.

Metals

Lafayette Creek (Station 65) exceeded Class III water quality criteria for lead during the 1st quarter. Relict anthropogenic sources such as leaded gasoline are most likely to be the cause of the lead exceedance.

[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.](#)

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 several times over the sampling period. 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 2023.](#)

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

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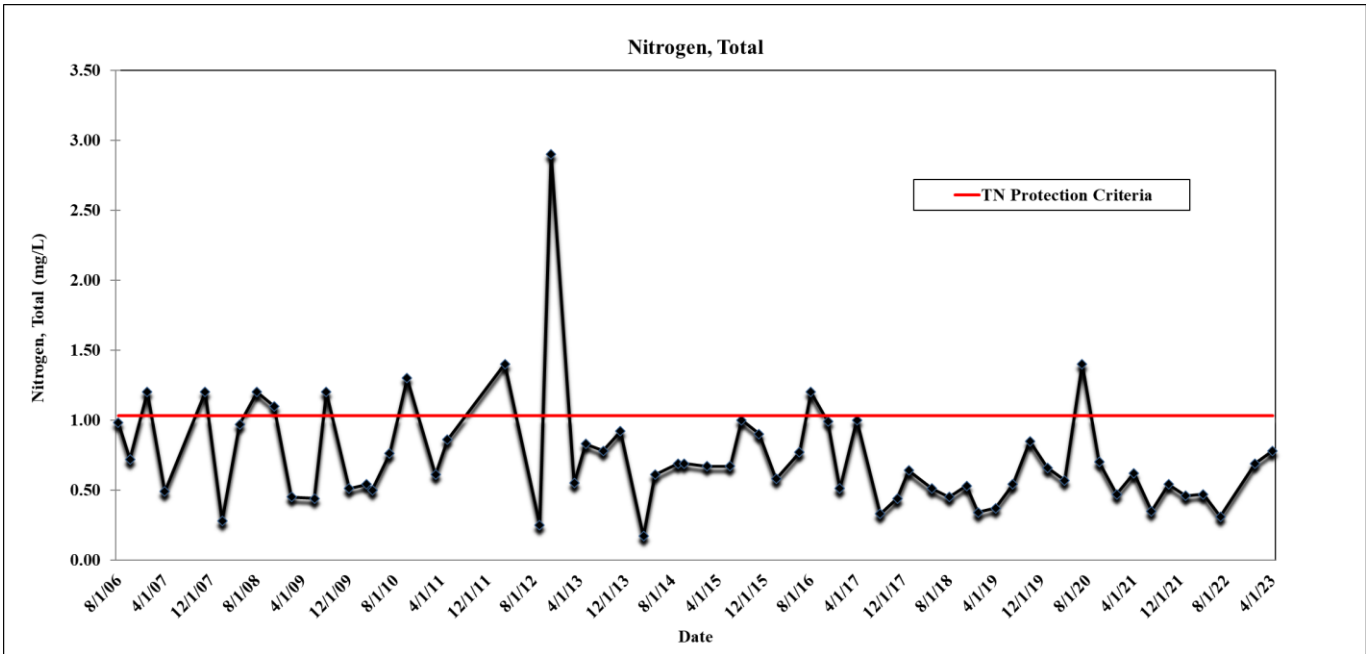


Figure 2. Total Nitrogen results for Station 1 on Lafayette Creek.

