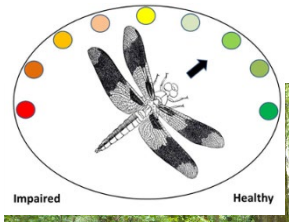
Northeast Black Creek EcoSummary



Northeast Black Creek is a tannic, acidic, predominantly nitrogen-limited stream located in northeastern Leon County. The stream forms near Centerville Road and the Chemonie Plantation subdivision and flows southeast through the Miccosukee Land Cooperative before crossing under Capitola Road. The creek then turns northeast to join Still Creek and then flows into Bird Sink.

Approximately 31% of the 15,783-acre watershed is comprised of urban, agriculture, rangeland, transportation, and utilities land uses (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

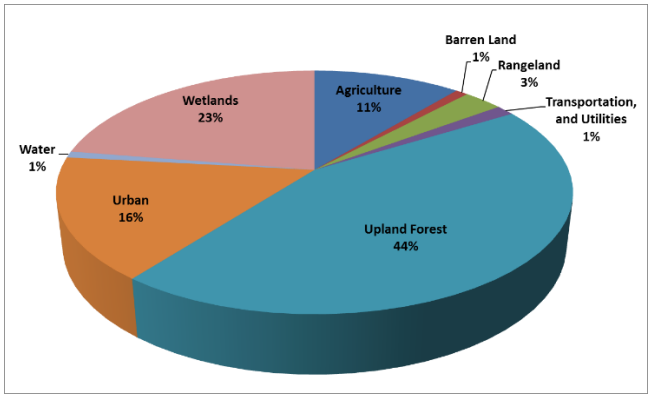


Figure 1. Bird Sink/Northeast Black Creek watershed land use.

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.

Methods

Surface water samples are collected quarterly (as field conditions allow). This information is used to determine the health of Black Creek and meets the requirements of the Florida Department of Environmental Protection (FDEP).

Results

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, four temporally independent samples per year could not always be collected. When viewing tables and figures, the

absence of data means there was not enough data collected to fulfill data requirements.

Due to ongoing beaver activity, station BC1 is no longer sampled. Leon County staff continue to evaluate the hydrological and plant community changes that are occurring in this section. Station BC2 was relocated and is now called BC2M.

Nutrients

The nutrient thresholds and results are found in **Tables 1 and 2**. The NNC has never been exceeded during the period of record.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 2 and 3**). With few exceptions, individual values did not exceed the instream criteria for total phosphorus or total nitrogen. Elevated nutrient values during the 2nd quarter of 2020 and the 3rd quarters of 2021 and 2022 were the result of localized rainfall events that occurred before the sampling events. The associated runoff pushed nutrient laden material into the stream, causing a temporary increase in nutrients.

Table 1. Total phosphorus criteria and results for Northeast Black Creek.

Northeast Black Creek	Instream Protection Criteria TP (0.18 mg/L)			
Year	**BC1**	**BC2M**	**BC3**	**BC4**
2006	-	-	-	-
2007	0.18	-	-	-
2008		-	-	-
2009	0.08	-	0.07	0.06
2010	0.08	-	-	-
2011-2012	-	-	-	-
2013	0.08	0.09	0.07	0.07
2014	-	-	-	-
2015	-	-	0.06	-
2016-2017	-	-	-	-
2018	-	-	0.07	0.03
2019	-	-	-	-
2020	-	0.08	-	-
2021-2022	-	-	-	-

Table 2. Total nitrogen criteria and results for Northeast Black Creek.

