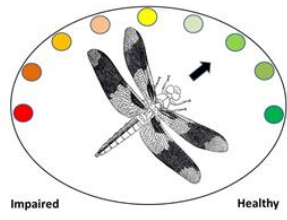


Lake Cascade EcoSummary



Located in western Leon County, the Bradford Brook Chain of Lakes is composed of the cypress rimmed Lakes Bradford (179 acres), Hiawatha (51 acres) and Cascade (124 acres). Water typically flows east via Bradford Brook into Lake Cascade. Lake Hiawatha receives flow from Lake Cascade via a culvert beneath Capital Circle Southwest. Much of the water entering Lake Bradford is via Lake Hiawatha, though at times Grassy Lake flows into Lake Bradford. On occasion, flow is reversed and Lake Bradford flows into Lake Hiawatha which then flows into Lake Cascade. In addition, groundwater sources of flow are possible.

Approximately 32% of land uses in the 16,591-acre Lake Cascade watershed comes from agriculture, rangeland, transportation, utilities, urban and residential (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

Background

Healthy, well-balanced lake 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.

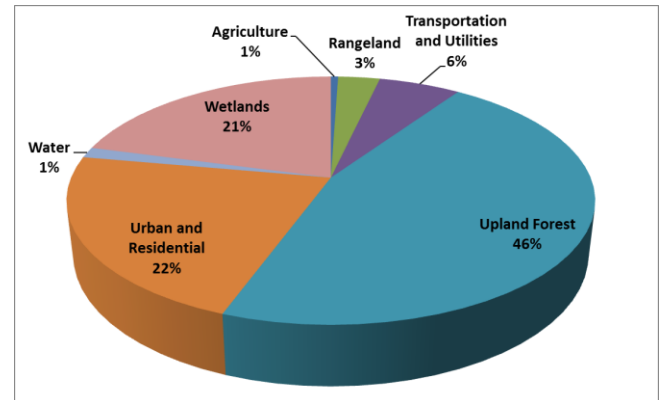


Figure 1. Lake Cascade watershed land use.

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.

For years, many people have thought that an active sinkhole exists in Cascade Lake; however, despite numerous efforts, a sinkhole has not been found. The lake's sandy bottom is permeable and has a high filtration rate, especially when compared to Lakes Hiawatha and Bradford. It is probable that the bottom is more permeable in certain areas than others, but at this time there is no one area than can truly be called a sinkhole. Due to fluctuating water levels, sampling continues to be intermittent, and results remain somewhat inconclusive.

Methods

Surface water samples are collected quarterly (as field conditions allow). Leon County also conducts an annual vegetation survey to evaluate

the health of floral (plant) communities in the County lakes. 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

Nutrients

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.

The nutrient thresholds and results are found in **Table 1**. When data requirements were met, nutrient values did not exceed the state criteria.

Table 1. NNC thresholds and results for Lake Cascade.

Colored Lake	Chlorophyll-a 20 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	2.8	0.21	0.01
2005	2.4	0.43	0.01
2006	3.6	0.38	0.01
2007-2012*	-	-	-
2013	4.7	1.06	0.02
2014	3.9	0.79	0.02
2015*	-	-	-
2016	3.2	0.76	0.01
2017	2.4	0.83	0.01
2018-2023*	-	-	-

* Due to low water conditions, staff could not collect the appropriate number of samples and thus could not determine the NNC for the noted years.

For illustrative purposes, individual data points were plotted to determine any possible trends (**Figures 1-3**). With few exceptions, individual values did not exceed the in-lake criteria.

While the geometric means for the NNC parameters were never exceeded, individual values occasionally rose above the threshold values. There was a large increase in Total Nitrogen and Phosphorus in 2013 (4th and 1st quarters, respectively) and a smaller increase in phosphorus levels during the 1st quarter of 2018. Increased levels of nutrients could be attributed to the decay of terrestrial plants that grew in the lake bottom during drought conditions or possibly stormwater runoff associated with the southwest Capital Circle widening. Post nutrient levels have decreased. The chlorophyll-a value for the 1st quarter of 2019 (55.2 µg/L) is by far the highest chlorophyll-a value recorded on Lake Cascade. Other water quality parameters taken during that time frame did not suggest an algal bloom or nutrient problem, so it is unknown why the chlorophyll-a value was so elevated.

