2025 Lakes Monitoring Annual Report

Lake Piney Z

Lake Piney Z is located along the eastern portion of the Tallahassee city limits. Lake Piney Z is within the Lafayette drainage basin.

- Lake Piney Z Physiographic Province: Munson Sandhills
- Lake Piney Z is a recreational favorite for fishing, canoeing, kayaking & hiking
- Publicly Accessible: Yes
- Surface Area: 240 acres
- Drainage Basin: 415 acres
- Maximum Depth: 8 feet
- Average Depth: 5 feet
- Trophic Classification: Eutrophic
- Fish Consumption Advisories: Yes, Mercury: (Largemouth Bass, Red Sunfish, Brown Bullhead Catfish, Bluegill, Warmouth)
- Lake Type: Clear-Acidic
- Water Quality Conditions: Marginal
- Water Quality Impairments: Chlorophyll *a*, Total Nitrogen (TN), Total Phosphorus
- Biological Health: Healthy

Evaluation of Lake Health

Healthy lake systems often exhibit well-balanced populations of flora and fauna. While some level of disturbance can be tolerated, excessive human activities may result in lake degradation. Human stressors such as increased inputs of nutrients, sediments and pesticides from watershed runoff, undesirable removal of native shoreline and upland buffer vegetation, and introduction of nuisance (generally exotic) plants and animals all contribute to degradation of our water resources. The Florida Department of Environmental Protection (FLDEP) has methods to evaluate if these anthropogenic activities have resulted in conditions where a particular waterbody has exceeded water quality criteria, (Chapter 62-302, Florida Administrative Code), including whether adverse impacts to biological communities have occurred. The most common criteria used by FLDEP to determine lake health is called "Numeric Nutrient Criteria" (NNC). FLDEP water quality standards are designed to protect the designated uses of waters of the state (*e.g.,* recreation, aquatic life support). This criterion will show exceedances of these standards that may impede the designated use of a particular waterbody. The Numeric Nutrient Criterion primarily evaluates Chlorophyll-*a*, total nitrogen, and total phosphorus. Chlorophyll-*a* is a measure of algal biomass in a water column and is generally found in higher concentrations as a response to increased levels of nitrogen and/or phosphorus. In clear, low alkalinity lakes (a lake where color is ≤ 40 PCU and the alkalinity is ≤ 20 mg/L CaCO3), a healthy system is expected to have < 6 µg/L of chlorophyll-a. In colored (> 40 PCU) lakes or clear, high alkalinity (>20 mg/L CaCO3) lakes, healthy systems are expected to have < 20 µg/L of chlorophyll-a. Chlorophyll-a values greater than those referenced may result in unwanted shading of aquatic plants and/or greater potential for harmful algal blooms. **Table 1** below represents the FLDEP Numeric Nutrient Criteria for Florida lakes.

Table 1. Florida Numeric Nutrient Criteria

Long Term Geometric Mean Lake Color and Alkalinity	Annual Geometric Mean Chlorophyll *a*	Minimum calculated numeric interpretation		Maximum calculated numeric interpretation	
		Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen	Annual Geometric Mean Total Phosphorus	Annual Geometric Mean Total Nitrogen
> 40 Platinum Cobalt Units	**20 µg/L**	**0.05 mg/L**	**1.27 mg/L**	**0.16 mg/L[1]**	**2.23 mg/L**
≤ 40 Platinum Cobalt Units and > 20 mg/L $CaCO_3$	**20 µg/L**	**0.03 mg/L**	**1.05 mg/L**	**0.09 mg/L**	**1.91 mg/L**
≤ 40 Platinum Cobalt Units and ≤ 20 mg/L $CaCO_3$	**6 µg/L**	**0.01 mg/L**	**0.51 mg/L**	**0.03 mg/L**	**0.93 mg/L**

From a biological perspective on lake health, the Lake Vegetation Index (LVI) is utilized as the primary bioassessment tool. This rapid field method was developed by FLDEP to assess the lake's plant community.

When performing a LVI assessment, the lake is divided into twelve sections (see **Figure 2**) with four of the sections randomly selected for evaluation during the annual monitoring event where the percent native species, percent invasive exotic species, percent sensitive species, and the coefficient of conservatism (C of C; a measure of how tolerant a species is to disturbance) of the dominant species are assessed resulting in a score. According to DEP SOP LT 7000, the LVI score ranges and categories are: (78-100) Exceptional; (43-77) Healthy; and (0-42) Impaired. DEP's revised impairment threshold score of 43 and higher fully meet the expectation of a healthy, well-balanced community, and scores below42 are considered impaired. The LVI was

sampled per DEP SOP FS7310 and calculated per DEP SOP LT7000.

