Jose Lake
Iosco County, T24N, R05E, Sections 9, 10, 16
Au Sable River watershed, last surveyed 2018

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Environment

Jose Lake is a 129-acre natural lake located approximately three miles northeast of the town of South Branch, Michigan in northwestern Iosco County (Figure 1 and 2). There is no known inlet or outlet for this lake. Jose Lake is a relatively shallow water body with high water clarity. The lake has two main basins, with the deepest spot being approximately 25 feet in the southern main basin (Figure 3).Bottom substrate is primarily sand, peat, marl, and some gravel. Invasive zebra mussels have been found in the lake since approximately 2008. A temperature and dissolved oxygen profile was measured by Michigan Department of Natural Resources (MDNR) personnel in late-August 2018 (Table 1). The lake showed little thermal stratification of the water column, with dissolved oxygen levels suitable to fish nearly down to the bottom. A non-improved boat launch can be found as a township owned road ending which is primarily maintained by the Jose Lake Association with permission from the township. The lake association has been attempting to eradicate Eurasian water milfoil through professional chemical application on an annual basis since 2012.

History

The history of fisheries and aquatic management at Jose Lake is not extensive but dates back to the 1920s. The Michigan Department of Conservation (MDOC) initially examined the lake in August with the use of gill nets and seining efforts. The species collected were Bluegill, Yellow Perch, Largemouth Bass, Northern Pike, and various shiners and minnow species. The water was considered very clear with varying amounts of aquatic vegetation throughout the lake. The one recommendation from the survey was to stock Smallmouth Bass.

A more comprehensive aquatic survey was completed by MDOC at Jose Lake in July 1949. Surveyors found a lake that had relatively little thermal stratification and low dissolved oxygen near the lake bottom. It was considered a "semi-private" lake since it had marginal public access. There were 150 cottages on the lake and there was no lake inlet or outlet. Bottom substrate consisted of peat, marl, sand, and some gravel. MDOC used gill-netting and seining to examine fish species and found Bluegill, Yellow Perch, Rock Bass, and Largemouth Bass common. Walleye were caught in low numbers, while Pumpkinseed and Northern Pike were less common.

The first known stocking records for Jose Lake date back to the 1930s. Walleye fry and juvenile perch were stocked on various occasions from 1937 through 1942 by MDOC. The same agency stocked Rainbow Trout in the lake in 1959 and Brown Trout in 1974. The Jose Lake Association has stocked variable numbers of fingerling or juvenile Walleye, Black Crappie, Yellow Perch, Bluegill, and Redear Sunfish in the lake between 2013 and 2018.

The reason the Michigan Department of Natural Resources (MDNR) conducted a fish community survey on Jose Lake in 2018 was because: 1) a Status and Trends survey was being conducted on

adjacent Chain Lake and enabled us to complete surveys on both lakes, and 2) the lake association had been stocking the lake with low numbers of various species and had questions regarding their efforts.

Current Status

A recent fish management survey was completed on Jose Lake by the Michigan Department of Natural Resources Fisheries Division in late-May 2018. This survey was completed to collect recent information on the fish community and to evaluate private stocking efforts. Sampling effort consisted of five large-mesh trap-net lifts, nine large-mesh fyke-net lifts, four small-mesh fyke-net lifts, and two experimental gill-net lifts. All lifts were equal to one overnight set of each gear type. Surface water temperature throughout the three day survey ranged from 61-66 degrees Fahrenheit.

A total of 354 fish were captured from 12 different species during the survey (Table 2). Species diversity was average compared to other northern Michigan lakes. Panfish such as Rock Bass, Bluegill, and Pumpkinseed were common in the catch, while Black Crappie and Yellow Perch were less common. Predator fish such as Northern Pike, Walleye, and Largemouth Bass were considered common, while predators such as Channel Catfish and Smallmouth Bass were rare. Bullheads were found in Jose Lake as they are in most other lakes. Interestingly, White Suckers, common to many Michigan lakes, were not found in Jose Lake. Forage fish such as shiners and minnows were not collected due to the gear used, but are likely found in Jose Lake.