Chlorophyll-a data

Water quality samples collected by Leon County are analyzed by Pace Analytical Services – Ormond Beach (Pace), with the analysis results provided back to the County for submission to FDEP. In June 2022, FDEP conducted a routine audit of the chlorophyll-a data. This audit revealed that from October 2014 through December 2020, the chlorophyll-a data was reported as “uncorrected chlorophyll-a” and not “corrected chlorophyll-a”, as it should have been. Pace has since rectified this error and beginning in January 2021, the chlorophyll-a data were properly reported as “corrected chlorophyll-a”. The laboratory also provided Leon County with the “correct chlorophyll-a” data from the affected dates and the information in **Table 1** of this year’s Report has been

changed to reflect this. This has resulted in chlorophyll-a numbers that are lower than past Reports, which in turn has led to changes to the current Report's narrative.

Floral Assessment

The following floral assessment was conducted in 2022. Low water levels in the latter half of 2023 prevented a floral assessment for 2023.

The Lake Vegetation Index score for Lake Cascade was 88, placing the lake's vegetative community in the Exceptional category.

Twenty-one plant species were found during the survey. The native species pond cypress (*Taxodium ascendens*) was the most dominant species on the lake. Other native shoreline vegetation included red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*), and swamp tupelo (*Nyssa sylvatica* var. *biflora*).

Unfortunately, Chinese Tallow Tree (*Sapium sebiferum*), a Category I Invasive Exotic listed by the Florida Exotic Pest Control Council and alligator weed (*Alternanthera philoxeroides*), listed as a Category II Invasive Exotic were found in the lake.

For more information concerning Florida Invasive Exotics, please click on the Florida Exotic Pest Control Council website.

<http://www.fleppc.org/>.

[Click here for more information on the Lake Cascade LVI.](#)

[Click here for more information on common exotic and invasive plants in Leon County wetlands and waterbodies.](#)

Other Parameters

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

Conclusions

Based on ongoing sampling, Lake Cascade continued to meet the nutrient thresholds for the East Panhandle Region and no 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 2023.](#)

[Click here for a map of the watershed – Sample Site B0C.](#)

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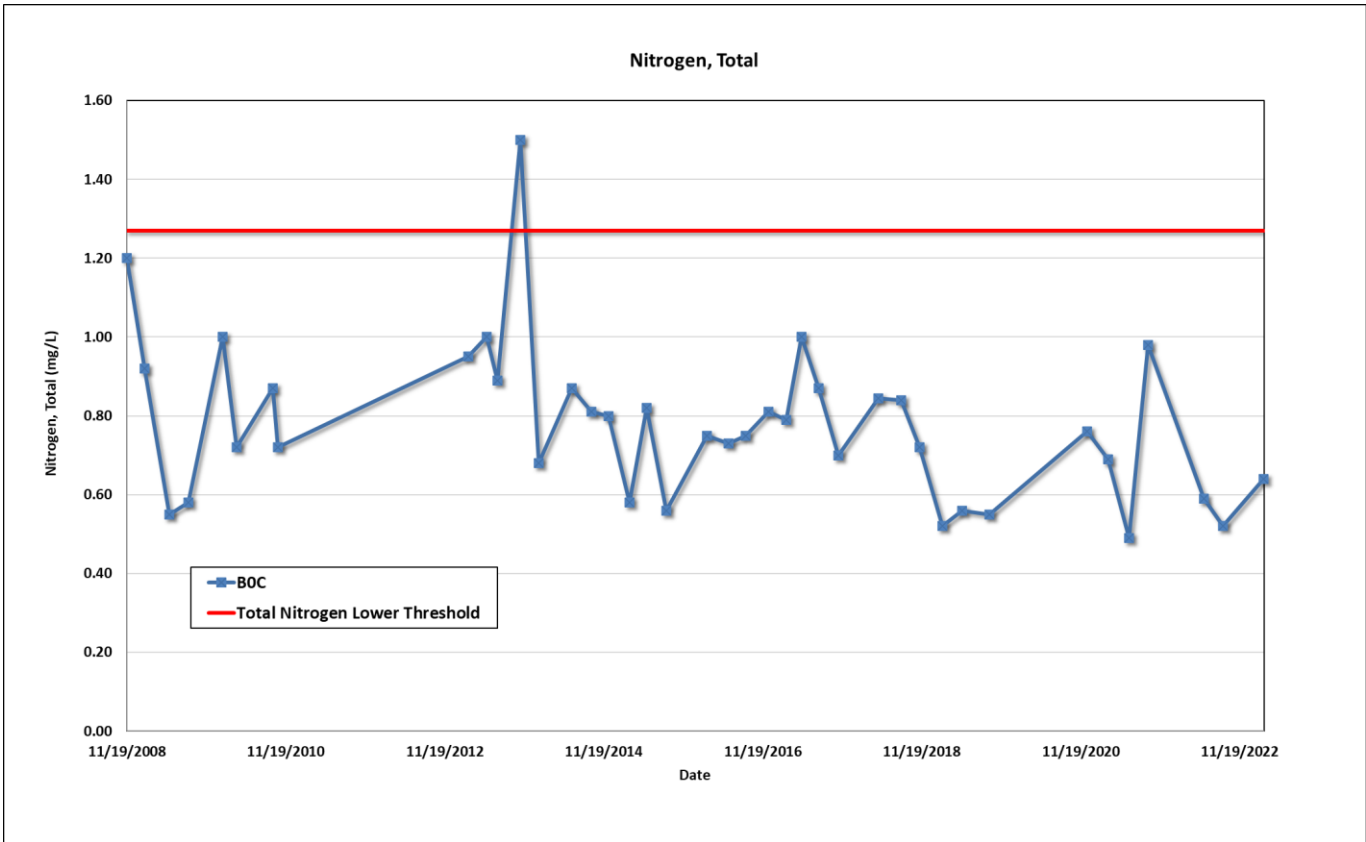


