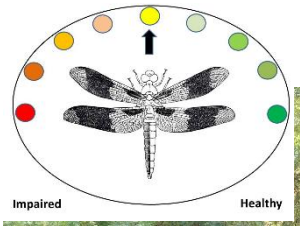
Gum Creek EcoSummary



Located in central Leon County, the urbanized Gum Creek meanders south through several wetlands, and eventually flows into Munson Slough.

Approximately 53% of the land uses in the 5,291-acre watershed are urban, utilities, transportation, and rangeland (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

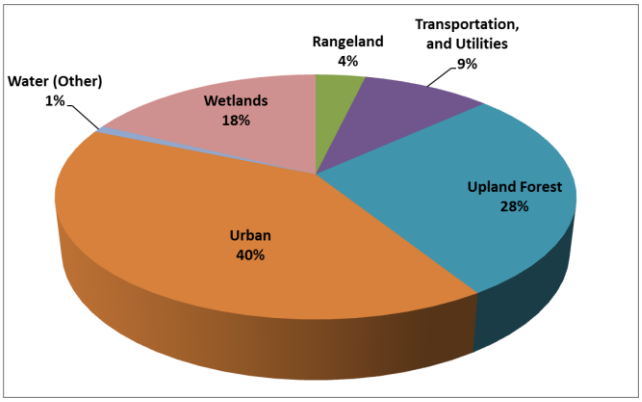


Figure 1. Gum Creek watershed land use.

Background

Healthy, well-balanced lake communities may stay that way 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 Leon County waterbodies 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, as well as beaver and construction activities, four temporally independent samples per year could not be collected from stations. When viewing tables and figures, the absence of data means there was not enough data collected to fulfill data requirements.

As of 2009, Station GC2 is no longer sampled.

Nutrients

The nutrient thresholds and results are found in **Tables 1 and 2**. When the NNC criteria could be met, it was shown that no exceedances for nitrogen or phosphorus have occurred since 2006.

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.

Table 1. NNC threshold and Total Nitrogen results for Gum Creek. Results in bold signify exceedances of the State criteria.

Gum Creek	Instream Protection Criteria				
	TN (1.03 mg/L)				
Year	GC1	GC2	GC3	GC4	GC2T
2005	0.69	0.63	0.53	0.69	-
2006	**1.10**	0.89	-	0.57	-
2007-2008	-	-	-	-	-
2009	0.66	-	0.53	0.77	0.59
2010	0.93	-	0.82	1.03	0.75
2011-2012	-	-	-	-	-
2013	0.68	-	0.66	-	-
2014	-	-	-	-	-
2015	-	-	-	-	0.71
2016	-	-	0.59	-	-
2017	-	-	0.73	0.95	-
2018	0.56	-	0.65	0.74	-
2019	-	-	0.65	-	-
2020-2021	-	-	-	-	-
2022	0.60	-	0.60	-	-
2023	-	-	-	-	-

Dissolved Oxygen (DO)

As **Figure 4** shows, Gum Creek station GC2T periodically failed to meet the Class III criteria for DO. Station GC4 failed to meet the limit once over the period of record. Due to beaver activity, the flow at station GC2T is often stagnant or flowing very slowly, leading to low DO levels.

Table 2. NNC threshold and Total Phosphorus results for Gum Creek.

Gum Creek	Instream Protection Criteria				
	TP (0.18 mg/L)				
Year	GC1	GC2	GC3	GC4	GC2T
2005	0.05	0.05	0.10	0.15	-
2006	0.11	0.13	0.08	0.09	-
2007-2008	-	-	-	-	-
2009	0.06	-	0.05	0.08	0.05
2010	0.05	-	0.05	0.07	0.04
2011-2012	-	-	-	-	-
2013	0.04	-	0.06	-	-
2014	-	-	-	-	-
2015	-	-	-	-	0.05
2016	-	-	0.05	-	-
2017	-	-	0.04	0.05	-
2018	0.05	-	0.05	0.07	-
2019	-	-	0.05	-	-
2020-2021	-	-	-	-	-
2022	0.04	-	0.05	-	-
2023	-	-	-	-	-

Fecal Coliforms and Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% or more of samples in a 30-day period was occasionally exceeded during the sampling period (**Figure 5**). There has not been an exceedance since 2017.

Conclusions

Apart from Station GC1's Total Nitrogen levels exceeding the state criteria in 2006, Gum Creek met the nutrient thresholds in the East Panhandle Region. Station GC2T periodically failed to meet the Class III criteria for DO. Station GC4 failed to meet the limit once over the period of record. the *E. coli* water quality limit of > 410 in 10% or more of samples in a 30-day period was occasionally exceeded during the sampling

period. There has not been an *E. coli* exceedance since 2017.