Rock Bass were the most abundant panfish caught in the Jose Lake survey. This is not uncommon for a northern Michigan lake to have a prolific Rock Bass population. Bluegill were the next most abundant panfish, with most fish caugth in the 6-8 inch size range (Table 3). Five year classes of Bluegill were collected (Table 4) and they were found to be fast growing in Jose Lake. Pumpkinseed, which were also fast growing, were also found in a size distribution similar to Bluegill, and were represented by three age classes (Table 4). Small numbers of Black Crappie and Yellow Perch were collected, though good sizes of fish were collected (Table 3). Despite recent stocking efforts, no Redear Sunfish were collected. Stocking efforts of this species in northern Michigan lakes have often failed.

Northern Pike and Largemouth Bass were equally common and both demonstrated very acceptable growth rates (Table 4). Good numbers of legal size (24-inches and larger) Northern Pike were collected, thus the 24-inch minimum size limit seems reasonable. Also, good numbers of legal size (14-inches and larger) Largemouth Bass were found in the survey, with a specimen as large as 19-inches collected (Table 3). Multiple age groups were found within both species. Six age classes of Walleye were collected (Table 4). Walleye growth also appears to be very good in Jose Lake and good numbers of legal size fish (15-inches and larger) were collected.

Analysis and Discussion

The current fish community of Jose Lake can be generally characterized as having the following: 1) a panfish community considered average in diversity, relatively low in abundance, fast growing, and the ability for some individuals to attain large sizes, 2) a predator population showing moderate diversity and excellent growth among the species, 3) a moderate Walleye population that is comprised of many legal fish but of unknown origin (stocked or wild), 4) a non-game fish community typical of that for a northern Michigan lake with the exception that white suckers are uncommon, and 5) a presumed

minnow and shiner community that has not been surveyed, but which is probably typical for a northern Michigan lake with such morphological characteristics.

The Jose Lake panfish community is moderately diverse. Species typically targeted by anglers include Bluegill, Pumpkinseed, Rock Bass, Black Crappie, and Yellow Perch. Abundance of these species has probably changed very little over the last century. Growth for these species ranges from slightly good to excellent when compared to the statewide average for these species. Reproduction levels of panfish are unknown for Jose Lake. Most fish are believed to be self-propagating, although the lake association does supplement with low level panfish stocking efforts.

The predator base of Jose Lake is dominated by Largemouth Bass, Walleye, and Northern Pike. Walleye are occasionally caught by anglers, but their catches are probably incidental on most occasions. Walleye growth is good. It is unknown if stocking is supplementing the Walleye fishery or if natural reproduction is sufficient. Largemouth Bass are abundant and their growth is good. The bass population has a good balance of legal and sub-legal fish. Northern Pike are common. The pike catch is not dominated by sub-legal fish, making it a balanced population.

The non-game fish community is dominated by bullheads. A large Channel Catfish was captured in the recent survey, and was likely a product of fish transfer efforts by the public. No White Suckers were captured in the Jose Lake survey.

Management Direction

1. Jose Lake has a fish community generally typical for a northern Michigan waterbody. The panfish community appeared a bit less abundant than it should have been, but this may be linked to predation from the abundant number of predators in the lake. If anglers/residents want to have more panfish, they may consider less stocking of Walleye fall fingerlings. It might even demonstrate that natural reproduction can sustain the small fishery, or at least a small Walleye population itself. Despite this, recent stocking of fall fingerling Walleye has been well within the recommended stocking range by MDNR (MDNR 2004). Stocking Black Crappie may also not be a good management practice. Black Crappie are highly piscivorous after their juvenile stages and will feed heavily on the young of other desirable panfish. Thus, the number of desirable species they prey on may not be equally balanced by the amount of biomass they provide as a fishery. Redear Sunfish were stocked in the past, but none were captured in the survey. Experiments have been attempted to stock this species in other northern Michigan lakes over the decades, but have had no success. Though this is an attractive panfish, it simply cannot survive in the unproductive natural lakes of northern Michigan, and efforts to stock them should be terminated permanently.

2. Regardless of what is stocked, the lake association should continue to consult the local MDNR Fisheries Biologist on private stocking efforts. Excessive stocking can have negative consequences on some species. At the very least, the lake association should continue to acquire their stocking permits annually though MDNR since they are free and ensure a measure of quality control to species management. Currently, the species are stocked within reasonable numbers and after consultation with a MDNR fisheries biologist. In addition, the lake association should report actual stocking numbers back to the DNR each year for future tracking purposes.