Figure 1. Total Nitrogen results for Lake Cascade.

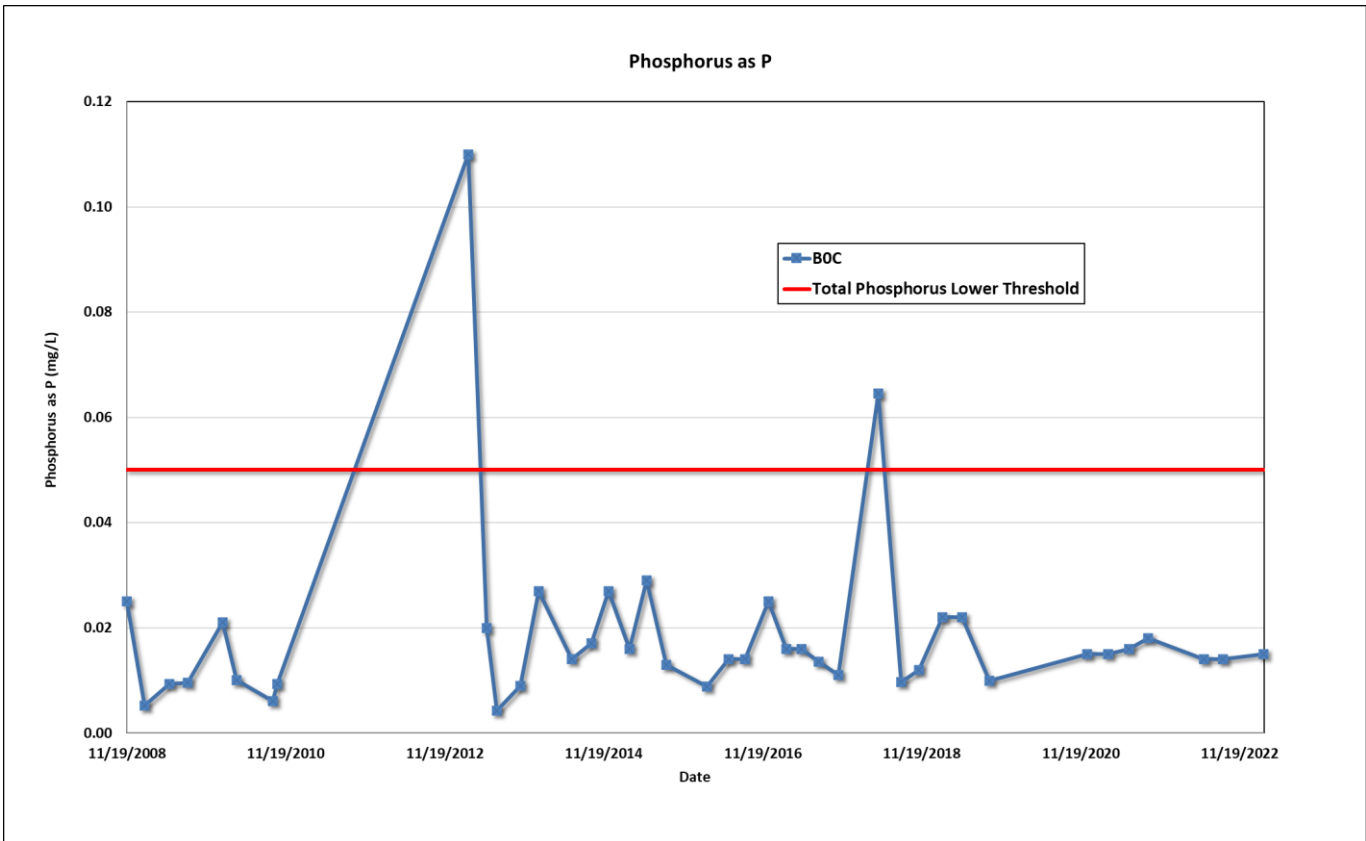


Figure 2. Total Phosphorus