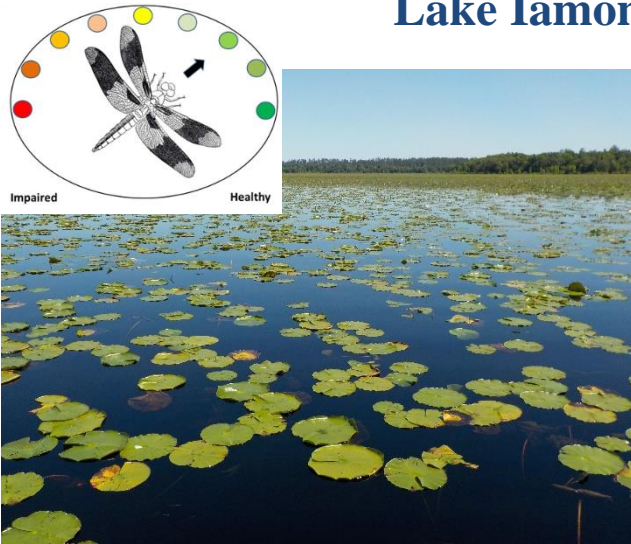


Lake Iamonia EcoSummary



Lake Iamonia is an approximately 5,554 acre, shallow, flat-bottomed, phosphorus-limited, prairie lake located in northern Leon County. Drastic water level fluctuations occur from discharge to the sinkhole and receiving floodwaters from the Ochlockonee River. Various control structures have been constructed (and ultimately dismantled) to attempt to control water level fluctuations.

Starting in the early 1900's, various management practices, especially water-level stabilization, and changes in land use, have led to the abundance of aquatic plants and the accumulation of organic sediment in Lake Iamonia which can impede recreational usage and possibly threaten its fish, wildlife, and ecosystem integrity. One of the largest modifications occurred in 1939, when an earthen dam was constructed to isolate the 20-acre sink basin from the lake. Other modifications continued, including the removal of two gates that were formerly used to control water levels. Prior to their removal in 2007, the gates had remained open since 1980, because the Northwest Florida Water Management District deemed the dam to be unsafe for impounding water. These latest modifications have been performed to protect the public and to allow the

lake to have more naturally fluctuating water levels. Water quality monitoring continues to be used to evaluate the long-term health of the lake.

Approximately 14% of land use in the 66,727-acre Lake Iamonia basin is agriculture, rangeland, urban, utilities or transportation (as shown in **Figure 1**). These types of land uses are often attributed to increases in stormwater runoff and higher nutrient loads.

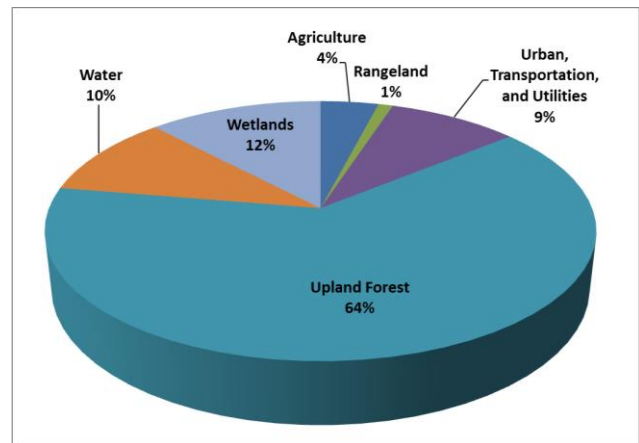


Figure 1. Lake Iamonia watershed land use.

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 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 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.

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 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 Iamonia.

Colored Lakes	Chlorophyll-a 20.0 µg/L	TN Threshold 1.27-2.23 mg/L	TP Threshold 0.05-0.16 mg/L
2004	1.7	0.41	0.01
2005	3.9	0.48	0.01
2006	1.8	0.57	0.02
2007	5.0	0.90	0.02
2008	6.1	1.11	0.04
2009	5.8	0.53	0.02
2010	5.6	0.69	0.02
2011- 2012*	-	-	-
2013	19.1	0.70	0.04
2014	3.5	0.78	0.03
2015	11.5	0.61	0.04
2016	6.4	0.60	0.02
2017	4.8	0.60	0.02
2018	4.1	0.60	0.03
2019	4.3	0.50	0.02
2020	4.5	0.52	0.02
2021	3.1	0.62	0.03
2022	2.2	0.52	0.02
2023	1.7	0.53	0.02

* 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.

