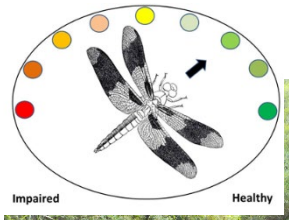
West Black Creek EcoSummary



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**).

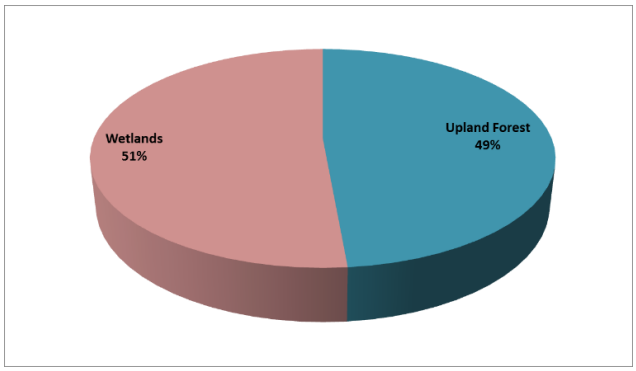


Figure 1. West Black Creek watershed land use.

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

*Due to high water levels, the NNC data requirements were not met and could not be calculated for 2021.

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

The results of the HA score (**Table 2**) characterize the stream habitat in the Optimal category. Habitat availability consisted of high-quality roots and snags, fair quality leaf mats, and just enough rock material to make a major habitat. The 100 meters transect channel characteristics were very natural, with the expected pools, bends, and stable streambanks.

The SCI score (**Table 3**) was Exceptional. The macroinvertebrate community present at the monitoring site exhibited a taxa richness of 59 and displayed 22 sensitive taxa. No single group or taxon numerically dominated the community. Both long-lived and sensitive taxa were well represented in the SCI sample with 10.2% of taxa being long-lived (six taxa) and 37.3% being sensitive (22 taxa). Included in the sensitive taxa are five taxa of ephemeroptera (mayflies), three taxa of plecoptera (stoneflies), and four taxa of trichoptera (caddisflies). The Ephemeroptera/Plecoptera/Trichoptera (EPT) taxa are widely regarded as the groups of aquatic insects that contain large numbers of pollution sensitive taxa. In total, 21 EPT taxa were recovered in the SCI; seven ephemeropteran taxa, three plecopteran taxa and 11 trichopteran taxa.

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

Table 2. West Black Creek Habitat Assessment Score.

West Black Creek	Score	Category
Substrate Diversity	17	Suboptimal
Substrate Availability	11	Suboptimal
Water Velocity	20	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	9, 9	Optimal, Optimal
Final Habitat Assessment Score	**143**	
Interpretation	**Optimal**	

Table 3. West Black Creek Stream Condition Index Score.

West Black Creek	Rep 1	Rep 2
Stream Condition Index Metrics Scores		
Total Taxa	8.57	7.86
Ephemeroptera Taxa	5.00	6.25
Trichoptera Taxa	10.00	6.67
% Filter Feeder	1.55	1.47
Long-lived Score	10	10
Clinger Taxa	8	10
% Dominance	9.44	9.11
% Tanytarsini Taxa	4.87	5.49
Sensitive Taxa	9.33	10.00
% Tolerant Taxa	8.53	8.42
SCI Vial Score	83.66	83.62
Stream Condition Index Score	**83.64**	
Score Interpretation	**Exceptional**	

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 never exceeded since *E. coli* sampling began (**Figure 2**).

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 no *E. coli* exceedances since *E. coli* sampling began in 2015. The SCI score is in the Exceptional category, while the Habitat Assessment score characterizes the stream habitat as Optimal. 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 Site 43.

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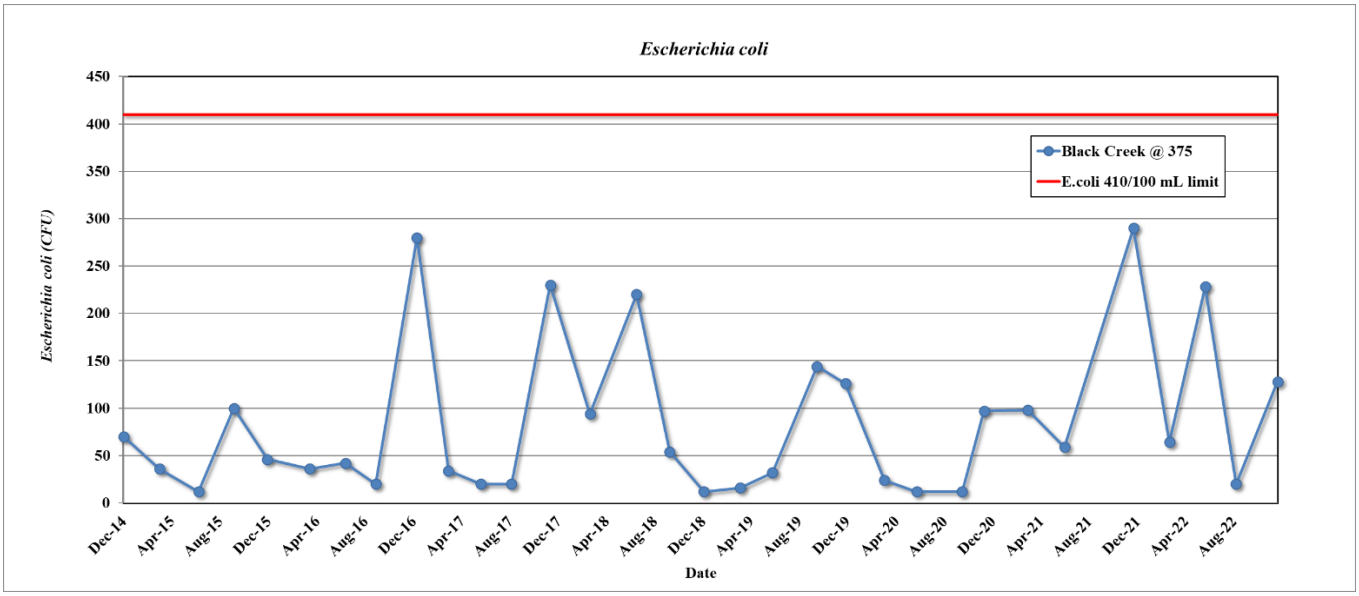

Figure 2. West Black Creek *Escherichia coli* results.