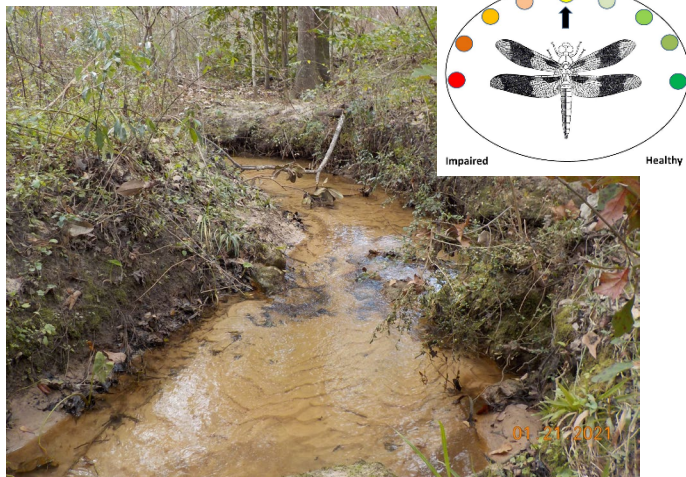


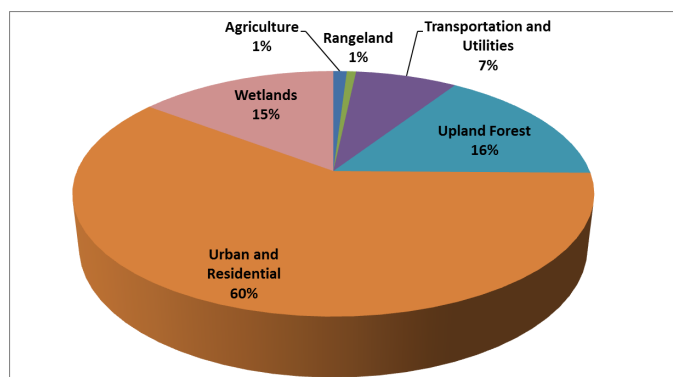
Waterbody: Lexington Creek



Basin: Lake Jackson

Lexington Creek is a moderately altered stream located in the northern part of Tallahassee and drains into the Fords Arm of Lake Jackson. The watershed extends to Thomasville Road at I-10 on the east and is bounded by Maclay Road and Live Oak Plantation Road on the north and south, respectively.

As shown in the following pie chart, agriculture, rangeland, transportation, utilities, urban and residential uses make up approximately 69% of the 1,786-acre watershed. Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.



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.

Methods

Samples were collected to determine the health of Lexington Creek and met the requirements of the Florida Department of Environmental Protection (FDEP).

Results

To reduce flooding where Lexington Creek crosses under Meridian Road, Leon County improved drainage by installing large box culverts to move water beneath the roadway. Such improvements are also expected to better treat stormwater and reduce soil erosion, improving the health of adjacent wetlands and Lake Jackson. Due to construction associated with the drainage improvements to Meridian Road, sampling was temporarily stopped in the latter part of 2020. Sampling resumed during the first quarter of 2021.

According to FDEP requirements, Numeric Nutrient Criteria (NNC), expressed as an annual geometric mean, cannot be exceeded more than once in a three-year period. The nutrient thresholds and results are found in Table 1. Due to low water conditions and the almost ephemeral nature of this system, four temporally independent samples per year could only be intermittently collected during the sampling period. However, up until 2018, when the appropriate number of samples were collected, nutrient criteria were being met. In 2018, and for the first time since Leon County sampling began, the total phosphorus criteria was exceeded and was again exceeded in 2019 and 2021.

This is not completely unexpected. Individual values were sometimes elevated during the sampling period

Figure 1). For example, due to a rainfall event that flushed phosphorus laden sediment into the creek, the August 2012 total phosphorus value (1.3 mg/L) was substantially higher than all other phosphorus values recorded at this site.