Lake Piney Z maintains a consistent permanent pool of water, which is conducive to water quality and biological monitoring activities. As such, annual water quality data is available for Lake Piney Z dating back to 1992 and biological monitoring has occurred since 2001**.** The following tables and charts provide water quality (annual geometric means) and biological results covering the time-period of 2011-2024. **Figures 1 & 2** display the water quality and biological monitoring locations within Lake Piney Z.

Figure 1. Water Quality Monitoring Locations

Table 2. Water Quality Annual Geomeans

Lake Piney Z Yearly Geomeans FLDEP Nutrient Criterion Parameters & Biological Health						
Year	Chlorophyll *a* *	Color	Alkalinity	TN *	TP*	LVI
2011	33	38	7	1.07	0.060	61
2012	25	38	8	0.72	0.050	56
2013	12	38	9	0.55	0.040	58
2014	13	38	7	0.75	0.050	
2015	8	29	6	0.57	0.030	57
2016	19	19	7	0.76	0.030	
2017	11	20	8	0.64	0.050	56
2018	14	12	7	0.49	0.030	
2019	8	10	6	0.89	0.070	55
2020	14	19	6	0.72	0.020	
2021	16	14	9	0.64	0.040	44
2022	18	15	15	0.73	0.040	49
2023	22	11	9	0.77	0.044	54
2024	21	12	8	0.59	0.044	39
Years 2014 ,2016, 2018 LVI's were omitted. Year 2020 Covid Pandemic canceled LVI.						