During the August 2021 sampling event, the chlorophyll-a levels at station IA2 (72.5 µg/L) and station IA4 (221 µg/L) were extremely high for this lake. Other stations during the same event ranged from 1.0 to 13.6 µg/L. It is

unknown why the chlorophyll-a levels varied so much from the other stations, though it is thought that a large clump of algae cells (vs. a uniform water sample) was collected from one or both sites. The result from station IA4 is the highest chlorophyll-a result recorded from Lake Iamonia.

Dissolved Oxygen (DO)

As **Figure 2** shows, Lake Iamonia often did not meet the state DO criteria. This was not unexpected, since all stations are shallow (usually less than 2.0 meters) and are normally covered with vegetation, which prevents rapid water exchange with the larger area of the lake and limits the air/water gas exchange. Plant respiration (samples were often taken in the morning hours) and sediment oxygen demand also contributed to the low DO saturation values. Staff considers this a natural condition for Lake Iamonia.

Fish Consumption Advisory

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

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

Floral Assessment

The Lake Vegetation Index score for Lake Iamonia was 62, placing the lake's vegetative community in the healthy category.

Forty-three species were found during the survey (**Table 2**). The native species, fragrant water lily (*Nymphaea odorata*) and fanwort (*Cabomba caroliniana*) were the most dominant species. Other species include red maple (*Acer rubrum*), maidencane (*Panicum hemitomon*), water shield

(*Brasenia schreberi*), and American lotus (*Nelumbo lutea*).

The exotic hydrilla (*Hydrilla verticillata*), and water hyacinth (*Eichhornia crassipes*), both listed as Category I Invasive Exotics by the Florida Exotic Pest Control Council, are a concern in Lake Iamonia. Additionally, the exotic water spangles (*Salvinia minima*) and Cuban bulrush (*Oxycaryum cubense*) was found in the lake.

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

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

Other Parameters

As **Figure 3** shows, biochemical oxygen demand (BOD) levels have and continue to fluctuate over time. As mentioned previously, Lake Iamonia is relatively shallow: average bottom depth in 2023 was 1.48 meters. The large amount of naturally occurring coarse particulate organic material (CPOM) on the lake bottom is more readily disturbed by wind and wave action in a system as shallow as Lake Iamonia. This led the CPOM to resuspend in the water column, leading to an increase in potential microbial activity (i.e. higher BOD levels).

Other parameters appeared to be normal for the area and no other impairments were noted.

Conclusions

Based on ongoing sampling, Lake Iamonia met the nutrient thresholds for the East Panhandle Region. DO criteria were not met, but staff considers the low DO results a natural condition.

BOD levels continue to fluctuate. The large amount of naturally occurring CPOM on the lake bottom is more readily disturbed by wind and wave action in shallower systems. The shallow water levels led to CPOM resuspending in the water column, leading to an increase in BOD levels.

The LVI score placed the lake’s vegetative community in the Healthy category.

Other parameters appeared normal for the area and no other 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 Sites IA2, IA4, IA6, IA7, IA8 and LI1B.](#)

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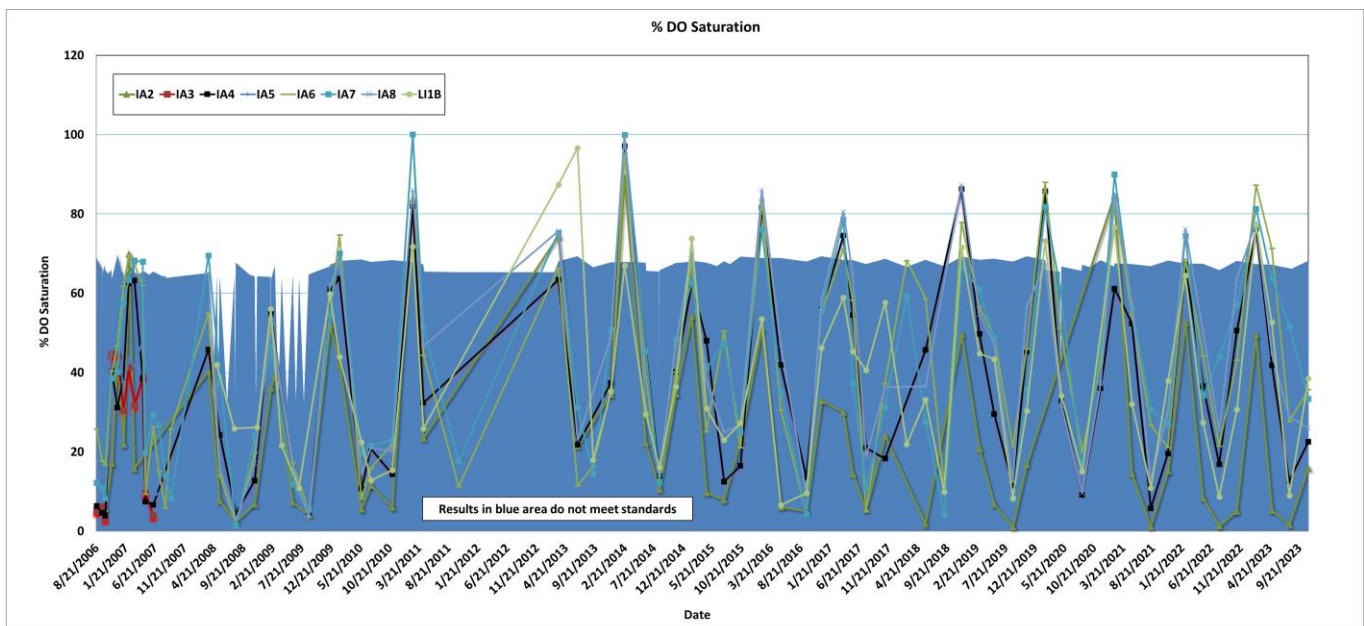


