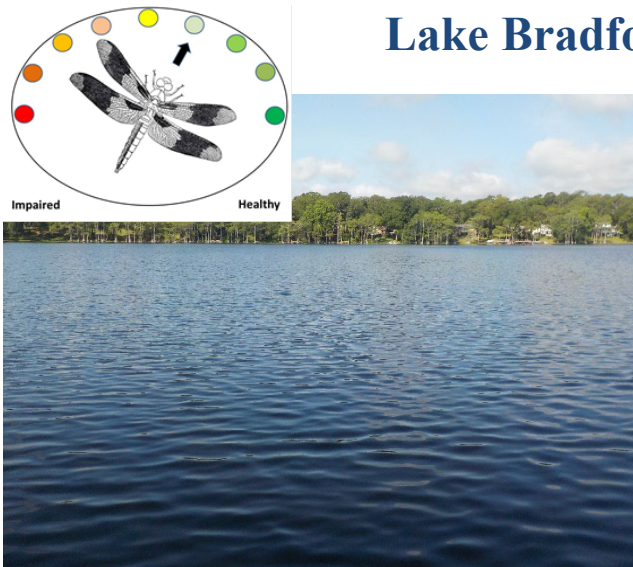


Lake Bradford EcoSummary



Located in western Leon County, the Bradford Brook Chain of Lakes is composed of the cypress rimmed, dark water 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 31% of the runoff flowing into the Bradford Brook Chain of Lakes comes from developed land uses such as 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 stay that way with some level of human activity, but excessive human disturbance may result in waterbody degradation.

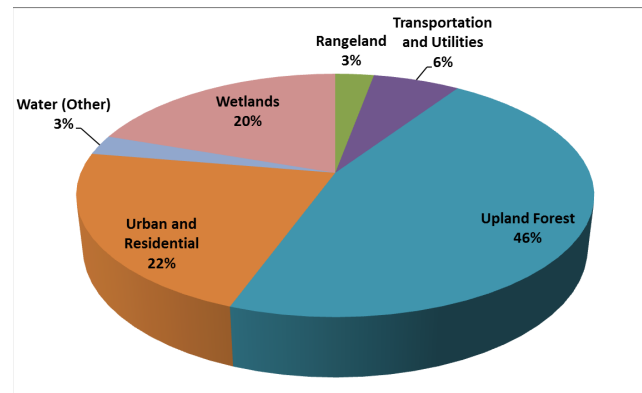


Figure 1. Lake Bradford watershed land use.

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) and sediment samples are collected annually. 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.

Water quality results and thresholds are found in **Table 1**. Since 2004, there have been no exceedances in the NNC.

Table 1. NNC thresholds and sample results for Lake Bradford.

Colored Lake	Chlorophyll-a 20 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	3.0	0.34	0.01
2005	3.0	0.35	0.02
2006	2.0	0.46	0.02
2007	3.3	0.68	0.03
2008	10.1	0.75	0.03
2009	3.4	0.64	0.03
2010	4.4	0.61	0.03
2011	10.0	0.83	0.05
2012	12.7	0.59	0.03
2013	13.0	0.67	0.02
2014	2.1	0.69	0.02
2015	6.4	0.64	0.03
2016	6.2	0.63	0.02
2017	4.0	0.67	0.02
2018	7.1	0.71	0.03
2019	3.3	0.50	0.02
2020*	-	-	-
2021	1.4	0.50	0.01
2022	3.2	0.54	0.02

* Due to access restrictions associated with the COVID-19 pandemic, staff could not access the lake during the 2nd quarter of 2020 and thus could not determine the NNC for 2020.

Chlorophyll-a

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.

Metals

Copper (231 µg/L), lead (27.3 µg/L), and zinc (150 µg/L) levels were extremely elevated and exceeded Class III water quality standards during the 3rd quarter of 2022. While lead results have commonly exceeded Class III water quality standards over the sampling period, levels have been much lower (average exceedance value was 1.41 µg/L). Leon County staff have not noted copper and zinc levels exceeding Class III standards in Lake Bradford since sampling begin. Other parameters appeared normal during the sampling event and nothing out of the ordinary was noted. Given the extreme levels, it is possible that the sample was contaminated in some manner, so metal results should be evaluated with this in mind.

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

Fish Consumption Advisory

The Florida Department of Health has issued consumption limits for certain fish in Lake Bradford due to elevated levels of mercury.

[Click here for more information about fish consumption advisories.](#)

Floral Assessment

The Lake Vegetation Index (LVI) score for Lake Bradford was 63, placing the lake's vegetative community in the Healthy category.

Twenty-seven plant species were found during the survey. The native species pond cypress (*Taxodium ascendens*) and maidencane (*Panicum hemitomon*) were the most dominant species. Other species include red maple (*Acer rubrum*) and buttonbush (*Cephalanthus occidentalis*).

Torpedo grass (*Panicum repens*) is listed as a Category I Invasive Exotic by the Florida Exotic Pest Control Council and is a concern in Lake Bradford. Alligator weed (*Alternanthera philoxeroides*) is listed as a Category II Invasive Exotic and was 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 Bradford 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 results, Lake Bradford continued to meet the nutrient requirements. Metals were extremely elevated during the 3rd quarter of 2022, but there is a possibility of sample contamination so the results should be evaluated with caution. The LVI score for Lake Bradford was 63, placing the lake's vegetative community in the Healthy category.

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 Site B0B.](#)

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