3. Aquatic vegetation control should be evaluated more thoroughly at Jose Lake. Aquatic vegetation is the base of the food chain in Jose Lake, which is generally sterile and unproductive. The lake association suggests that the vegetation control is on non-native milfoil, with some spot treatments for native milfoil. After six years of treatments recently, this program should be evaluated for effectiveness.

4. The best way for anglers to determine the value of their stocking efforts is to ask anglers. Fish stocking can be expensive, and should be evaluated the same way one may evaluate purchasing something for a household. There is some simple information that can be gathered from residents and local anglers as to the effectiveness of the stocking efforts. This information can be ascertained through discussions with the local MDNR fisheries biologist.

References

MDNR (Michigan Department of Natural Resources). 2004. Introduction to Michigan fish stocking guidelines. Chapter 1 in Dexter, J.L., Jr., and R.P. O'Neal, editors. Michigan fish stocking guidelines II: with periodic updates. Michigan Department of Natural Resources, Fisheries Special Report 32, Ann Arbor.

Figure 1. General location of Jose Lake in the northern Lower Peninsula of Michigan indicated by arrow.

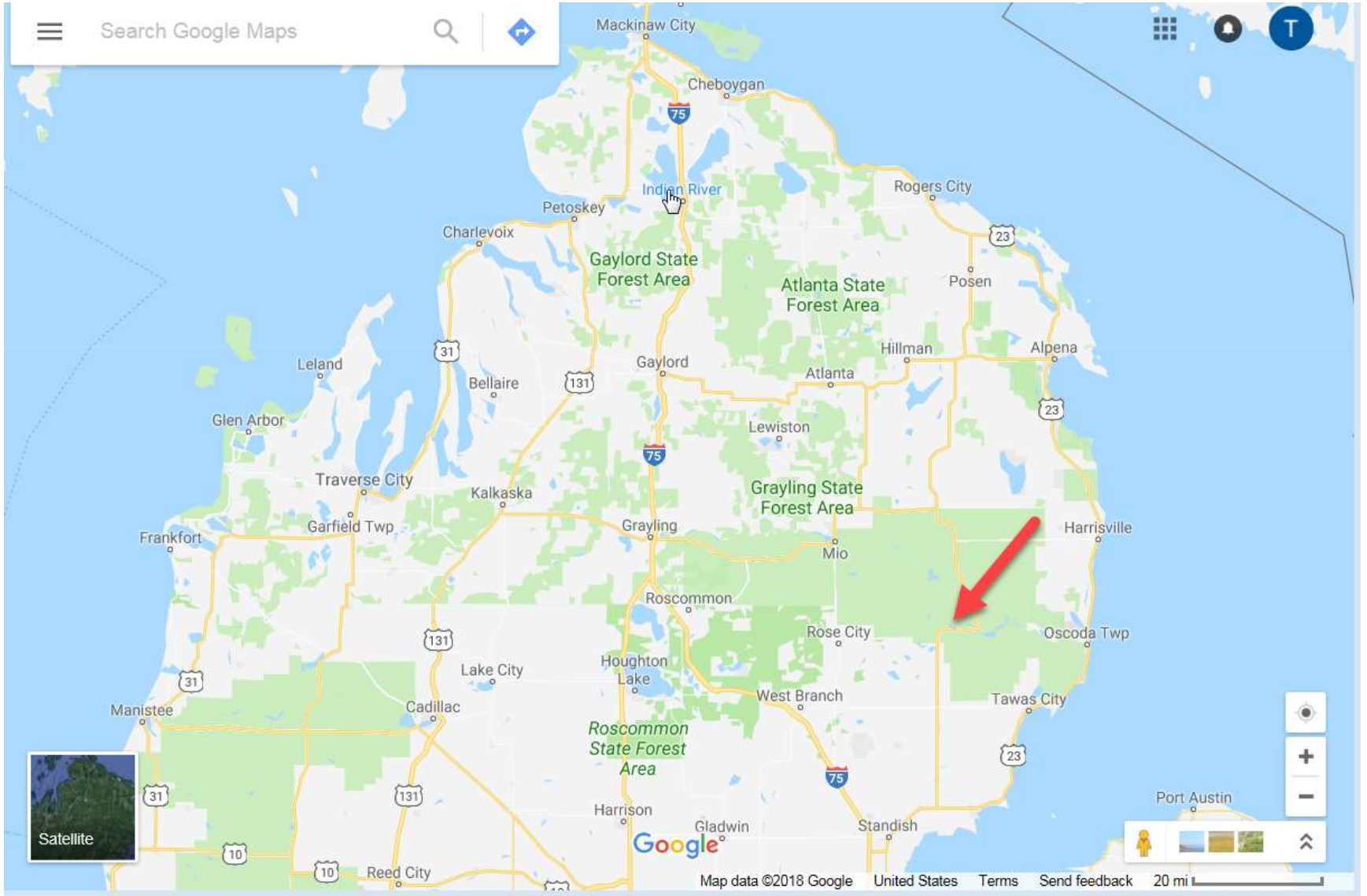

Figure 2. Jose Lake and surrounding area in Iosco County.