results for Lake Cascade.

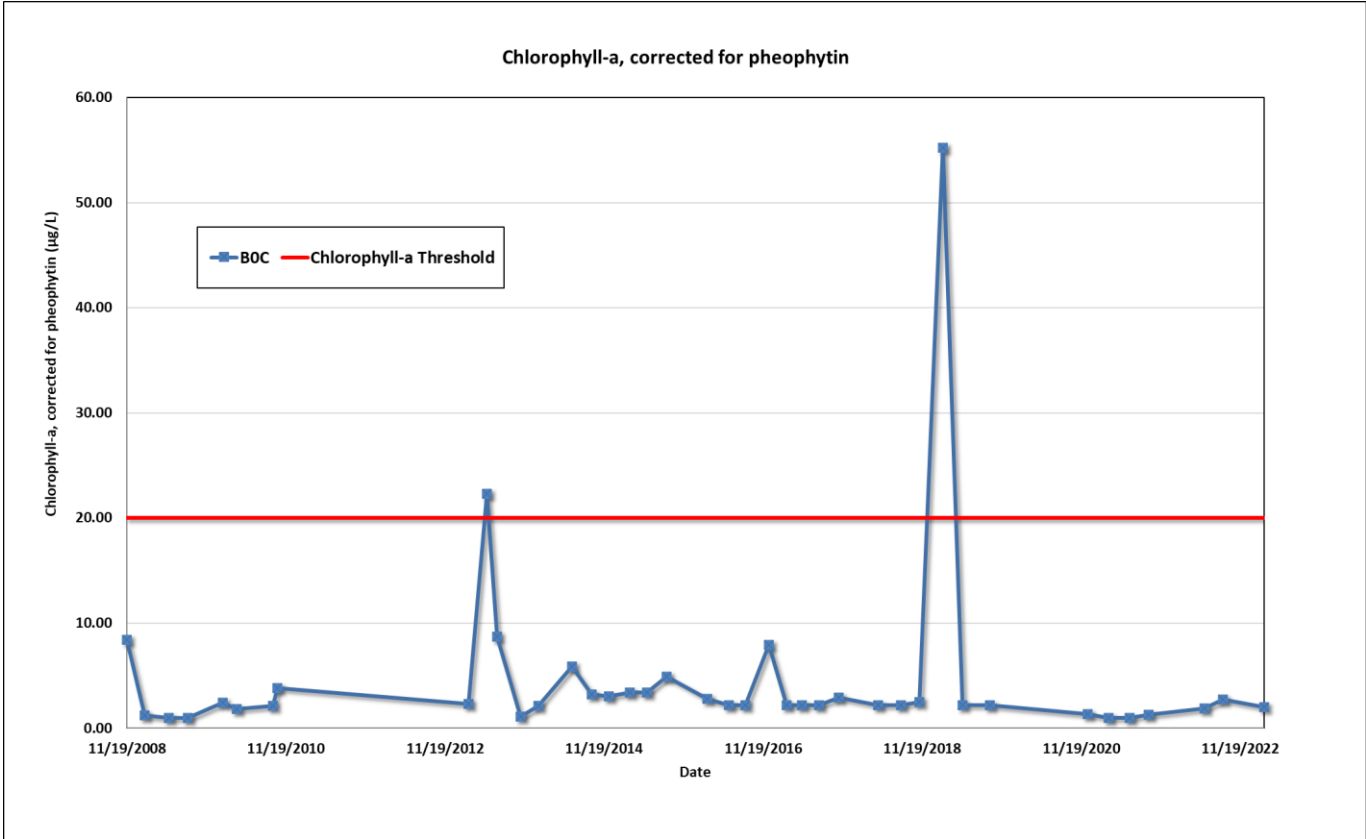


Figure 3. Chlorophyll-a results for Lake Cascade.