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

Lexington Creek	Total Nitrogen Threshold 1.03 mg/L	Total Phosphorus Threshold 0.18 mg/L
2007	-	-
2008	0.43	0.15
2009	0.13	0.14
2010	0.42	0.15
2011-2013	-	-
2014	0.33	0.12
2015-2017	-	-
2018	0.33	0.21
2019	0.40	0.20
2020	-	-
2021	0.35	0.23

The total nitrogen results over the entire sampling period did not exceed FDEP's 1.03 mg/L threshold value. But individual nitrogen levels have exceeded twice since sampling began (Figure 2). One exceedance occurred during the same August 2012 sampling event (1.7 mg/L) previously mentioned; the other during the November 2008 event (1.1 mg/L).

The unusually high nitrogen and phosphorus levels during the August 2012 event can be attributed to stormwater runoff associated with the heavy rainfall in the area prior to the sampling event. The effects were probably more acute due to the previously dry streambed and the associated floodplain being inundated within a short time

While the August 2012 sample has been the only storm event grab sample that was taken that showed the effects of excessive scouring and runoff, staff notes that excessive sediment deposition is not an uncommon event. Elevated levels of phosphorus and

continued high levels of sediment deposition suggest that current stormwater treatment and volume control were and are not adequate to protect downstream areas.

Escherichia coli (E. coli)

The *E. coli* water quality limit of > 410 in 10% of samples during a 30-day period have been exceeded several times during the sampling period (Figure 3). Leon County and FDEP have been in cooperation in the investigation of the source(s) of the bacteria. The results of the Microbial Source Tracking (MST) analyses and other analyses that track probable wastewater indicators (e.g., sucralose, acetaminophen) suggest that the sources of *E. coli* are human in origin. As part of their normal inspection, the City of Tallahassee undertook the rehabilitation of the sewer lines in the immediate area of the creek. Levels are still elevated with the latest two exceedances occurring during the last two quarters of 2021.

Metals

Lexington Creek exceeded water quality criteria for lead during the 3rd and 4th quarters of 2021. While relic anthropogenic sources such as leaded gasoline are most likely to be the source of these exceedances, recent construction activity in the watershed allowed excessive amounts of runoff to enter the stream. It is thought that runoff that entered the stream contained levels of lead that caused the stream to exceed water quality criteria.

[Click here for more information on metal levels in Leon County waterbodies.](#)

Stream Condition Index and Habitat Assessment

The results of the Habitat Assessment score for Lexington Creek characterize the stream habitat in the Suboptimal category (Table 2). Human induced channel impacts are most apparent in the first 40 meters of the 100-meter transect but some anthropogenic debris is located throughout the channel (and

floodplain), along with sedimentation. The Stream Condition Index (SCI) score was in the low to mid Healthy category with a score of 36. Vial 1 and vial 2 individually scored within one point of each other. The last time a SCI was performed on this stream was in November of 2018. At that time the SCI scored in the Healthy category with a numerical score of 42.

Further analysis of the macroinvertebrate community of the stream presents an inconsistent mixture of results. The Ephemeroptera/Plecoptera/Trichoptera (EPT) taxa are widely regarded as the groups of aquatic insects that contain a large number of pollution sensitive taxa. However, the total for EPT taxa score is only two with one Ephemeroptera taxon and one Trichoptera taxon recovered. No Plecoptera taxa were present in the SCI. Although the stream is in a suburban landscape, FDEP sensitive taxa (seven) outnumbered very tolerant taxa (three) but no long-lived taxa were recovered. Sedimentation is a very real threat to this stream biotic community. By example, in the 2018 sample event, a small section of cobble was noted and sampled as a minor habitat. During the 2021 sample event, that section of the stream had no visible cobble present. However, field samplers did relocate the previously documented cobble habitat about two inches below the surface of the sand streambed.

For more information about the SCI and Habitat Assessment, click [Here](#).

Conclusions

Inconsistent water levels made FDEP sampling frequency requirements difficult to meet. However, when the appropriate number of samples were collected, the NNC was being met, until 2018. The total phosphorus criteria was exceeded in 2018, 2019 and 2021. The SCI score for Lexington Creek was at the low to middle level of the Healthy range, while the Habitat Assessment Score was in the Suboptimal range. The *E. coli* water quality limit has been exceeded several times during the sampling period, with the latest two exceedances occurring during the

last two quarters of 2021. Sedimentation continues to be a threat to the stream biotic community and is contributing to the elevated phosphorus levels. It is probable that the ongoing issue of *E. coli* exceedances are the result of malfunctioning septic tanks or failing sewer lines.

