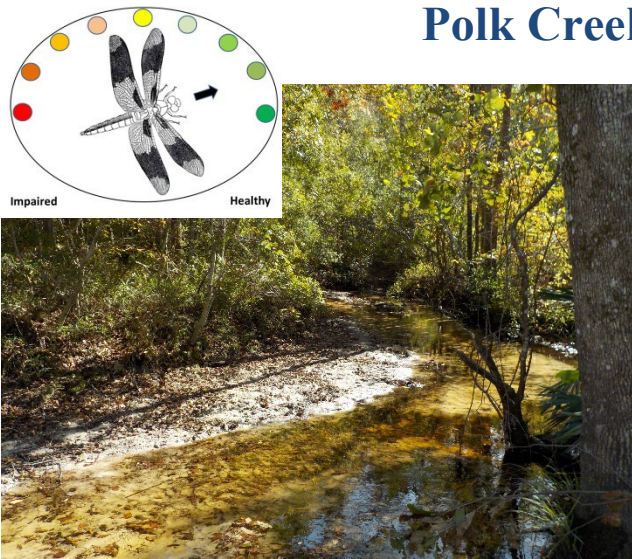


Polk Creek EcoSummary



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.

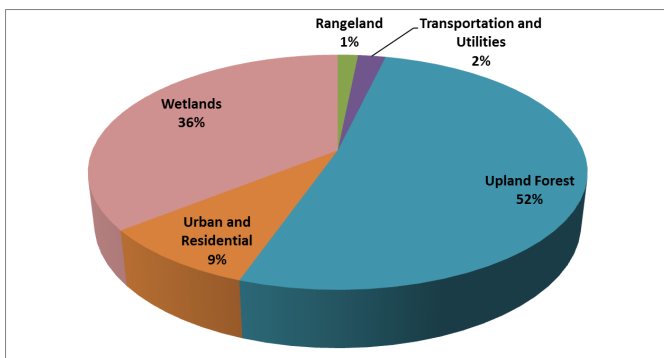


Figure 1. Polk Creek watershed land use.

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). Leon County also conducted a biological survey in 2021 to evaluate the health of aquatic invertebrate communities in Polk Creek. 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.

| Polk Creek | 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 |

*Due to low water levels, the NNC data requirements were not met and could not be calculated for 2011.

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 in 2021 (**Figure 2**). The latest *E. coli* exceedances were noted during the 3rd quarter of 2022 at station 38 (**Figure 3**).

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

The HA score (**Table 2**) for Polk Creek characterize the stream habitat in the low Optimal category. Channel characteristics were

natural with the expected pools, bends, and stable stream banks, but with some increases in sedimentation since the 2019 event. On the sampling date, turbidity was slightly elevated, likely because of recent rains. The SCI categorical score (**Table 3**) was Healthy and comparable to previous events.

Table 2. Polk Creek Habitat Assessment Score.

| Polk Creek | Score | Category |
|---------------------------------------|----------------|---------------------|
| Substrate Diversity | 14 | Suboptimal |
| Substrate Availability | 10 | Marginal |
| Water Velocity | 17 | Optimal |
| Habitat Smothering | 19 | Optimal |
| Artificial Channelization | 20 | Optimal |
| Bank Stability | 9, 9 | Optimal, Optimal |
| Riparian Zone Width | 10, 10 | Optimal, Optimal |
| Riparian Vegetation Quality | 10, 10 | Optimal, Optimal |
| Final Habitat Assessment Score | 138 | |
| Interpretation | Optimal | |

The macroinvertebrate community present at the monitoring site consisted of 43 taxa, including 14 sensitive taxa and one very tolerant taxa. No single group or taxon exerted an overwhelming numerical dominance of the community, although stoneflies, mayflies and blackflies were each well represented. Sensitive taxa contributed 33% of the total richness and accounted for 70% of all individuals in the SCI sample. Included in the sensitive taxa are two taxa of ephemeroptera (mayflies), two taxa of plecoptera (stoneflies) and one species of trichoptera (caddisflies). Six long-lived taxa were recovered from the SCI. Ephemeroptera, Plecoptera, Trichoptera (EPT) taxa are widely regarded as the groups of aquatic insects that contain large numbers of pollution sensitive taxa. In total, seven EPT taxa were

recovered in the SCI; two ephemeropteran taxa, two plecopteran taxa and three trichopteran taxa.

Table 3. Polk Creek SCI Score.

| Polk Creek | Rep 1 | Rep 2 |
|--|----------------|-------|
| Stream Condition Index Metrics Scores | | |
| Total Taxa | 5 | 5 |
| Ephemeroptera Taxa | 2.5 | 2.5 |
| Trichoptera Taxa | 2.22 | 1.11 |
| % Filter Feeder | 3.15 | 3.55 |
| Long-lived | 8 | 10 |
| Clinger Taxa | 7 | 7 |
| % Dominance | 8.14 | 8.53 |
| % Tanytarsini Taxa | 4.92 | 7.05 |
| Sensitive Taxa | 6.67 | 6.00 |
| % Tolerant Taxa | 8.51 | 7.46 |
| SCI Vial Score | 62.33 | 64.67 |
| Stream Condition Index Score | 63.50 | |
| 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 other impairments were noted.