Figure 2. Dissolved Oxygen Percent Saturation results for Lake Iamonia.

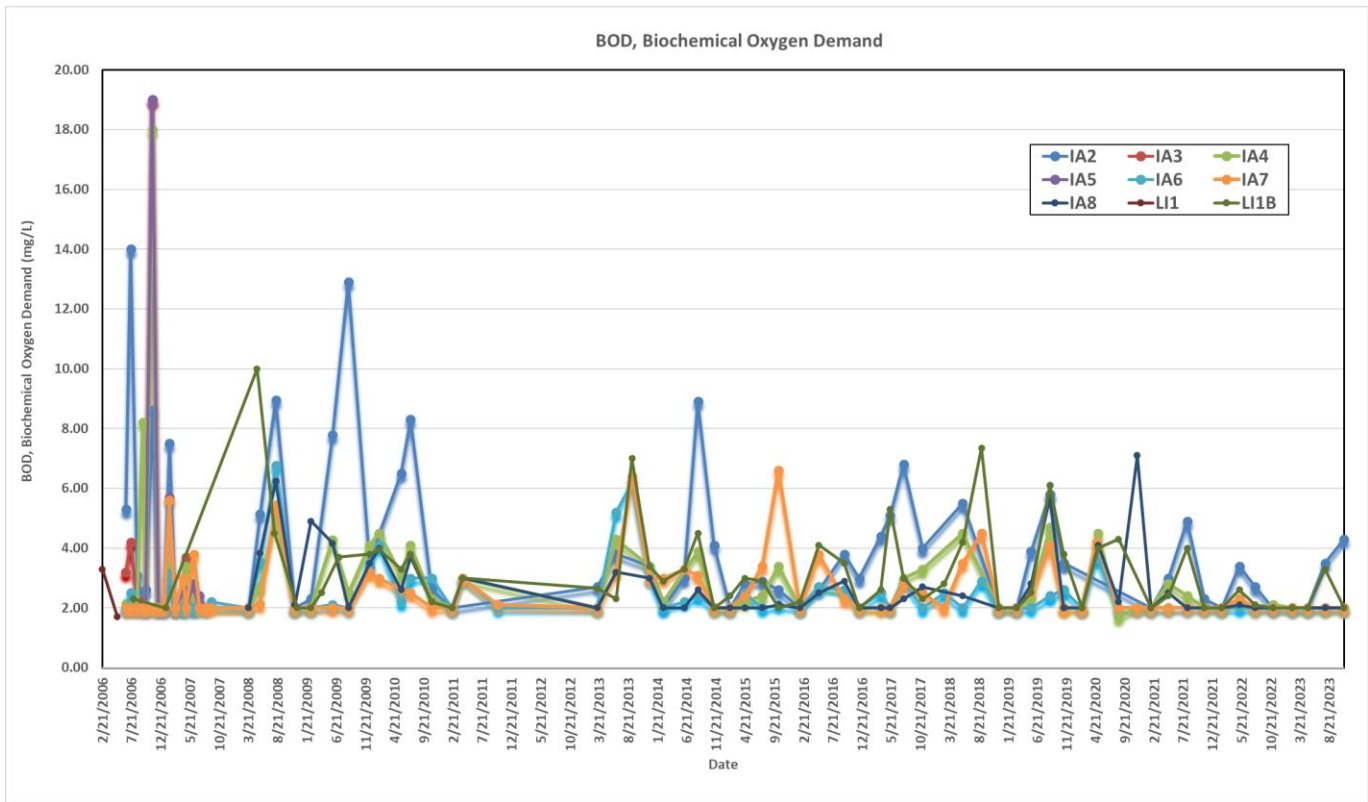


Figure 3. Biochemical Oxygen Demand (BOD) results for Lake Iamonia.