Chart 1. Color

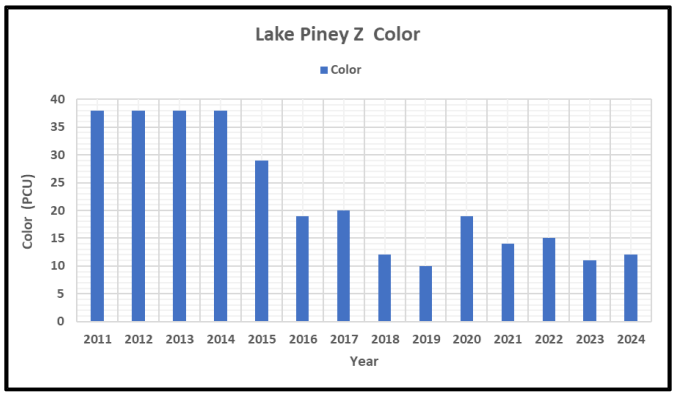


Chart 2. Alkalinity

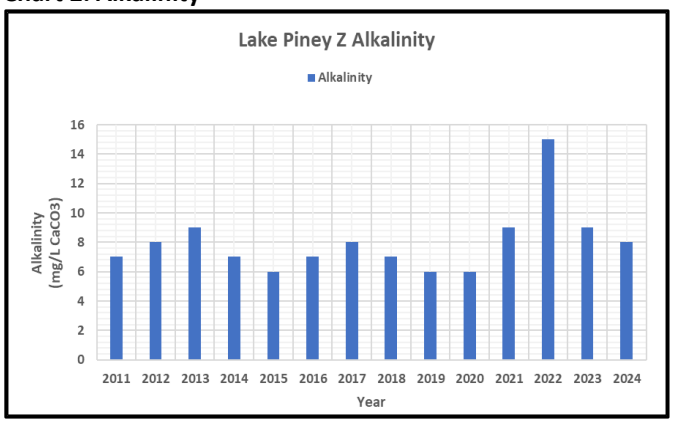


Chart 3. Chlorophyll

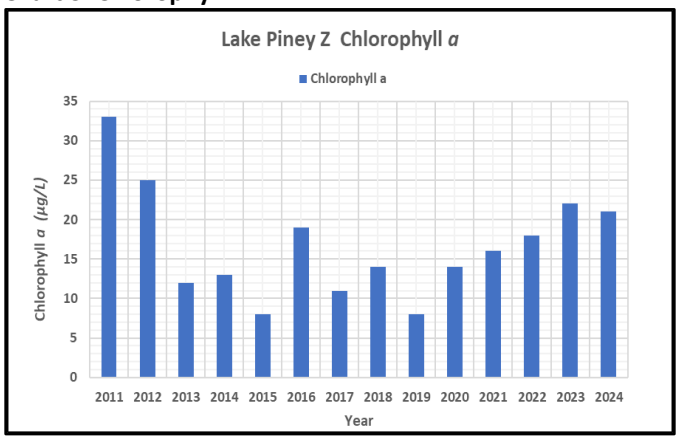


Chart 4. Total Nitrogen

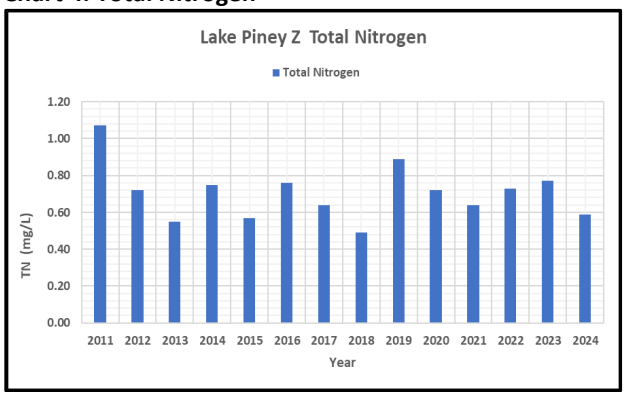


Chart 5. Total Phosphorus

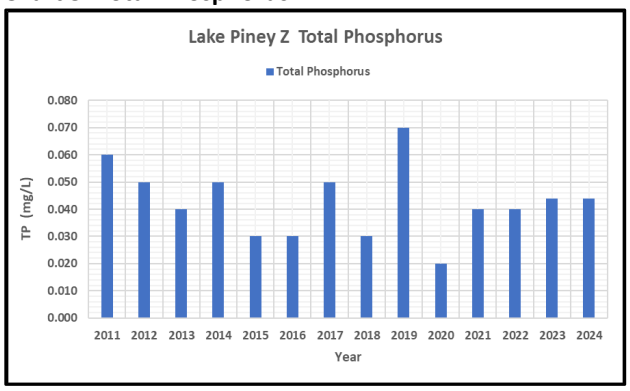


Figure 2. Biological Monitoring

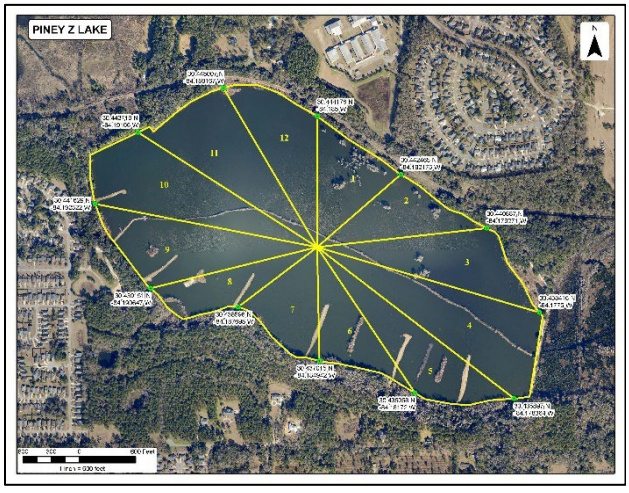


Chart 6. Biological LVI Species List for Year 2024

Lake Piney Z Year 2024	Score 39	Sections			
Scientific Name	Common Name	3	6	9	12
Acer rubrum	RED MAPLE		P	P	P
Alternanthera philoxeroides	ALLIGATORWEED		P	P	
Baccharis halimifolia	FALSEWILLOW	P			
Bacopa caroliniana	LEMON BACOPA	P		P	P
Boehmeria cylindrica	BOG HEMP	P			
Brasenia schreberi	WATERSHIELD	P	P	P	P
Cephalanthus occidentalis	COMMON BUTTONBUSH	P	P	P	P
Ceratophyllum demersum	COONTAIL	P			
Colocasia esculenta	ELEPHANT EAR, WILD TARO	C	P	P	D
Cyperus odoratus	FRAGRANT FLATSEDGE	P			
Eichhornia crassipes	WATER HYACINTH		P	P	P
Eupatorium capillifolium	DOGFENNEL			P	
Hydrocotyle sp.	MARSHPENNYWORT	P			
Ipomoea sp.	MORNING GLORY	P		P	P
Juncus effusus	SOFT RUSH	P		P	P
Limnobium spongia	AMERICAN SPONGEPLANT; FROG'S-BIT	P	P		
Liquidambar styraciflua	SWEETGUM	P	P	P	P
Ludwigia leptocarpa	ANGELSTEM PRIMROSEWILLOW	P	P	P	P
Ludwigia octovalvis	MEXICAN PRIMROSEWILLOW	P	P		
Mikania scandens	CLIMBING HEMPVINE	P	P	P	P
Nelumbo lutea	AMERICAN LOTUS	P	P	P	P
Nymphaea odorata	AMERICAN WHITE WATERLILY	P	D	C	P
Oxycaryum cubense	CUBAN BULRUSH	P	P	P	P
Panicum repens	TORPEDO GRASS	P	P	P	P
Persicaria glabra	DENSEFLOWER KNOTWEED	C	P	P	P
Persicaria hydropiperoides	MILD WATERPEPPER; SWAMP SMARTWEED			P	
Pontederia cordata	PICKERELWEED	P	P	P	P
Sacciolepis striata	AMERICAN CUPSCALE	P	P	P	P
Sagittaria filiformis	THREADLEAF ARROWHEAD	P			
Sagittaria latifolia	COMMON ARROWHEAD; DUCK POTATO	P	P		
Salix caroliniana	CAROLINA WILLOW; COASTALPLAIN WILLOW		P	P	P
Sambucus nigra	ELDERBERRY			P	P
Sapium sebiferum	CHINESE TALLOW	P	P	C	
Sesbania	SILKY SESBAN	P			
Solidago	GOLDEN ROD			P	
Taxodium	BALD-CYPRESS	P	P	P	P
Typha c.f. *latifolia*	BROADLEAF CATTAIL	P	P	P	P
Utricularia foliosa	LEAFY BLADDERWORT		P		