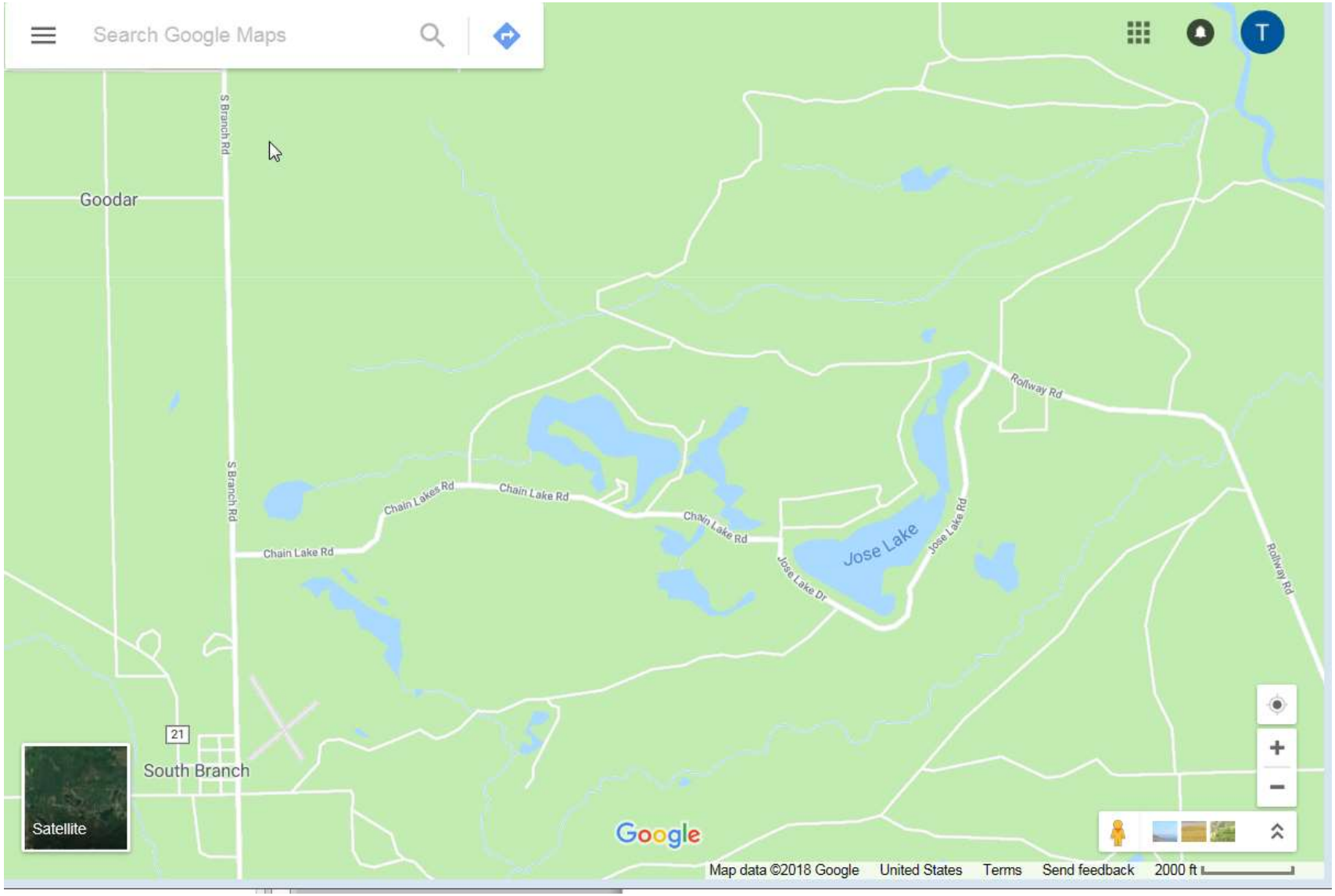

Figure 3. Original bathymetric map for Jose Lake.