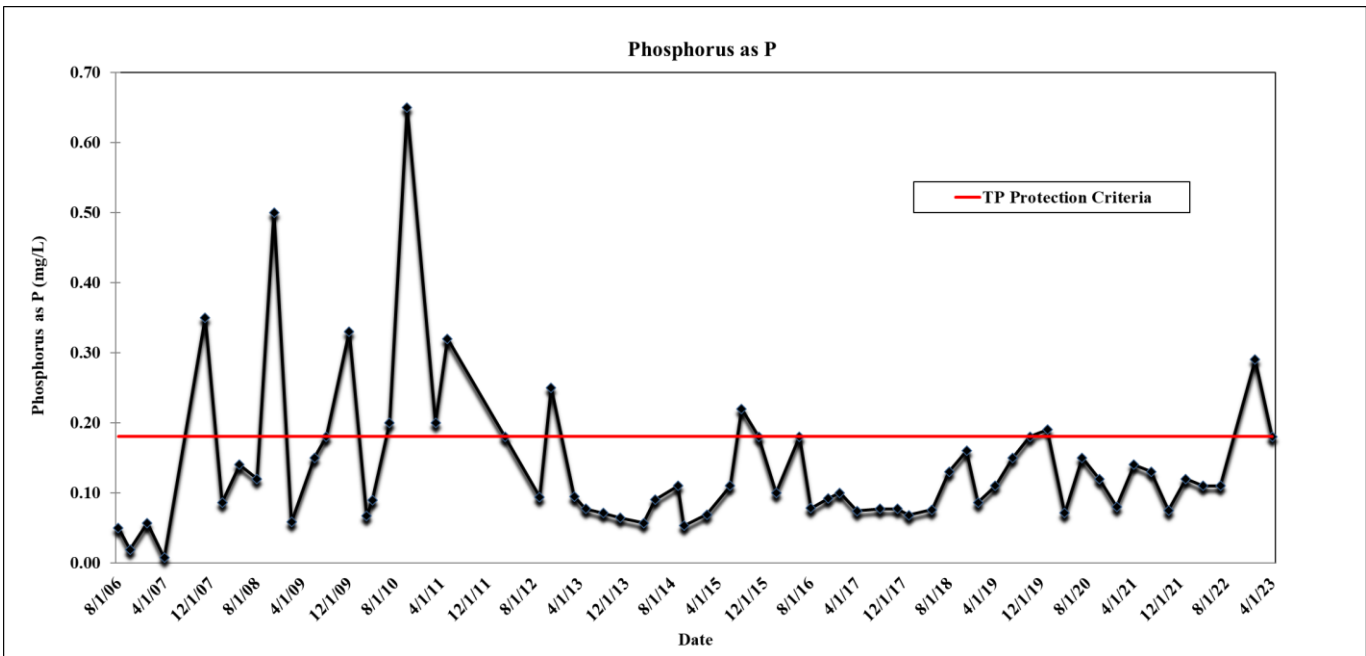


Figure 3. Total Phosphorus results for Station 1 on Lafayette Creek.