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 the watershed – Sample Stations GC1, GC2T, GC3 and GC4.

Johnny Richardson, Water Resource Scientist
(850) 606-1500
Richardsonjo@leoncountyfl.gov

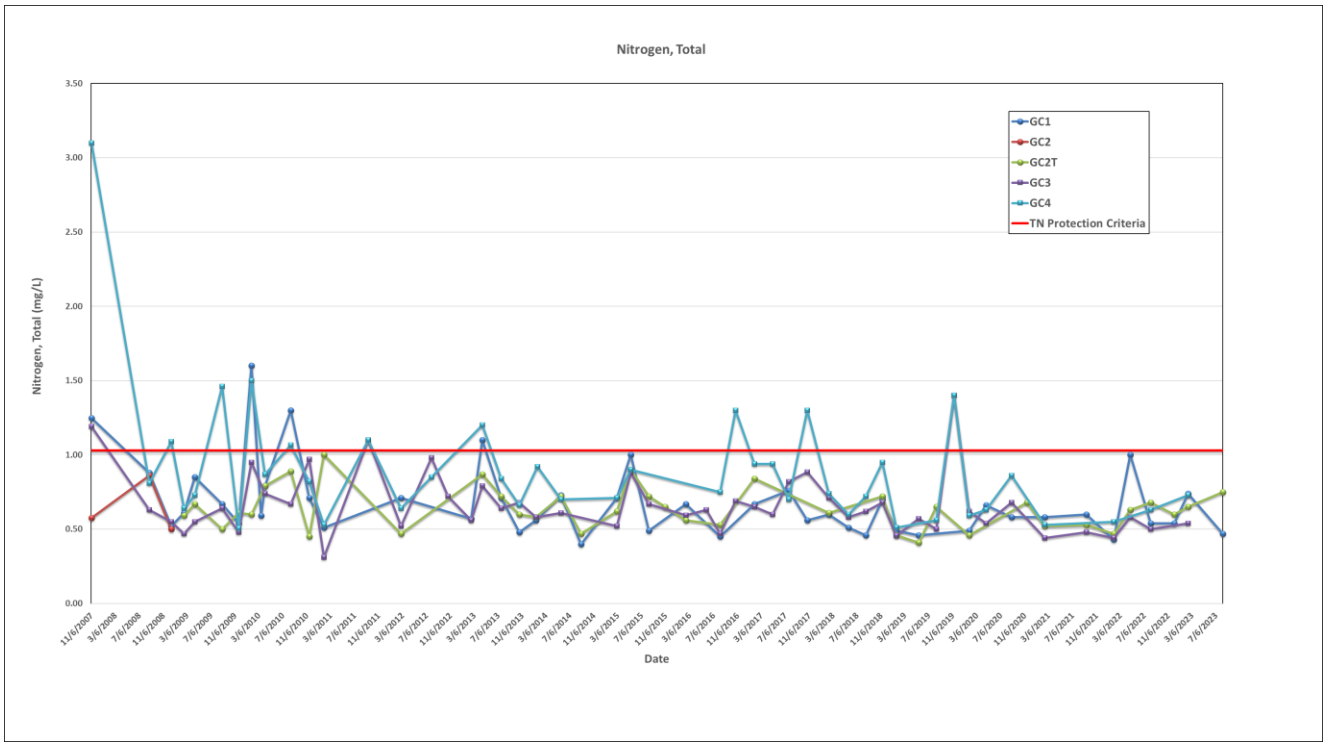


Figure 2. Total Nitrogen results for Gum Creek.