Northeast Black Creek	Instream Protection Criteria TN (1.03 mg/L)			
Year	**BC1**	**BC2M**	**BC3**	**BC4**
2006	0.36	-	-	-
2007	-	-	-	-
2008	-	-	-	-
2009	0.27	-	0.69	0.72
2010	0.41	-	-	-
2011-2012	-	-	-	-
2013	0.40	0.71	0.61	0.47
2014	-	-	-	-
2015	-	-	0.66	-
2016-2017	-	-	-	-
2018	-	-	0.64	0.68
2019	-	-	-	-
2020	-	0.78	-	-
2021-2022	-	-	-	-

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples collected over a thirty-day period was exceeded several times at stations BC2M, BC3 and BC4 (**Figure 4**). Based on anthropogenic land use, FDEP considers the exceedances possibly the result of residential development in the watershed (e.g., improperly functioning septic tanks). Other causes could be wild animals and/or agriculture.

Dissolved Oxygen

As **Figure 5** shows, Northeast Black Creek stations occasionally did not meet the Class III criteria for dissolved oxygen (DO). Staff believes that this is a natural condition for this location, since the creek is a low gradient blackwater stream that drains wetlands.

Biochemical Oxygen Demand (BOD)

BOD levels were elevated at stations BC2M (5.5 mg/L) and BC3 (3.0 mg/L) during the 2nd quarter sampling event in 2021. Other water quality parameters taken at station BC3 were typical of the stream, so it is unknown why the BOD level

was elevated. However, along with an elevated BOD level at station BC2M, the pheophytin result (31.1 µg/L) was elevated at the station as well. Pheophytin (a degradation product of chlorophyll) can contribute to higher levels of BOD.

Other Parameters

Other water quality parameters appear to be normal for the area and no impairments were noted.

Conclusions

Based on ongoing sampling, Northeast Black Creek met, with few exceptions, the NNC thresholds for the East Panhandle Region. Occasionally the stations did not meet the Class III criteria for DO. This is the result of normally low DO in low gradient, wetland fed systems like this stream. The *E. coli* water quality limit was exceeded several times during the period of record.

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 2022.

Click here for a map of the watershed – Sample Stations BC2M, BC3 and BC4.

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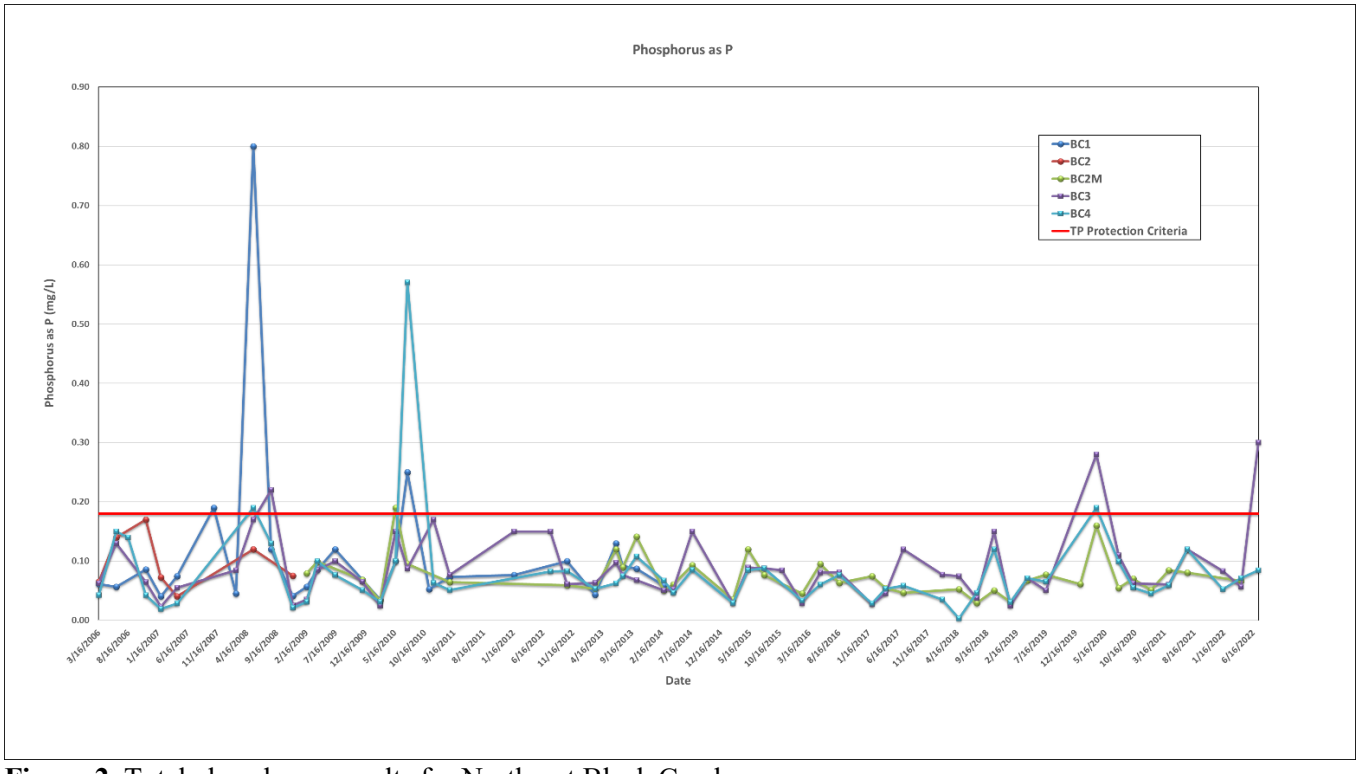

