

Lake Carr EcoSummary



Lake Carr is an approximately 880 acre, primarily phosphorus-limited, shallow lake located north of Lake Jackson and is essentially surrounded by two property owners: Ayavalla Land Company and Orchard Pond LLC. Lake Carr is a valuable biological, aesthetic and recreational resource of Leon County and was designated as an Aquatic Preserve in 1973 for the primary purpose of preserving and maintaining the biological resources in their natural condition.

As shown in **Figure 1**, 38% of land uses in the 5,931-acre Lake Carr watershed are agriculture, rangeland, transportation, utilities, urban and residential. These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads. The lake receives direct runoff from the surrounding agricultural property as well as flow from the residential areas east of Meridian Road (Summerbrooke and Ox Bottom Manor). Waterbodies in the residential areas are modified farm ponds serving as stormwater facilities dedicated to the respective homeowner's associations for maintenance. The Summerbrooke Golf Club (157 acres) also lies in this watershed.

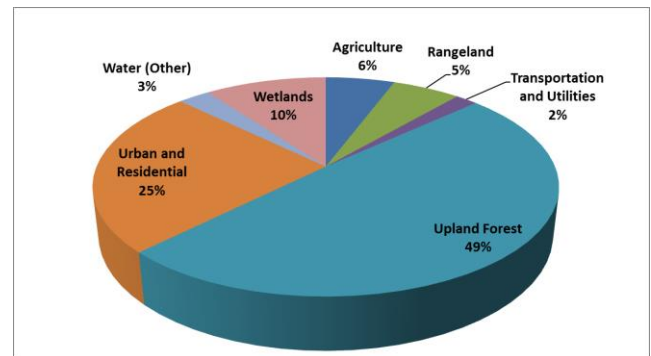


Figure 1. Lake Carr watershed land use.

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.

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 of the NNC.

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 correctly 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.

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

Clear Lake, Low Alkalinity	Chlorophyll-a 6.0 µg/L	TN Threshold 0.51-0.93 mg/L	TP Threshold 0.01-0.03 mg/L
2004	1.3	0.29	0.01
2005	1.4	0.27	0.01
2006	1.1	0.39	0.01
2007	2.2	0.61	0.02
2008	4.6	0.64	0.02
2009	4.8	0.50	0.02
2010	5.5	0.49	0.02
2011	5.2	0.44	0.01
2012-2013*	-	-	-
2014	1.2	0.35	0.01
2015	3.3	0.30	0.02
2016	2.4	0.28	0.01
2017	2.2	0.36	0.01
2018	2.2	0.31	0.01
2019	2.7	0.27	0.01
2020	1.5	0.71**	0.01
2021*	-	-	-
2022	1.0	0.30	0.01
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.

** May 5, 2020, sample contaminated.

Dissolved Oxygen

As **Figure 2** shows, station CA1 dissolved oxygen (DO) percent saturation values did not meet Class III water quality criteria while station CA2 failed to meet the criteria four times during the sampling period. This was not unexpected, since the CA1 station is a shallow station normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake. Plant respiration (samples were often taken in the morning hours) also contributed to the low DO saturation values. While there is a substantial community of submerged

vegetation at the CA2 station, emergent vegetation is relatively uncommon at this site, so conditions are more optimal for rapid water exchange with the remainder of the lake. Staff believes that this is a natural condition for both locations.

Floral Assessment

The Lake Vegetation Index score for Lake Carr was 70, placing the lake's vegetative community in the healthy category.

Thirty-seven plant species were found during the survey. The native species, and fragrant waterlily (*Nymphaea odorata*) and maidencane (*Panicum hemitomon*) were the most dominant plants in the lake.

Other native vegetation included watershield (*Brasenia schreberi*), leafy bladderwort (*Utricularia foliosa*), and pickerelweed (*Pontederia cordata*).

Unfortunately, water hyacinth (*Eichhornia crassipes*), classified by the Florida Exotic Pest Control Council as a Category I Invasive Exotic and Alligator weed (*Alternanthera philoxeroides*), a Category II Invasive Exotic were found in Lake Carr.

[Click here for more information on the Lake Carr 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 impairments were noted.

Conclusions

Based on ongoing sampling, Lake Carr met the NNC for the East Panhandle Region. Staff considers the DO results at Stations CA1 and CA2 a natural condition. The LVI score for Lake Carr was 70, placing the lake's vegetative community in the Healthy category.

Other water quality parameters appear to be normal for the area 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 CA2.](#)

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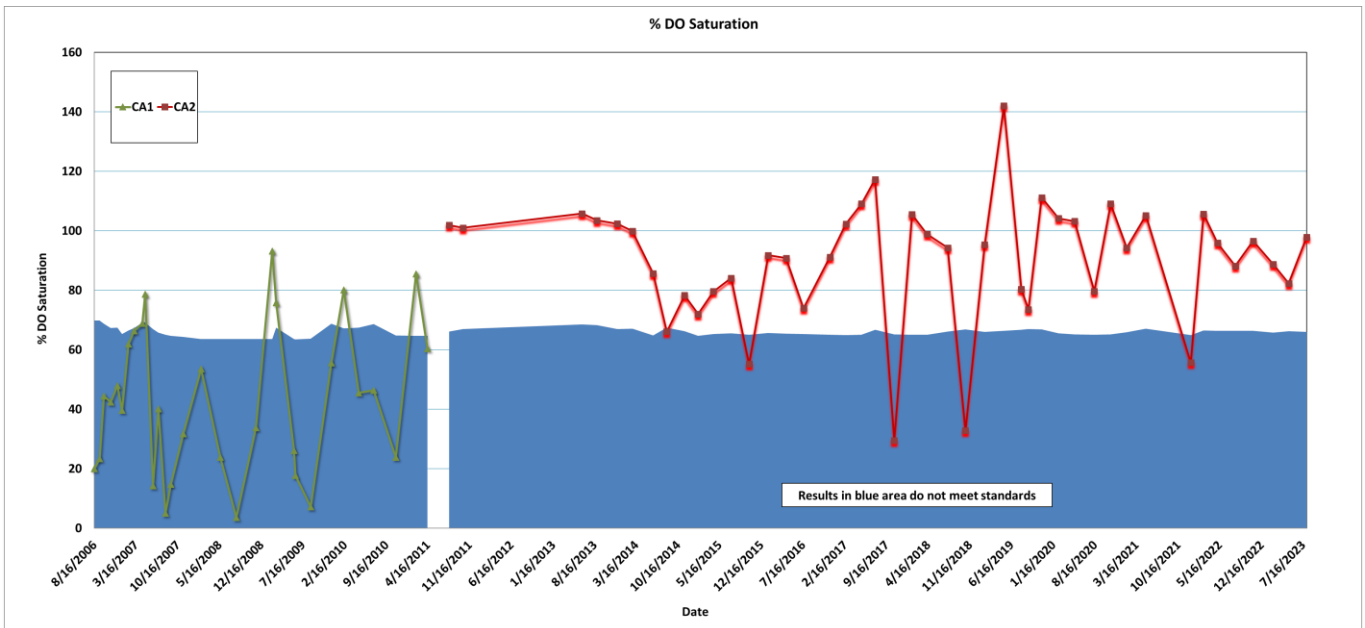


Figure 2. Dissolved Oxygen Percent Saturation results for Lake Carr.