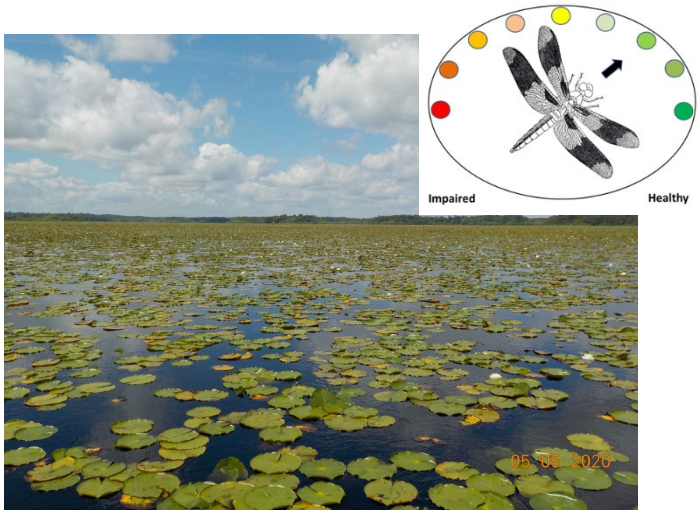
Waterbody: Lake Iamonia

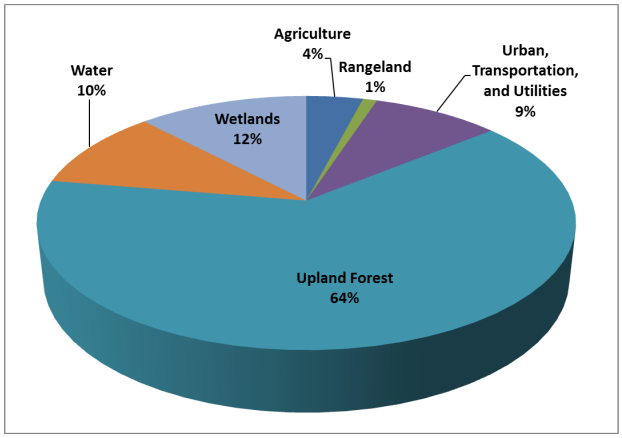


Basin: Lake Iamonia

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 overabundance of aquatic plants and the accumulation of organic sediment in Lake Iamonia which impede recreational usage and 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, with the latest being 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.

As shown in the following pie chart, approximately 14% of land use in the 66,727-acre Lake Iamonia basin is agriculture, rangeland, urban, utilities or transportation. 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 nuisance exotic plants and animals. 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 and sediment sampling were conducted to determine the health of Lake Iamonia and met the requirements of the Florida Department of Environmental Protection (FDEP).

Results

Dissolved Oxygen (DO)

As Figure 1 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.

Nutrients

During the sampling period (2004-2020), several stations were inaccessible due to drought. Sinkhole activity and drought prevented staff from collecting samples in 2012. When viewing tables and figures, the absence of data means there was not enough data collected (due to lack of water) to fulfill data requirements.

The nutrient thresholds and results are found in Table 1. Due to low water conditions, FDEP data requirements for the Numeric Nutrient Criteria could not be met for 2011 through 2012.

While state numeric nutrient criteria were not exceeded during the period of record, the elevated chlorophyll-*a* results in 2013 and 2015 should be noted.

During the August 2020 sampling event, the chlorophyll-*a* level (27.7 µg/L) at station LI1B was extremely high for this lake. Other stations during the same event ranged from 2.7 to 5.3 µg/L. It is unknown why the chlorophyll-*a* level varied so much from the other stations.

Table 1. FDEP's chlorophyll-*a*, total nitrogen and phosphorus criteria for lakes applied to Lake Iamonia. Due to low water, the numeric nutrient criteria data requirements could not be calculated for years 2011-2012.

Colored Lakes	Chlorophyll-*a* 20.0 µg/L	Total Nitrogen Threshold 1.27-2.23 mg/L	Total Phosphorus 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	14.52	0.72	0.04
2014	3.26	0.75	0.03
2015	15.4	0.61	0.04
2016	8.8	0.60	0.02
2017	7.1	0.60	0.02
2018	6.8	0.60	0.03
2019	6.2	0.50	0.02
2020	4.5	0.50	0.02

Other Parameters

As Figure 2 shows, biochemical oxygen demand (BOD) levels have and continue to fluctuate over time; 2020 levels ranged from detection levels (normally 2.0 mg/L) to a high of 7.1 mg/L at station IA8 during the November 2020 sampling event. As mentioned previously, Lake Iamonia is relatively shallow: average bottom depth in 2020 was 1.06 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.

Chlorophyll-*a* levels were extremely elevated at one station during the August 2020 sampling event. It is unknown at the reason behind this elevated level.

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 2020.

Click here for a map of the watershed – Sample Sites IA2, IA4, IA6, IA7, IA8 and LI1B.

