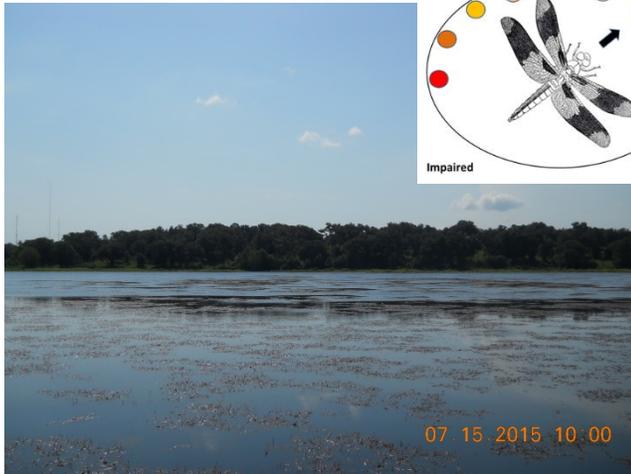


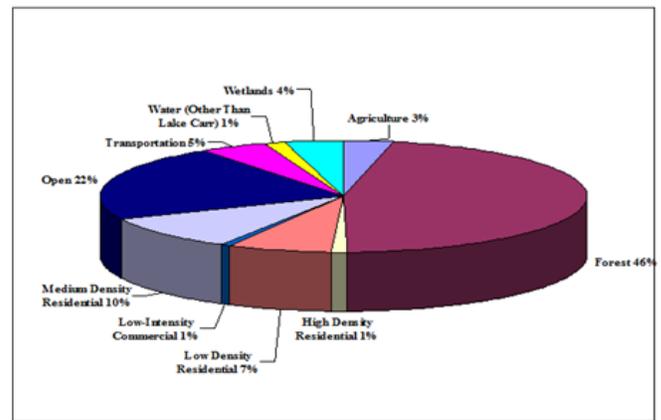
Waterbody: Lake Carr



Basin: Lake Jackson

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 the following pie chart, 27% of land uses in the 4,865 acre Lake Carr watershed are commercial, residential, agricultural, or transportation. 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. 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.

Methods

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

Results

Nutrients

The nutrient thresholds and results are found in Table 1. According to FDEP requirements, Numeric Nutrient Criteria (expressed as an annual geometric mean) cannot be exceeded more than once in a three year period. Due to extremely low water levels and a plethora of aquatic vegetation, staff was

unable to launch a boat to collect water quality samples in 2012 and the first quarter of 2013. The state criteria were not exceeded during the period of record.

Table 1. FDEP’s chlorophyll-*a*, total nitrogen and phosphorus criteria for lakes applied to Lake Carr.

Clear Lake, Low Alkalinity	Chlorophyll- <i>a</i> 6.0 µg/L	Total Nitrogen Threshold 0.51-0.93 mg/L	Total Phosphorus 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	1.4	0.35	0.01
2015	4.0	0.30	0.02

While the State criteria were not exceeded during the period of record, there was an elevated total phosphorus reading (0.20 mg/L) during the 2015 2nd quarter sampling event. The average total phosphorus value in Lake Carr over the sampling period is 0.02 mg/L, and the 0.20 mg/L value is by far the largest value ever recorded in the lake. Lake Hall was sampled on the same day and had an extremely high (for Lake Hall) total phosphorus value as well, that appeared to be erroneous. Because other parameters appeared normal and orthophosphate values

were in the undetectable range (<0.0034 mg/L), and since Lake Hall (sampled on the same day) had a similar aberrant total phosphorus result, staff suggests that the total phosphorus value is erroneous and may have been caused by a laboratory error.

Dissolved Oxygen

As Figure 1 shows, station CA1 percent dissolved oxygen (DO) saturation values did not meet Class III water quality criteria while station CA2 failed to meet the criteria twice 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. The CA2 station is located in relatively open water 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.

Other Parameters

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

Floral Assessment

The Lake Vegetation Index score for Lake Carr was 68, placing the lake’s vegetative community in the healthy category.

