Waterbody: West Black Creek



Basin: Ochlockonee River

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.

As the following pie chart shows, upland forest and wetlands make up the entirety of the 11,237-acre watershed upstream of the sample station.



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. 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 sampling was conducted to determine the health of Black Creek and met the collection and analysis requirements of FDEP.

Results

Nutrients

The nutrient thresholds and results are found in Table 1. According to FDEP requirements, Numeric Nutrient Criteria (NNC) for phosphorus and nitrogen (expressed as an annual geometric mean) cannot be exceeded more than once in a three-year period. While the State criteria were not exceeded for either parameter, the 2018 nitrogen level was the highest recorded during the period of record. Due to the stream being flooded out of its banks during the 3rd quarter of 2021, water quality samples were not collected. Based on three samples, total nitrogen (0.25 mg/L) and total phosphorus (0.02 mg/L) were below FDEP's nutrient thresholds.

West Black Creek 1.03 mg/L		Total Phosphorus 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	-	-	

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

Fecal Coliforms and Escherichia 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 1).

Biology

Stream Condition Index and Habitat Assessment

The Stream Condition Index (SCI) sampling is not performed every year, so the following results are from 2019.

The Stream Condition Index score at West Black Creek (31) is in the Exceptional category.

A total of 47 taxa were collected from West Black Creek during the SCI sampling. No single group or taxon numerically dominated the community. The riffle beetle Microcylloepus pusillus was the most abundant single taxon in both vials of the SCI. Both long-lived and sensitive taxa were well represented in the SCI sample with 21.3% of taxa being long-lived (10 taxa) and 36.2% being sensitive (17 taxa). Included in the sensitive taxa are four taxa of ephemeroptera (mayflies), two taxa of plecoptera (stoneflies), and three taxa of trichoptera (caddisflies). These three EPT taxa are widely regarded as the groups of aquatic insects that contain a large number of pollution sensitive taxa. In total, seventeen EPT taxa were recovered in the SCI; four ephemeropteran taxa, two plecopteran taxa and eleven trichopteran taxa.

The results of the Habitat Assessment score characterize the stream habitat in the Optimal category. Habitat availability, although suboptimal, presented high quality leaf packs, roots and snags. The 100-meter transect channel characteristics were very natural, with the expected pools, bends, and stable streambanks. In keeping with the habitat assessment and the water quality that exhibited adequate dissolved oxygen concentration, low conductivity, and low turbidity, the Stream Condition Index score was Exceptional.

For more information on the Stream Condition Index and Habitat Assessment, click here.

Conclusions

Based on ongoing sampling, West Black Creek met the nutrient thresholds 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 2019 SCI score is in the Exceptional category, while the Habitat Assessment score characterizes the stream habitat at 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.

	Table 2. West	Black Creek Stream	Condition Index Score.
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West Black Creek	Rep 1	Rep 2
Stream Condition Index Metrics		
Total Taxa	5.71	6.43
Ephemeroptera Taxa	5	5
Trichoptera Taxa	10	7.78
% Filter Feeder	4.29	3.35
Long-lived Score	10	10
Clinger Taxa	8	10
% Dominance	6.85	7.88
% Tanytarsini Taxa	5.01	3.91
Sensitive Taxa	8.67	8.67
% Tolerant Taxa	10	7.54
SCI Vial Score	81.70	78.40
Stream Condition 80.05		.05
Score Interpretation	Exceptional	

Table 3. West Black Creek Habitat Assessment Score.	
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West Black Creek	Score	Category
Substrate Diversity	15	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	141	
Interpretation	Optimal	

Contact and resources for more information

www.LeonCountyWater.org

<u>Click here to access the results for all water quality</u> <u>stations sampled in 2021.</u>

<u>Click here for a map of the watershed – Sample Site</u> <u>43.</u>

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Figure 1. West Black Creek fecal coliforms and Escherichia coli.