Figure 2. Total phosphorus results for Northeast Black Creek.

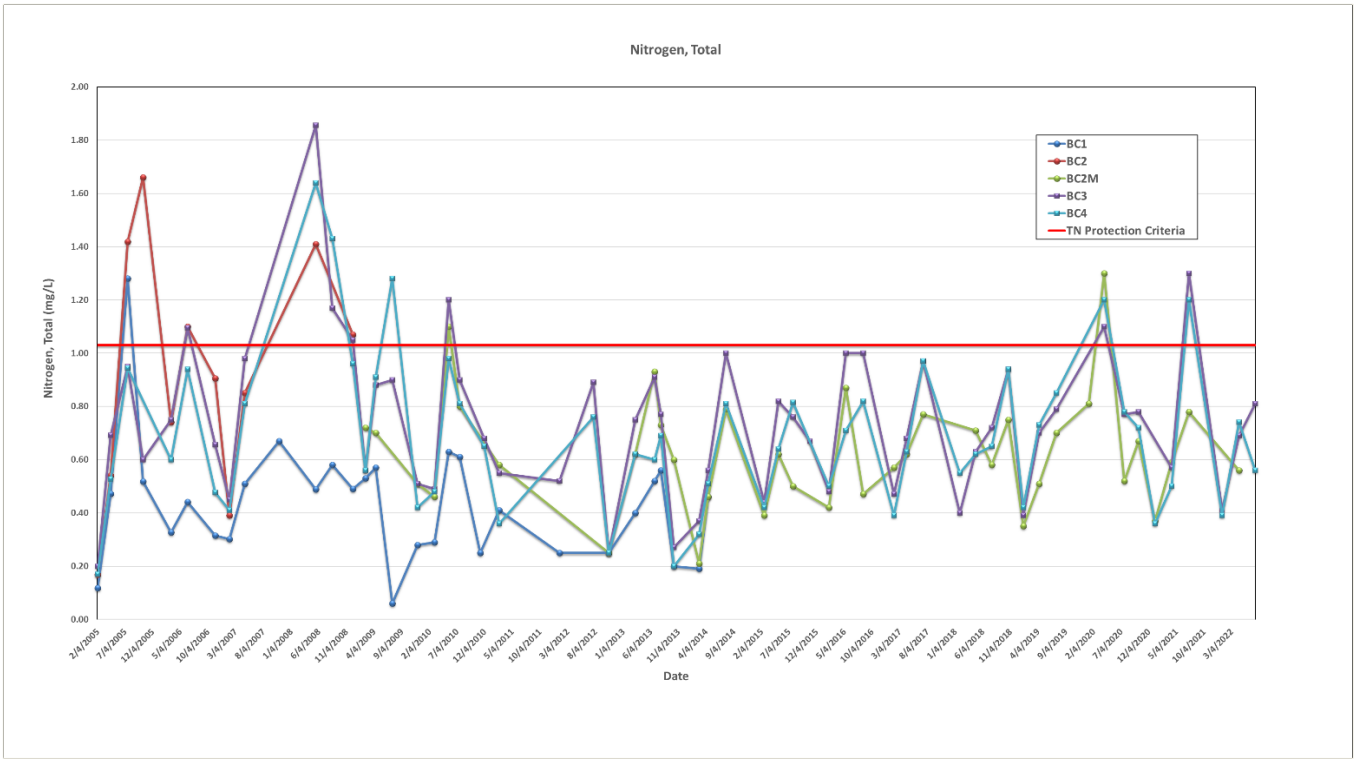

Figure 3. Total nitrogen