Data Discussion

The data within the above charts and tables is used to determine overall lake health and to assess whether any existing data trends are evident. The Lakes Monitoring Program utilizes the Mann-Kendall Statistical Trend Analysis to determine if there are trends that are statistically significant. There are no significant trends, either increasing or decreasing, for any of the water quality parameters illustrated in the charts.

The water quality and biological health within Lake Piney Z can be best characterized as “marginal”. The lake is impaired for Chlorophyll *a,* Total Nitrogen and Total Phosphorus as annual geometric means exceed the FLDEP criteria for a “clear, acidic” lake. However,

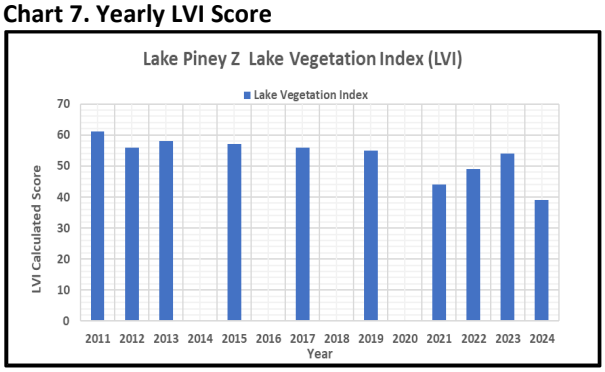
the lake is an identified "fish management area" by the Florida Fish & Wildlife Conservation Commission (FWC) and managed as such. Lake Piney Z supports a diverse fishery highlighted by trophy largemouth bass, large bream and black crappie as evidenced by **Photos 1 & 2**, which were taken during a routine fish survey on the lake.

Photos 1 & 2 respectively below.

Lake Piney Z's vegetation community has a broad diversity structure of native plant species. The 2024 overall LVI calculated score was "39", which indicates it's an "Impaired" plant community. However, recall the LVI survey is completed for only one-third of the lake. Unfortunately for 2024, the quadrants consisted of dominating invasive exotics plants. "Elephant Ear" (*Colocasia esculenta)* was the "dominant" taxon in one area and a "co-dominant" taxon in another surveyed section. Other invasive plants such as Water hyacinth (*Eichornia crassipes*), Chinese Tallow (*Sapium sebiferum*) and Torpedo Grass (*Panicum repens*) were observed. These significantly lower the LVI score for the lake and is not indicative of the lake as a whole where many other sections are undergoing a resurgence of quality native plants re-establishing within the littoral zone. Also, many floating and submerged plants are making a comeback, now that the triploid carp are dying off. As shown in **Chart 7**, the LVI score has been improving since 2021 with the exception being the 2024 survey.

The overall number of taxa was down seven species in 2024 (40 species) from (47 species) last year in 2023.

Chart 7. Yearly LVI Score



Photos 3 & 4 show the natural beauty and native plants that can be found at Lake Piney Z.

Thank you for your interest in the water quality of City of Tallahassee area lakes. Visit the web-links below for more information on the City of Tallahassee, Leon County, and Florida natural water resources.

City of Tallahassee Think About Personal Pollution (TAPP) Program
https://tappwater.org/

City of Tallahassee Stormwater Management
https://www.talgov.com/you/stormwater

Leon County Water Resources
https://cms.leoncountyfl.gov/waterresource

Best Management Practices for Protection for Water Resources
https://ffl.ifas.ufl.edu/media/fflifasufledu/docs/GIBMP_Manual_Web_English.pdf

DEP biological assessment resources:
https://floridadep.gov/dear/bioassessment/content/bioassessment-training-evaluation-and-quality-assurance#LVI

FWCC Aquatic Plant Management:
http://myfwc.com/wildlifehabitats/habitat/invasive-plants/aquatic-plant/

Freshwater Algal Bloom information:
https://floridadep.gov/AlgalBloom

University of Florida / IFAS Lake Resources:
Florida LAKEWATCH