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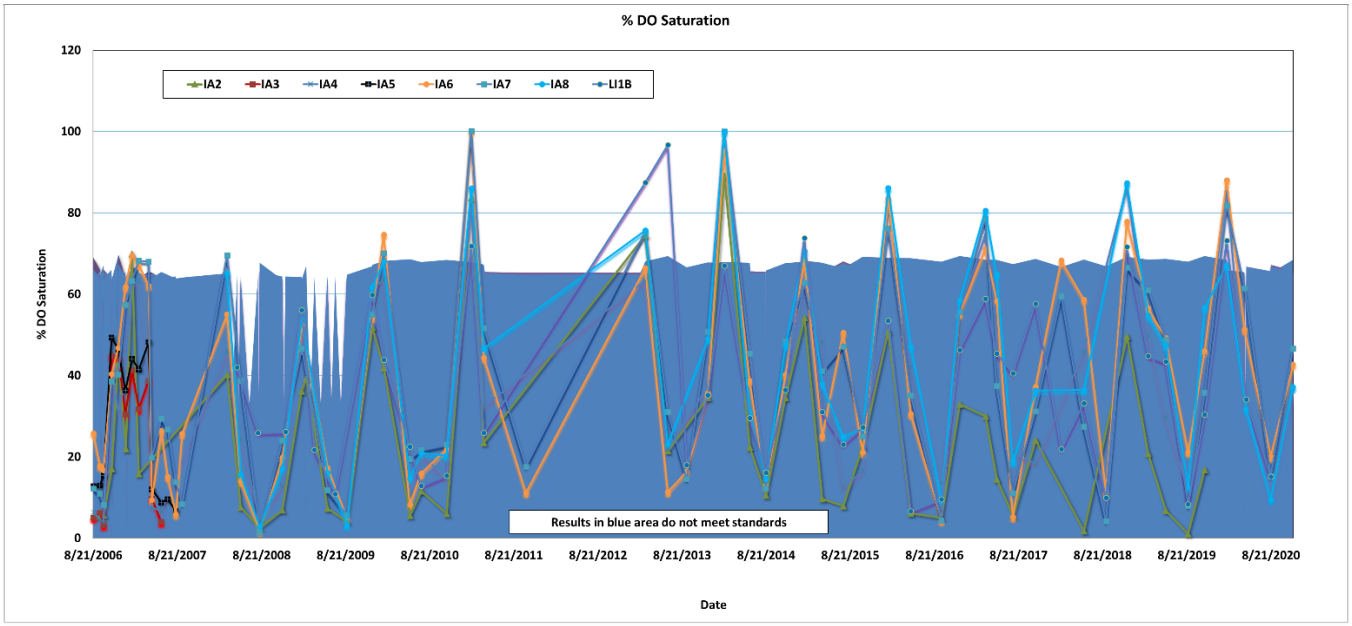

Figure 1. Dissolved Oxygen Percent Saturation results for Lake Iamonia.

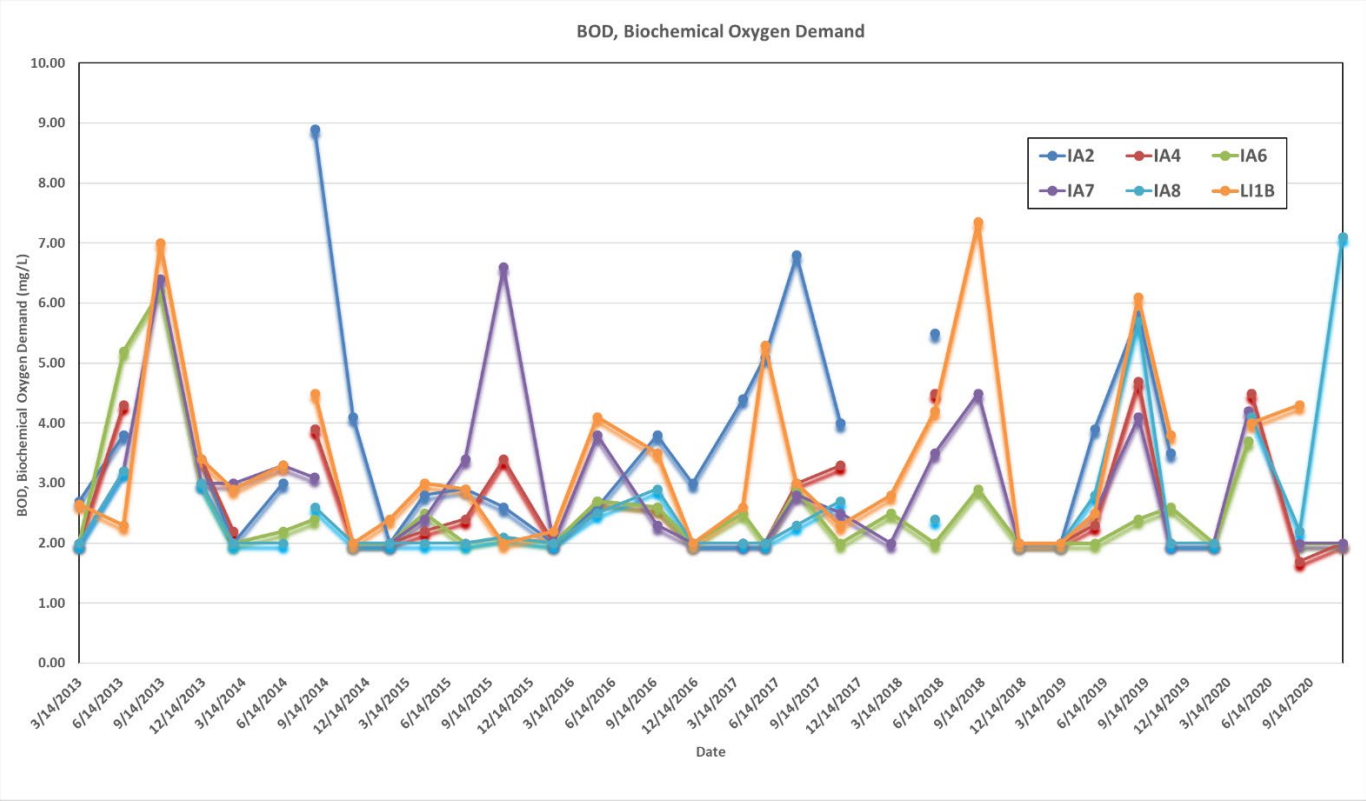

Figure 2. Biochemical Oxygen Demand (BOD) results for Lake Iamonia.