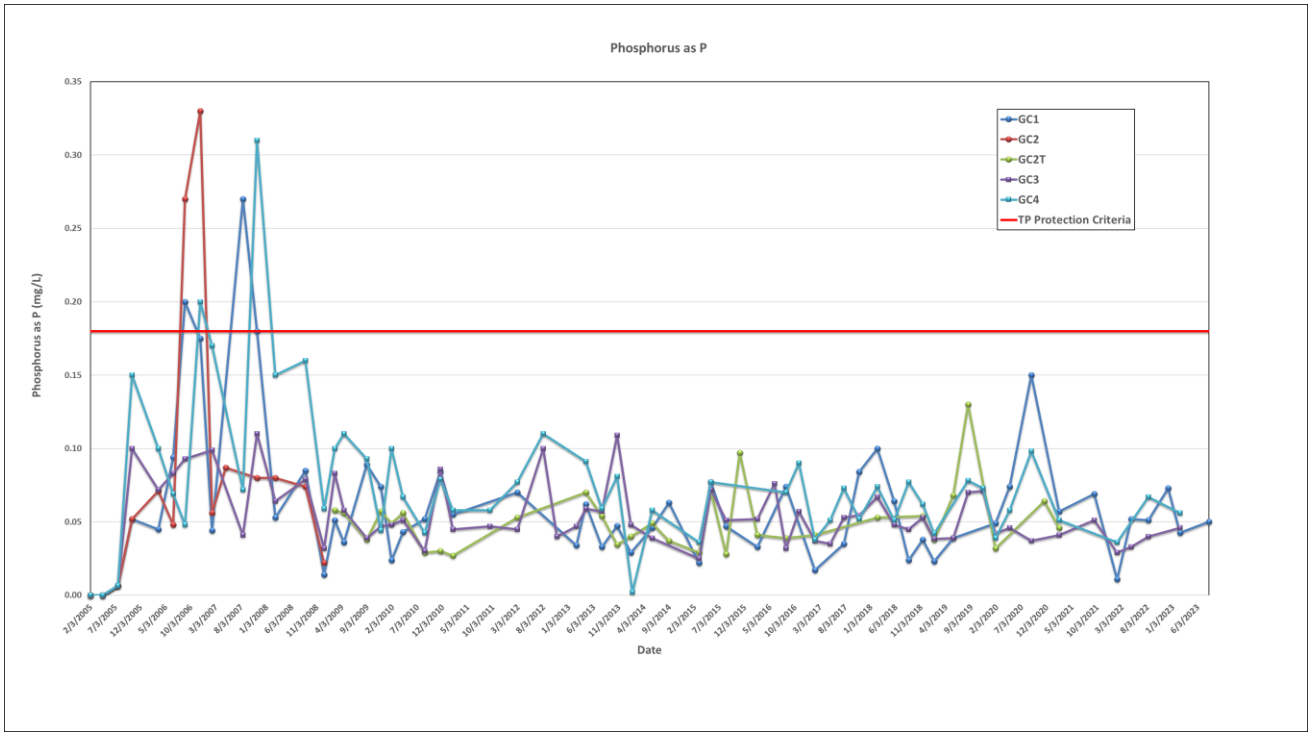


Figure 3. Total Phosphorus results for Gum Creek.