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 2021.](#)

[Click here for a map of the watershed – Sample Site 26.](#)

Johnny Richardson, Water Resource Scientist
(850) 606-1500

Richardsonjo@leoncountyfl.gov

Table 2. Lexington Creek Habitat Assessment Score.

Lexington Creek	Score	Category
Substrate Diversity	11	Suboptimal
Substrate Availability	6	Marginal
Water Velocity	20	Optimal
Habitat Smothering	9	Suboptimal
Artificial Channelization	20	Optimal
Bank Stability	6, 7	Suboptimal, Suboptimal
Riparian Zone Width	10, 8	Optimal, Suboptimal
Riparian Vegetation Quality	6, 6	Suboptimal, Suboptimal
Final Habitat Assessment Score	109	
Interpretation	Suboptimal	

Table 3. Lexington Creek Stream Condition Index Score.

Lexington Creek	Vial 1	Vial 2
Stream Condition Index Metrics Scores		
Total Taxa	0.71	1.43
Ephemeroptera Taxa	1.25	0
Trichoptera Taxa	0	0
% Filter Feeder	10	10
Long-lived Score	0	0
Clinger Taxa	3	3
% Dominance	2.43	2.45
% Tanytarsini Taxa	8.71	7.60
Sensitive Taxa	2.67	3.33
% Tolerant Taxa	3.85	4.47
SCI Vial Score	36.24	35.88
Stream Condition Index Score	36	
Score Interpretation	Healthy	