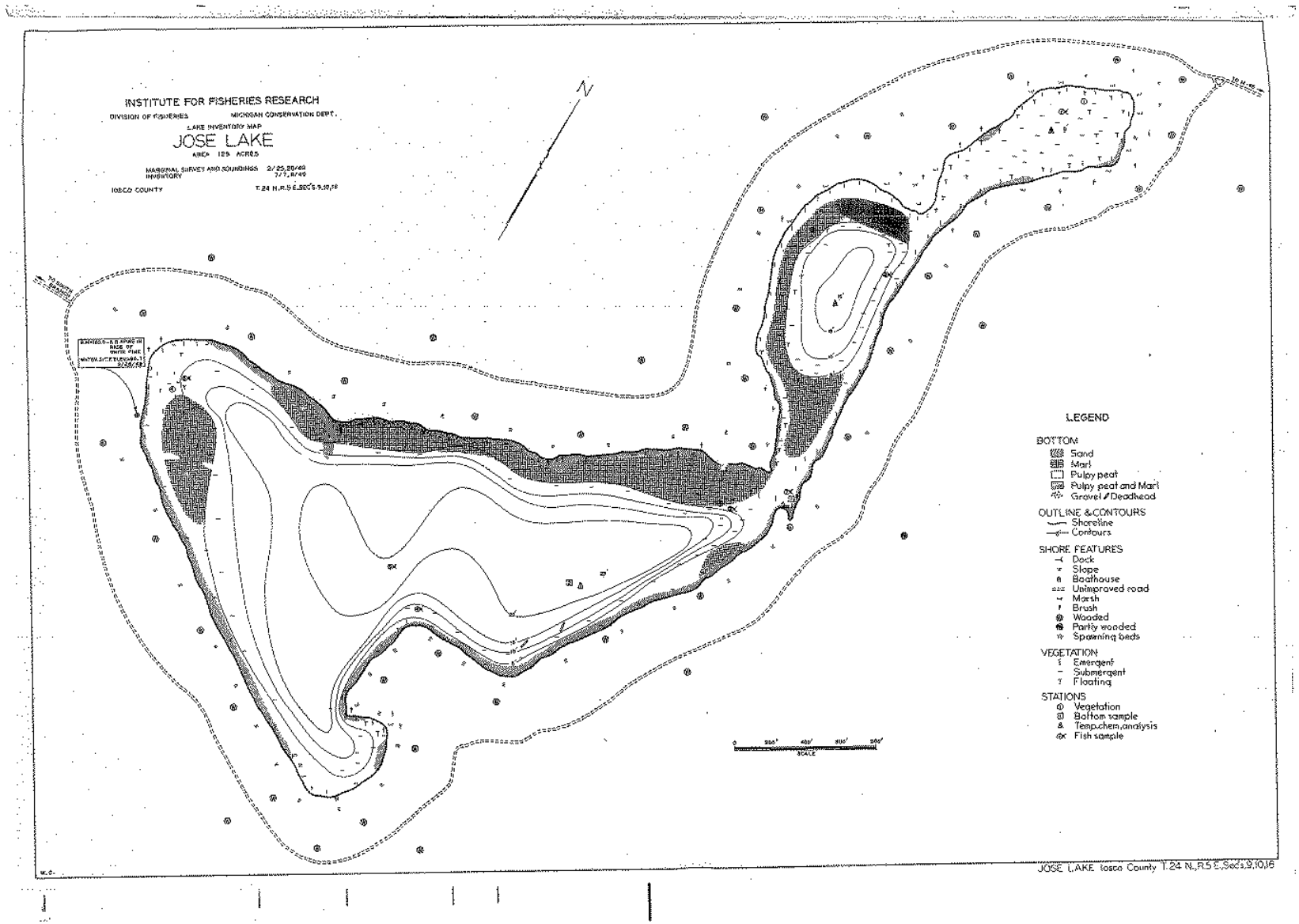

Table 1. Water temperature and dissolved oxygen profile for Jose Lake, August 28, 2018.

