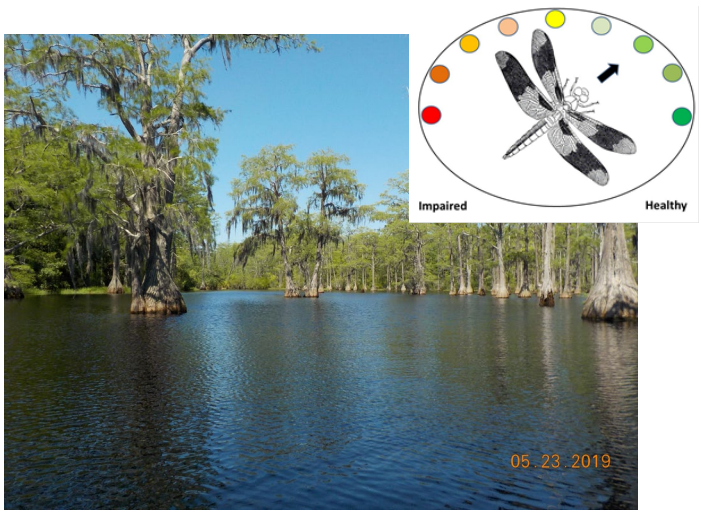
Waterbody: Lake Cascade



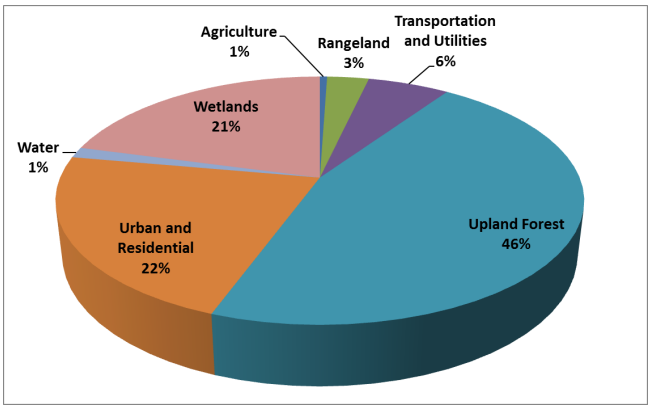
Basin: Lake Munson

The Bradford Brook Chain of Lakes is composed of the cypress rimmed Lakes Bradford (179 acres), Hiawatha (51 acres) and Cascade (124 acres) and is located in western Leon County. 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.

As shown in the following pie chart, approximately 32% of land uses in the 16,591-acre Lake Cascade watershed are agriculture, rangeland, transportation, utilities, urban and residential. Increases in stormwater runoff and waterbody nutrient loads can often be attributed to these types of land uses.

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. 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.

Lake Cascade has an active sinkhole and is affected by drought conditions more than either Bradford or Hiawatha. Due to drought conditions, sampling has been intermittent, and results remain inconclusive.

Methods

Surface water, sediment sampling and a Lake Vegetation Index (LVI) were collected to determine the health of Lake Cascade and met the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Nutrients

The nutrient thresholds and results are found in Table 1. Due to low water, the Numeric Nutrient Criteria data requirements could not be calculated for years 2007-2012, 2015, 2018 and 2019. 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. No numeric nutrient criteria were exceeded, but there

was a large increase in total nitrogen in 2013. Increased levels of nitrogen could be attributed to the decay of terrestrial plants that grew in the lake bottom during the drought or possibly stormwater runoff associated with the southwest Capital Circle widening. Post 2013 nitrogen levels, while still elevated when compared to the 2004-2006 results, have decreased. Due to low water levels staff were unable to collect samples during the 4th quarter of 2019. Based on three samples, total nitrogen (0.54 mg/L) and total phosphorus (0.02 mg/L) would meet the NNC. However, the chlorophyll-a value for the 1st quarter of 2019 (89.3 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. The second (5.3 µg/L) and third (2.7 µg/L) quarter values are more typical of Lake Cascade.

Floral Assessment

The Lake Vegetation Index score for Lake Cascade was 84, placing the lake's vegetative community in the exceptional category.

Twenty-five plant species were found during the survey. The native species pond cypress (*Taxodium ascendens*) and maidencane (*Panicum hemitomon*) were the most dominant species of the lake. Other native shoreline vegetation included; red maple (*Acer rubrum*), buttonbush (*Cephalanthus occidentalis*) and swamp tupelo (N*yssa sylvatica var. biflora*).

Unfortunately, Chinese Tallow Tree (*Sapium sebiferum*), a Category I Invasive Exotic by the Florida Exotic Pest Control Council http://www.fleppc.org/, was found at Lake Cascade. Alligator weed (*Alternanthera philoxeroides*) is listed as a Category II Invasive Exotic that was found in the lake. Additionally, the exotic water spangles (*Salvinia minima*) was also found in the littoral zone of the lake.

Click here for more information on the Lake Cascade LVI.

Table 1. FDEP's chlorophyll-*a*, total nitrogen and phosphorus criteria for lakes applied to Lake Cascade. Due to low water the Numeric Nutrient Criteria data requirements could not be calculated for years 2007-2012, 2015 and 2018.

Colored Lake	Chlorophyll-*a* 20 µg/L	Total Nitrogen Threshold 1.27-2.23 mg/L	Total Phosphorus 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	1.16	0.02
2014	4.5	0.79	0.02
2015	-	-	-
2016	5.7	0.76	0.01
2017	4.8	0.83	0.01
2018-2019	-	-	-

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 met the nutrient thresholds for the East Panhandle Region and the floral community is considered "exceptional" by the LVI.

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.LeonCountyFL.gov/WaterResources

Click here to access the results for all water quality stations sampled in 2019.

Click here for a map of the watershed – Sample Site B0C.

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