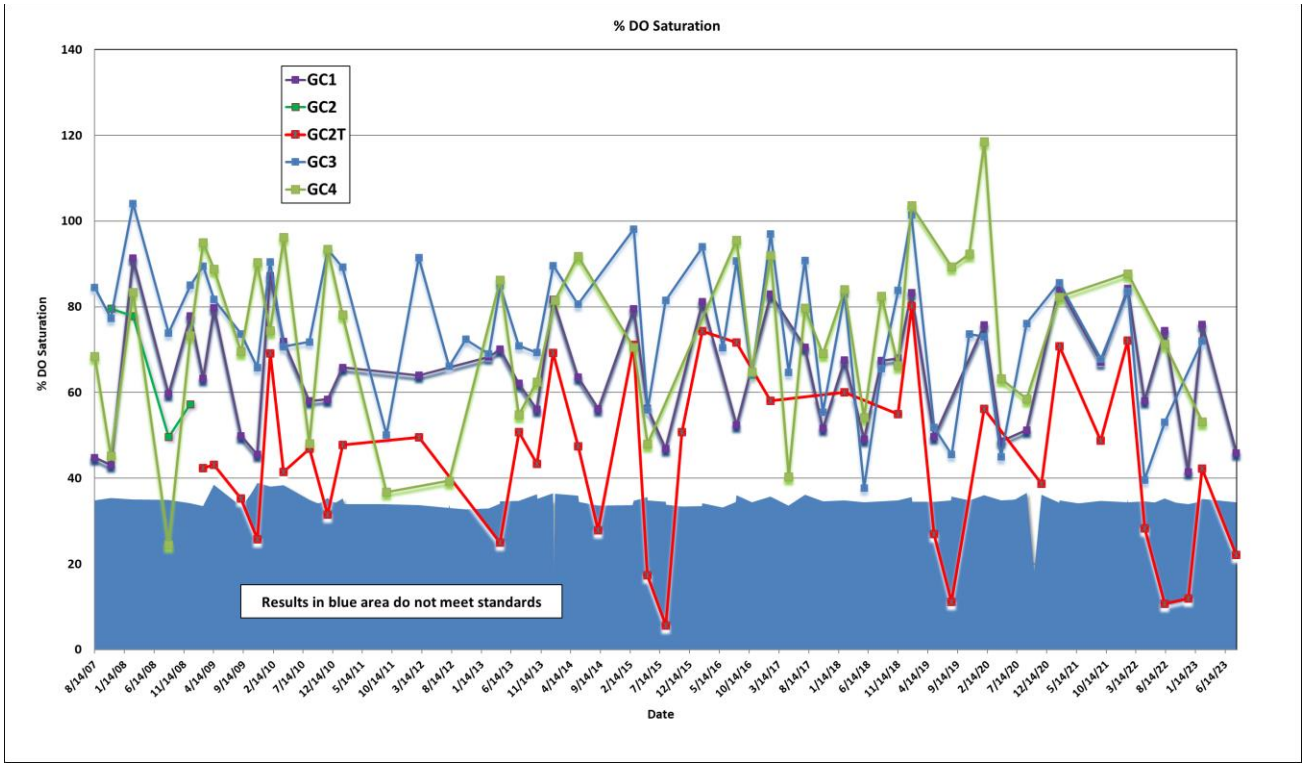


Figure 4. Dissolved Oxygen Percent Saturation results for Gum Creek.

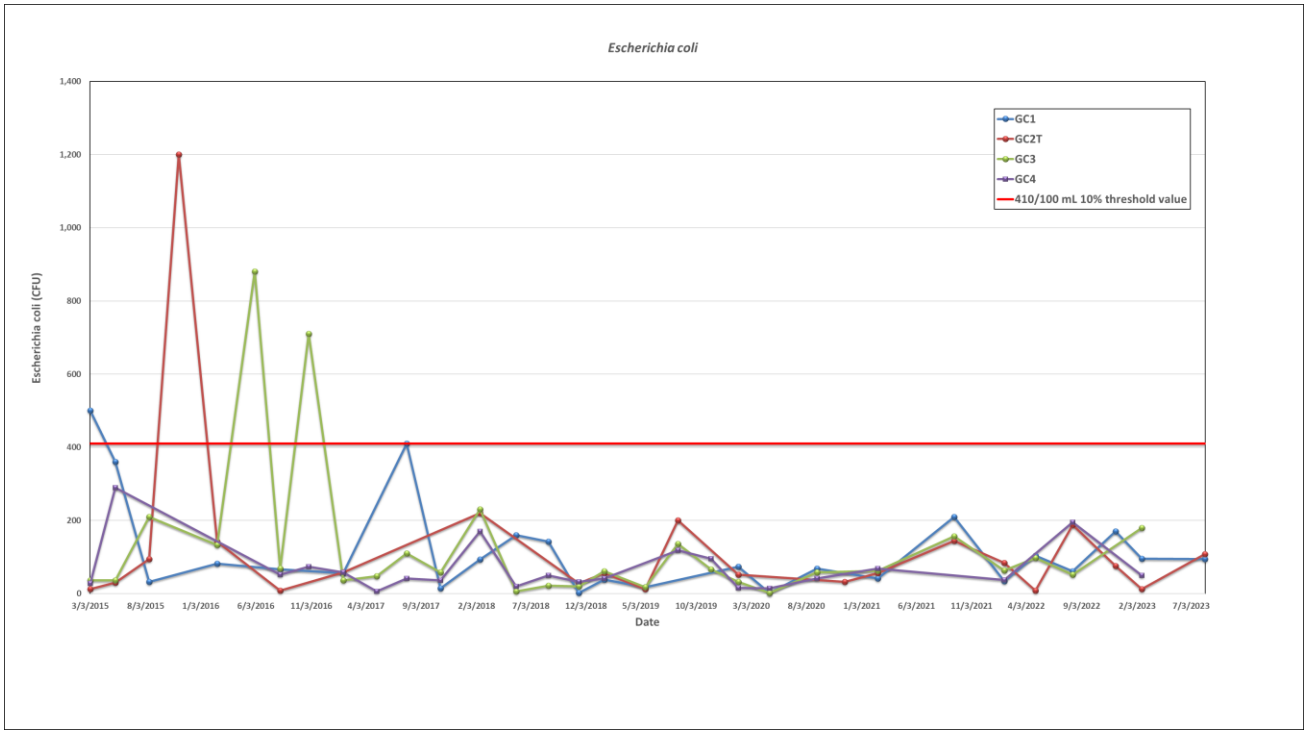


Figure 5. *Escherichia coli* results for Gum Creek.