Depth (ft)	Temperature (F)	Dissolved Oxygen (ppm)
Surface	75	8.1
2	75	8.1
4	75	8.0
6	75	8.0
8	75	8.0
10	75	8.1
12	75	8.0
14	75	8.1
16	75	8.1
18	75	7.1
20	74	6.8
22	72	0.0
24	68	0.0

Table 2.-Species and relative abundance of fishes collected with survey gear at Jose Lake, May 21-24, 2018.

Common Name	Number	Percent by number	Length Range *(inches)*	Weight (lbs)*	Percent by weight	Growth** (inches)
Rock Bass	169	47.7	3-10	61.9	19.1	
Bluegill	52	14.7	5-9	18.1	5.6	+1.4
Brown Bullhead	33	9.3	8-14	25.9	8.0	
Pumpkinseed	28	7.9	4-10	13.6	4.2	+2.2
Northern Pike	22	6.2	19-33	87.2	26.9	+1.3
Largemouth Bass	21	5.9	8-19	37.9	11.7	+1.5
Walleye	20	5.6	14-25	51.9	16.0	+2.2
Black Crappie	3	0.8	6-12	2.4	0.7	
Yellow Perch	3	0.8	6-9	0.7	0.2	
Black Bullhead	1	0.3	10	0.6	0.2	
Channel Catfish	1	0.3	39	23.2	7.1	
Smallmouth Bass	1	0.3	12	1.0	0.3	
TOTAL	354			324.3		

* calculated based on length-weight relationships

**based on a comparison to statewide growth for that species (inches)

Table 3.-Length-frequency distribution of certain game fishes collected during the late-May 2018 survey at Jose Lake.

Length (in)	Bluegill	Black Crappie	Pumpkinseed	Largemouth Bass	Northern Pike	Walleye
1						
2						
3						
4						
5	3		1			
6	10	1				
7	16		11			
8	18		13	1		
9	5		2			
10			1	2		
11				1		
12		2				
13				1		
14				3		1
15				8		2
16				3		1
17				1		
18						2
19				1	1	5
20					1	5
21					1	1
22					1	1
23					2	1
24					5	
25					5	1
26						
27					2	
28						
29						
30					2	
31						
32					1	
33					1	

Table 4. Weighted mean length and age composition of selected species in the Jose Lake survey, May 2018.

Species/Age	No. Aged	Length range (in.)	State avg. length (in.)	Weighted mean length (in.)	Weighted age freq.
Bluegill					
III	5	7.0 – 7.8	5.0	7.4	15.38
IV	13	5.9 – 8.8	5.9	7.7	40.67
V	9	5.2 – 9.1	6.7	7.0	21.19
VI	3	6.0 – 9.0	7.3	7.0	6.41
VII	6	8.0 – 9.7	7.8	8.6	16.35
Pumpkinseed					
IV	14	5.5 – 8.4	5.6	7.8	59.31
V	9	7.1 – 9.0	6.2	8.4	37.12
VI	1	10.1	6.6	10.1	3.57
Largemouth Bass					
II	3	8.8 – 10.9	7.1	10.1	14.29
III	1	11.1	9.4	11.1	4.76
IV					
V	7	13.5 – 15.4	13.2	14.8	33.33
VI	7	15.2 – 17.4	14.7	15.9	33.33
VII	2	16.7 – 16.9	16.3	16.8	9.52
VIII	1	19.4	17.4	19.4	4.76
Northern Pike					
II	4	19.0 – 23.9	17.7	21.2	19.05
III	3	22.6 – 24.0	20.8	23.5	14.29
IV	8	23.1 – 25.2	23.4	24.6	38.10
V	4	25.5 – 30.0	25.5	27.53	19.05
VI					
VII					
VIII	1	30.7	31.2	30.7	4.76
IX	2	33.0 – 33.2	--	33.1	4.76
Walleye					
IV	4	19.1 – 20.6	15.8	19.8	26.47
V	5	18.3 – 20.9	17.6	19.8	32.35
VI	1	16.7	19.2	16.7	5.88
VII	3	20.6 – 23.4	20.6	21.7	17.65
VIII	2	18.9 – 22.2	21.6	20.5	11.76
IX					
X					
XI					
XII					
XIII	1	25.5	--	25.5	5.88
Yellow Perch					--
IV	1	9.5	7.5	9.5	
V	1	8.4	8.5	8.4	
Smallmouth Bass					--

III	1	12.2	10.8	12.2	
Black Crappie					--
III	1	11.9	7.5	11.9	
IV	1	12.5	8.6	12.5	