Conclusions

E. coli exceedances continue to be a problem at both stations. Nutrient thresholds were met for the Big Bend Bioregion. The results of the Habitat Assessment score characterize the stream habitat in the Optimal category. In keeping with the habitat assessment and the water quality, the SCI score was Healthy. 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 2022.](#)

[Click here for a map of the watershed – Sample Sites 38 and PK1.](#)

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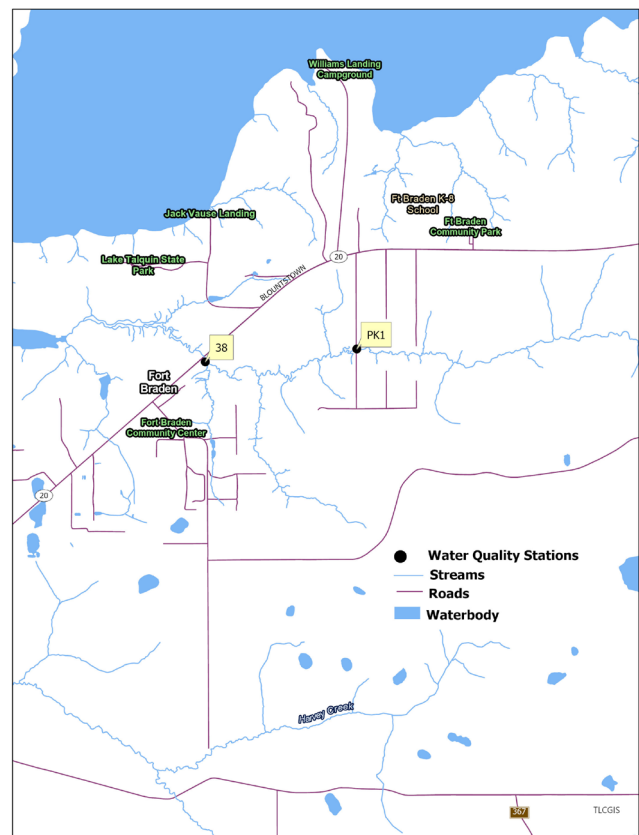


Figure 2. Locations of the Water Quality Station 38 and the newly established PK1 on Polk Creek.

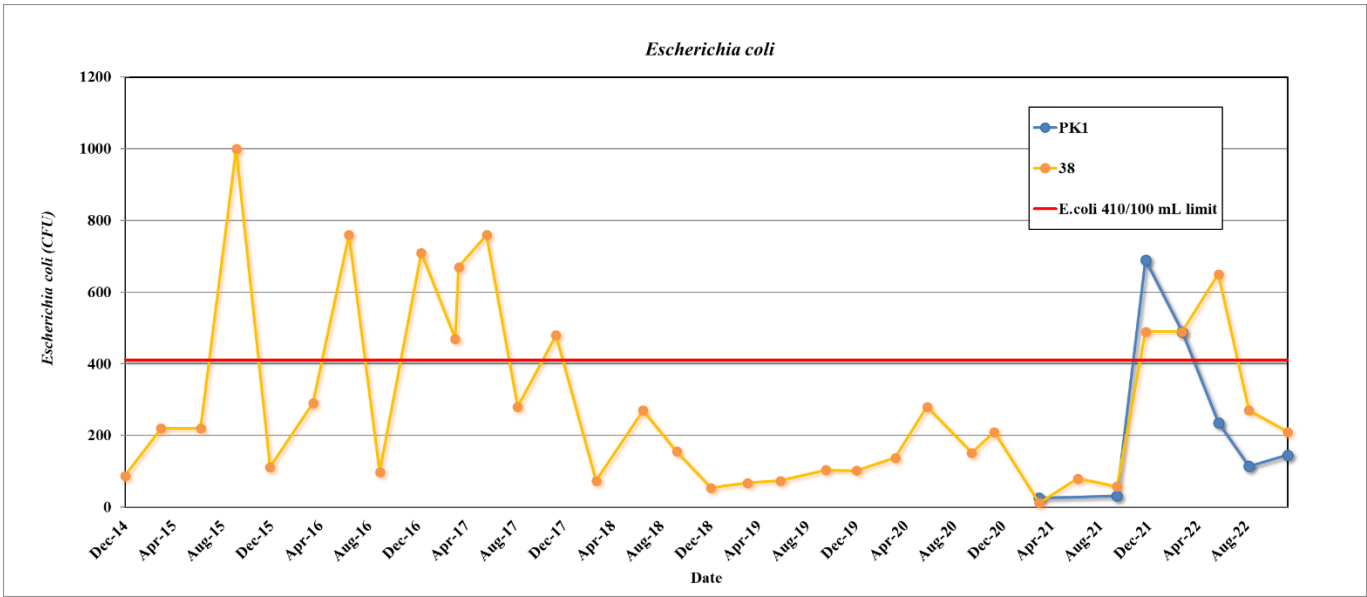


Figure 3. *E. coli* levels for Polk Creek.