## Waterbody: Meginnis Creek



# **Basin: Lake Jackson**

Meginnis Creek is a substantially altered, nitrogenlimited stream located in the northern part of Tallahassee and drains into Lake Jackson.

As shown in the pie chart below, residential, commercial and transportation uses make up approximately 85% of the 2,416-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 nuisance (generally exotic) plants and animals. Water quality standards are designed to protect designated uses of the waters of the state (e.g., recreation, aquatic life use support), and exceedances of these standards are associated with interference with the designated use.

#### Methods

Surface water samples were collected to determine the health of Meginnis Creek and met the requirements of the Florida Department of Environmental Protection (FDEP).

#### Results

According to FDEP requirements, Numeric Nutrient Criteria (NNC) (expressed as annual geometric means) cannot be exceeded more than once in a three-year period. Due to low water conditions, four temporally independent samples per year were not collected from the original sampling station. Staff established the new Meginnis Arm station in April 2010, so the 1<sup>st</sup> guarter sample was not collected for that year. Low water levels precluded staff from collecting water samples during the latter half of 2011 and all of 2012 - 2013. Sampling activities resumed in 2014, and the NNC sampling requirements were beginning to be met in 2015 (Table 1). Due to low water levels, Leon County staff could only collect samples for the first two guarters of 2020 with none being collected in 2021. When sampling requirements were met, the NNC were never exceeded during the period of record.

For illustrative purposes, individual data points were plotted to determine any possible trends (Figures 1 and 2). With few exceptions, individual values did not exceed the instream criteria for total phosphorus and never exceeded the criteria for total nitrogen.

#### **Other Parameters**

Dissolved oxygen often did not meet Class III water quality standards (Figure 3). This is not surprising

since this system is a low velocity system. Lower velocity systems generally have lower levels of dissolved oxygen than high velocity systems because they are less aerated.

Specific conductivity and dissolved solids in Meginnis Creek (averaged 116  $\mu$ mhos/cm and 71.5 mg/L respectively for the first two quarters of 2020) were elevated when compared to Lake Jackson (averaged 46  $\mu$ mhos/cm and 31.5 mg/L during the same time period).

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

	Total	Total	
Maginnic Crook	Nitrogen	Phosphorus	
weginins creek	Threshold	Threshold	
	1.03 mg/L	0.18 mg/L	
2010- 2014	-	-	
2015	0.38	0.05	
2016	0.26	0.05	
2017	0.35	0.05	
2018	-	-	
2019	0.30	0.04	
2020-2021	-	-	

The combination of relatively high levels of conductivity and dissolved solids with relatively low nutrients suggest that the dissolved solids may be the result of impervious surfaces in the watershed. Water is more efficiently transported over impervious surfaces where it can pick up weathered calcium carbonate and other calcium salts (found in concrete) due to efflorescence in the increased expanses of impervious surfaces and drainage systems.

Other water quality parameters were typical of the stream, and no exceedances were noted.

## Vegetation

Several species of exotic plants are associated with the Meginnis Creek stream corridor including Taro (Colocasia sp.), alligator weed (Alternanthera philoxeroides), Chinese tallow (Sapium sebiferum), rattlebox (Sesbania punicea) and hydrilla (Hydrilla verticillata). In many cases exotic plants will crowd out native plants which in turn stress native wildlife which has evolved to depend on native plants for food and shelter. The native wildlife may move away or perish if the native vegetation is replaced by exotic plants. The Florida Fish and Wildlife Conservation Commission have an aquatic plant management program that manages the creek and the greater Lake Jackson area. The program is effective to the degree that the exotic vegetation does not overwhelm the native vegetation, but staff recommends that the problem of exotic plants be more aggressively pursued in this area of the watershed.

## Conclusions

Based on ongoing sampling, Meginnis Creek met the nutrient thresholds for the East Panhandle Region. Specific conductivity and dissolved solids were elevated when compared to Lake Jackson. The combination of relatively high levels of conductivity and dissolved solids with relatively low nutrients suggest that the dissolved solids may be the result of impervious surfaces in the watershed. Dissolved oxygen rarely meets Class III water quality standards. Several species of exotic plants are associated with the Meginnis Creek stream corridor. The Florida Fish and Wildlife Conservation Commission have an aquatic plant management program and continues to manage the creek and the greater Lake Jackson area.

Thank you for your interest in maintaining the water quality of Leon County's aquatic resources. Please feel free to contact us if you have any questions.

## 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> JL01.

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Figure 1. Total phosphorus results for Meginnis Creek.



Figure 2. Total nitrogen results for Meginnis Creek.



Figure 3. Dissolved Oxygen Percent Saturation results for Meginnis Creek.