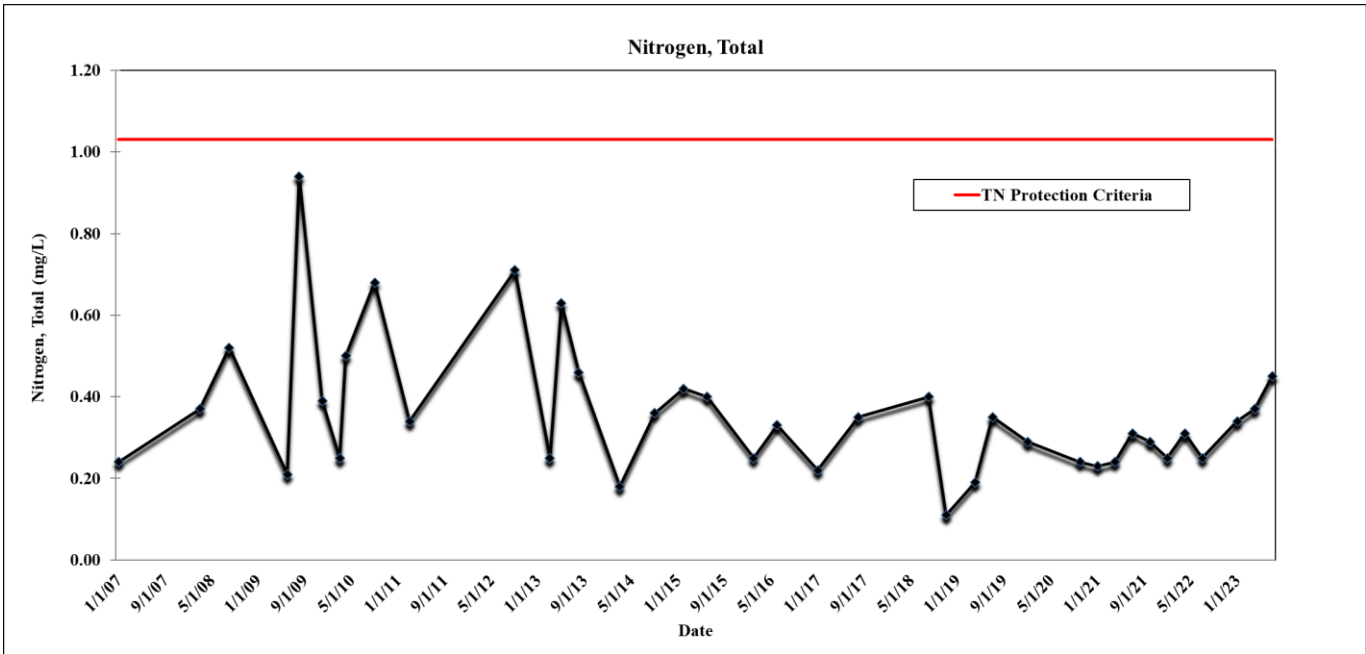


Figure 4. Total Nitrogen results for Station 2 on Lafayette Creek.

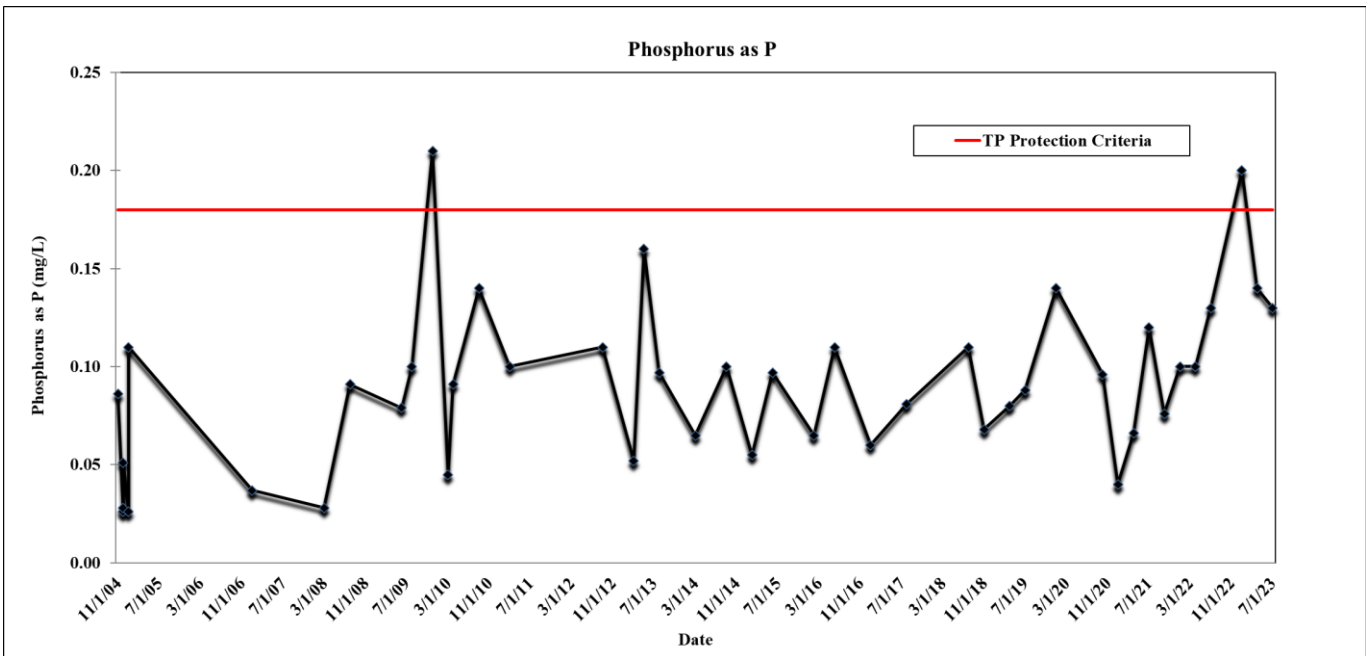


Figure 5. Total Phosphorus results for Station 2 on Lafayette Creek.