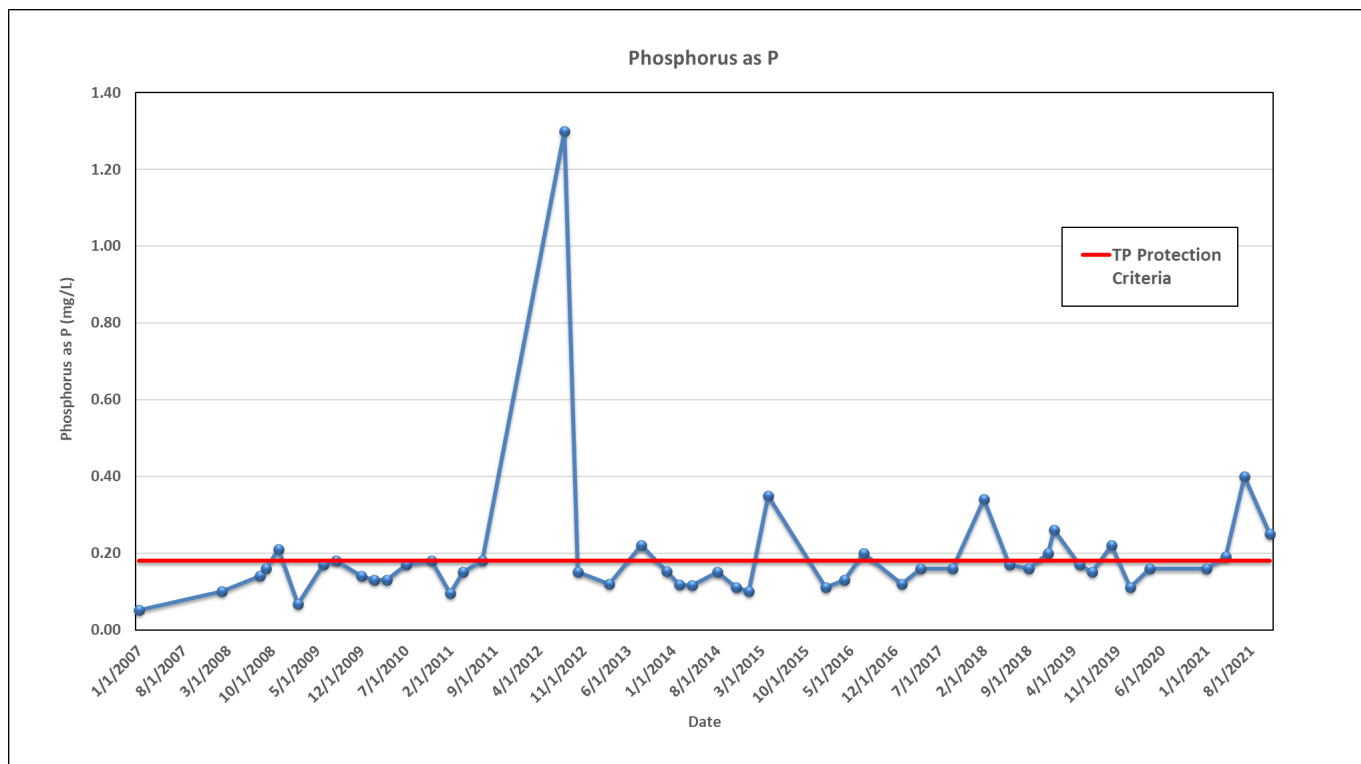


Figure 1. Total phosphorus values in Lexington Creek.