Forty-eight plant species were found during the survey. The native species fanwort (*Cabomba caroliniana*), coontail (*Ceratophyllum demersum*) and fragrant waterlily (*Nymphaea odorata*) were the most dominant plants in the lake. Other native shoreline vegetation included: American sweetgum (*Liquidamber styraciflua*), buttonbush (*Cephalanthus occidentalis*) and dotted smartweed (*Polygonum punctatum*). Unfortunately, water hyacinth (*Eichhornia crassipes*), listed as Category I Invasive Exotics by the Florida Exotic Pest Control Council, is an invasive exotic that is a concern in Lake Carr. Another inva-

sive exotic, Alligator weed (*Alternanthera philoxeroides*), was a Category II Invasive Exotic found in the lake.

[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.](#)

Conclusions

Based on ongoing sampling, Lake Carr met the nutrient thresholds for the East Panhandle region; and the floral community is considered “healthy” by the LVI. Staff suggests that the 2015 2nd quarter total phosphorus value is erroneous and may have been caused by a laboratory error. Staff considers the DO results at Stations CA1 and CA2 a natural condition. 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.LeonCountyFL.gov/WaterResources

[Click here to access the results for all water quality stations sampled in 2015.](#)

[Click here for map of watershed – Sample site CA2.](#)

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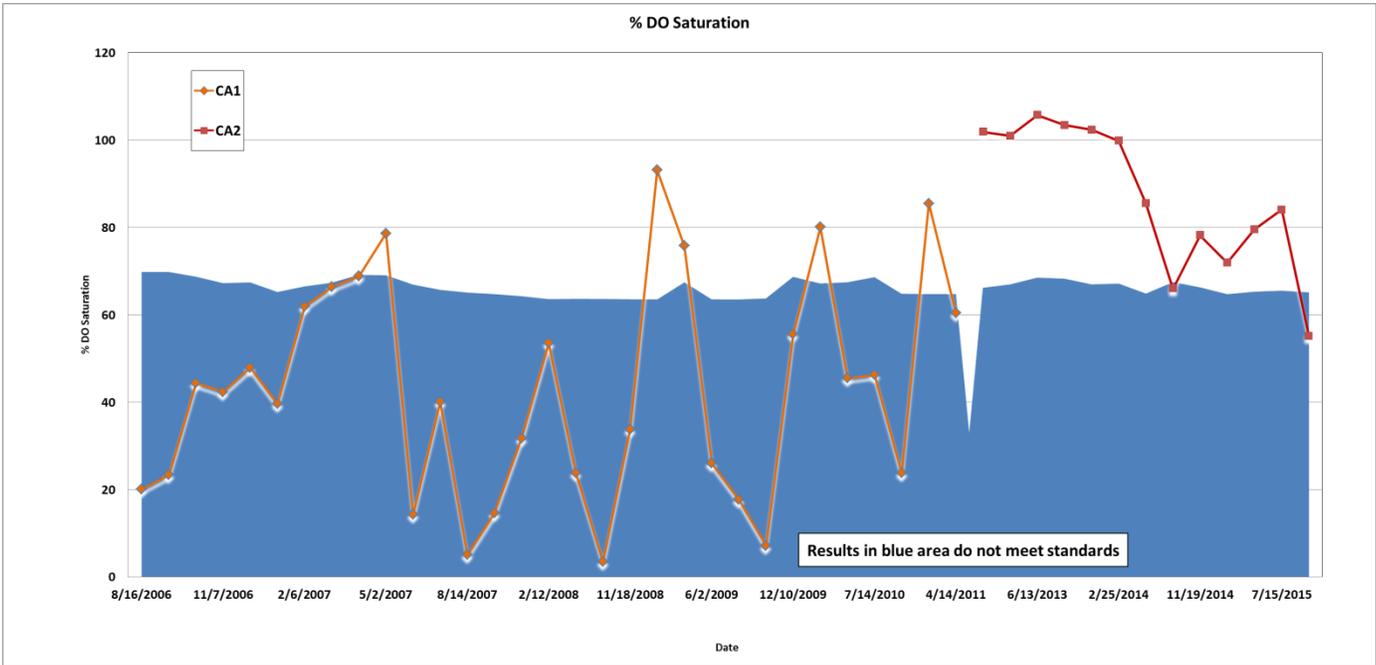


Figure 1. Dissolved Oxygen Percent Saturation results for Lake Carr.