results for Northeast Black Creek.

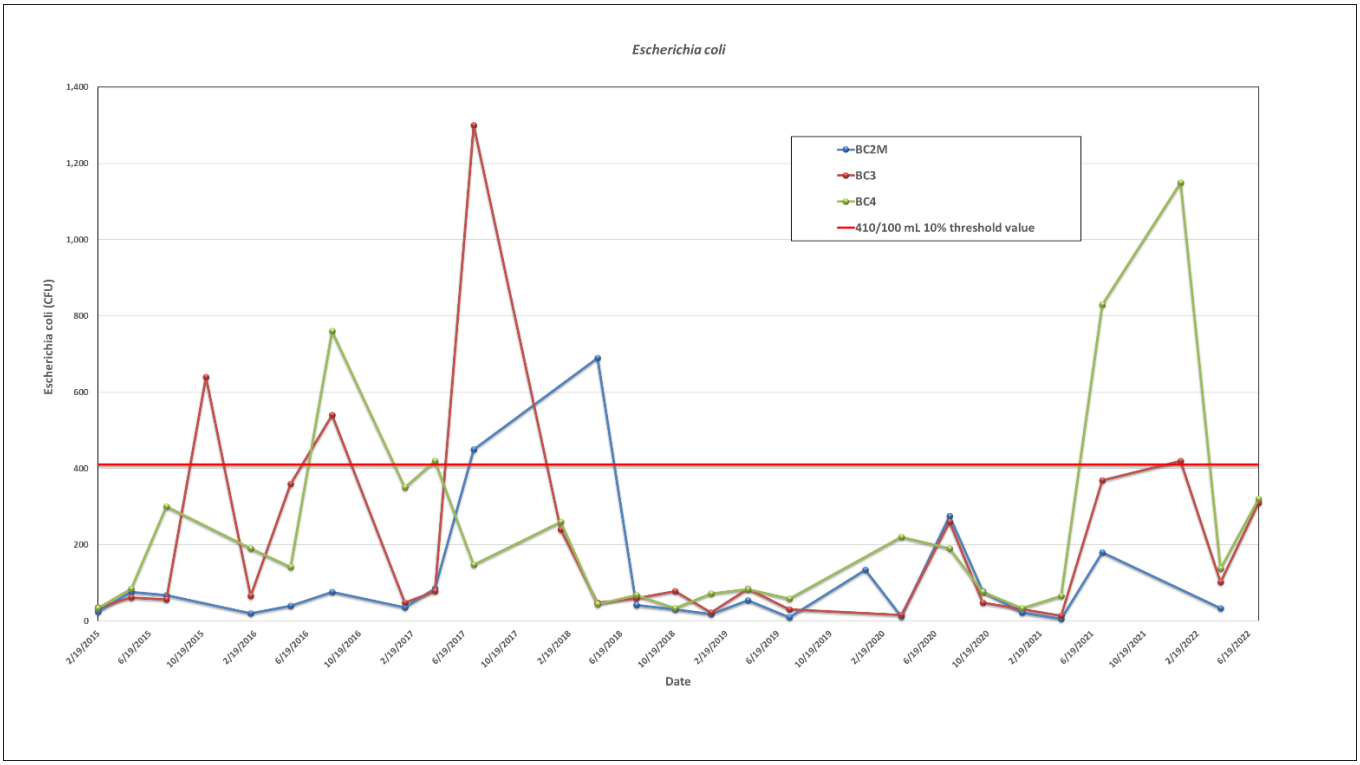

Figure 4. *E. coli* results for Northeast Black Creek.