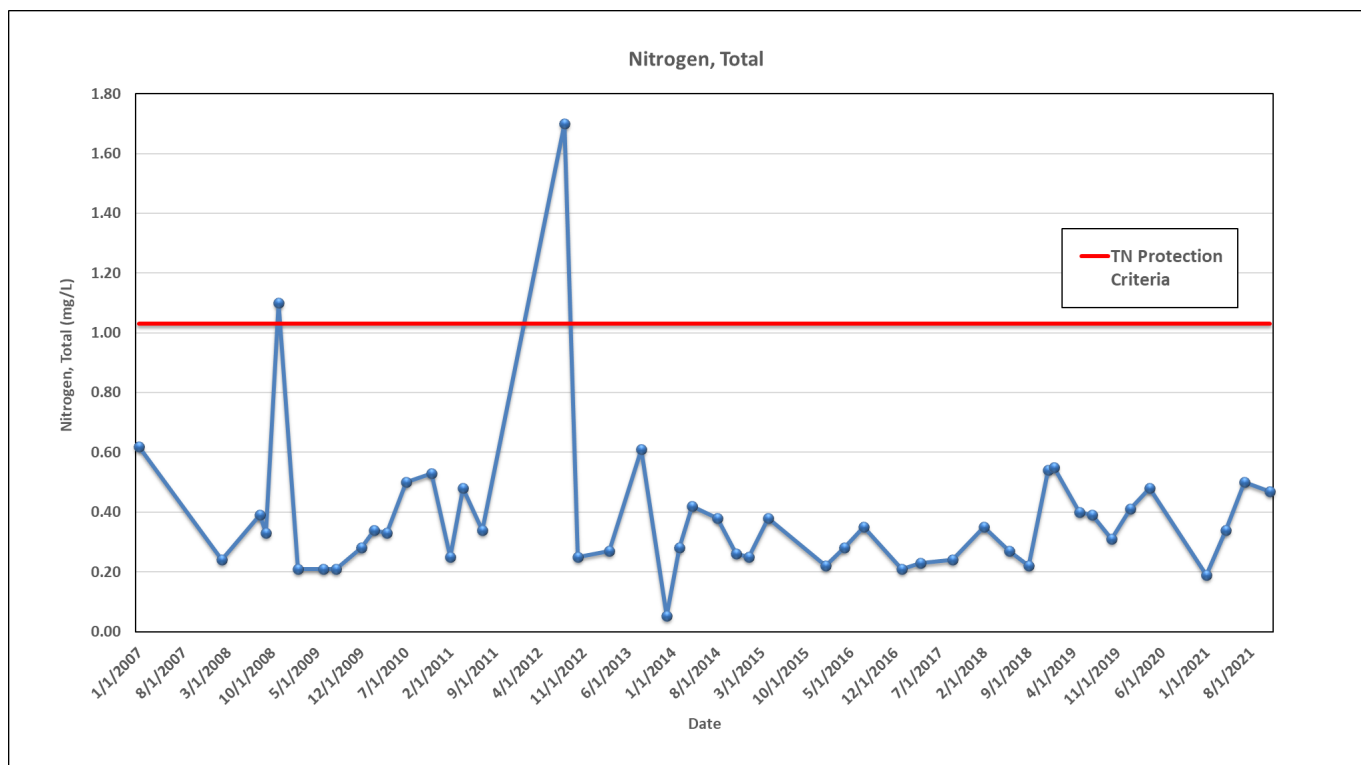


Figure 2. Total nitrogen values in Lexington Creek.

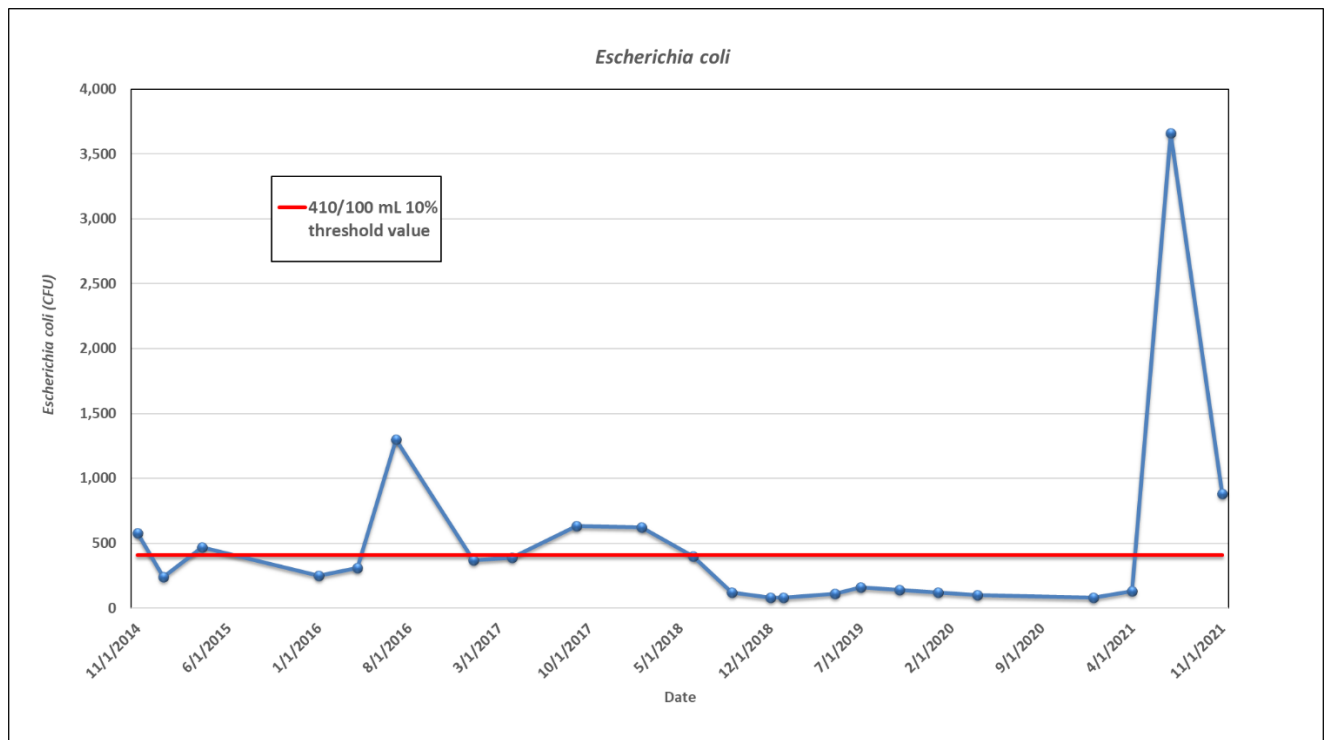


Figure 3. *Escherichia coli* values in Lexington Creek.