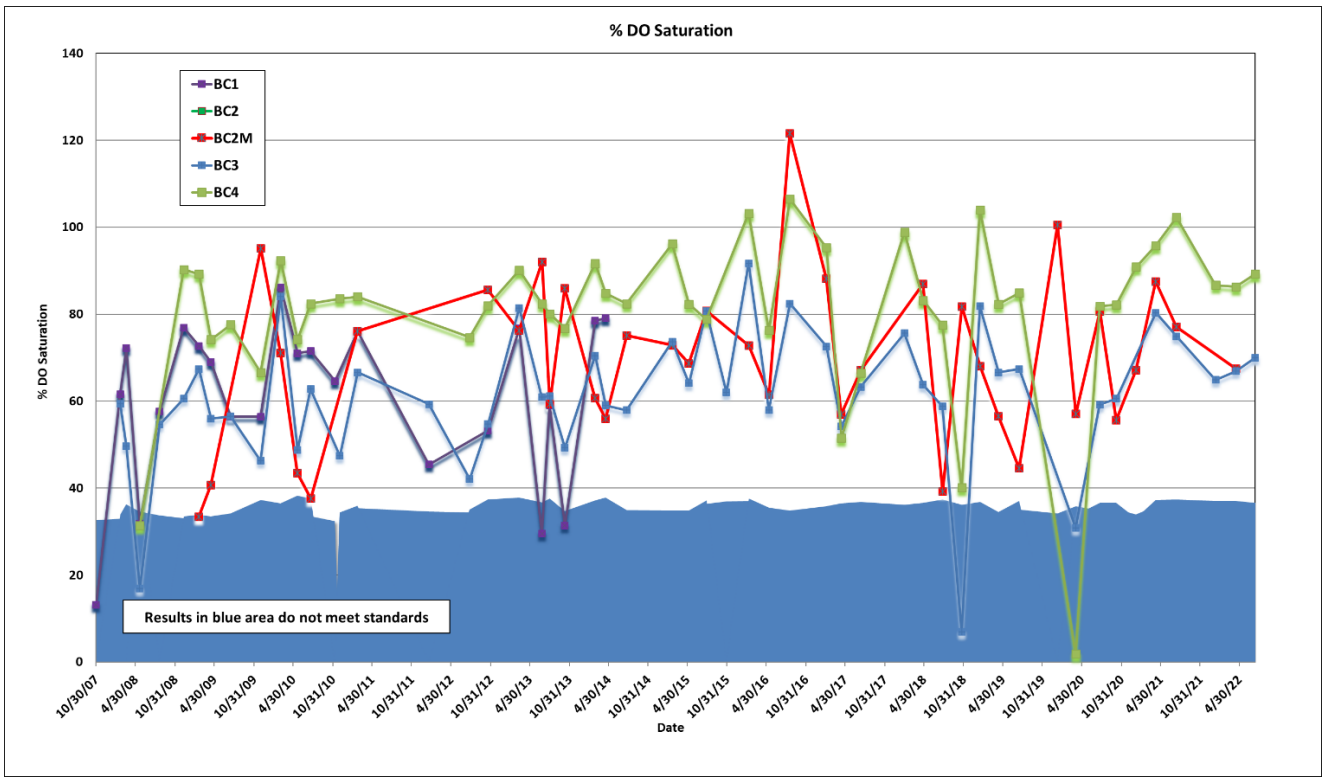

Figure 5. Dissolved Oxygen Percent Saturation results for Northeast Black Creek.