

## **Roberts Lake**

Cheboygan County, T35N, R2W, Section 28  
Cheboygan River watershed, last surveyed 2014

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### **Environment**

Roberts Lake is a small impoundment, or flooding, located approximately four miles southeast of Indian River, Michigan within the Cheboygan River watershed (Figure 1). It is entirely surrounded by public land, which is administered by the Michigan Department of Natural Resources (MDNR). The outlet of Roberts Lake is a small tributary which flows into Crumley Creek, which in turn flows into the Little Sturgeon River, a tributary to the Indian River. The lake is approximately 54 acres in size, yet the deepest location is only about five feet deep (Figure 2). It has also been known as South Twin Lake.

Roberts Lake water levels are regulated by a spillway on the south end (see Photos). The spillway and levee were constructed in 1948 by Michigan Department of Conservation (MDOC) and to this day are maintained by MDNR Fisheries Division. The earthen embankment has a structural height of 7 feet, and a hydraulic height of 6.1 feet. The 300-foot long embankment has a crest width of 12 feet and 3:1 vertical slopes. Impoundment levels are controlled by a 13-foot wide concrete spillway controlled by two 6-foot stop log bays. The dam is inspected every five years by a licensed engineer with the Michigan Department of Environmental Quality (MDEQ) as part of the Dam Safety Program. Typical recommendations associated with these inspections include removing beaver debris at the spillway, removing brush on the faces of the embankment, and less frequently repairing embankment slopes that occasionally erode.

There are no private residences or cottages on the shores of Roberts Lake. No formal boat launches exist, although some anglers use the dam embankment to launch boats, while others use an unimproved small launch on the northeast shore of the lake. Dispersed camping is popular around Roberts Lake. The lake riparian area consists of conifer trees with a mixture of hardwood. The lake bottom is primarily composed of detritus. Woody debris is common in the lake, as is aquatic vegetation in the summer months. Fish winterkill may be prevalent at Roberts Lake in harsh winters due to its shallow nature.

### **History**

Fish stocking records date back to 1931 at Roberts Lake. The Michigan Department of Conservation (MDOC) stocked brook trout in the lake from 1931 through 1934; bluegill from 1932 through 1938; yellow perch 1935 through 1939; walleye in 1935; largemouth bass in 1942; and smallmouth bass from 1934 through 1939. This was a period in the early stages of conservation in Michigan when many Michigan lakes were stocked, regardless of the need or suitability for stocking. Hybrid sunfish were also stocked in 1986 following an observed winterkill.

The initial aquatic community survey for Roberts Lake was made in 1945 by MDOC. The aquatic plant and fish community was surveyed, and measurements of water temperature and dissolved oxygen

were made. Largemouth bass, northern pike, yellow perch, bluegill, and pumpkinseed were considered abundant based on seining and gill netting. These species exhibited "good growth and reaching a respectable size". Also present were yellow bullhead, blacknose shiners, bluntnose minnows, banded killifish, and Iowa darters. It was following this survey that recommendations were made to have the lake level raised by installation of a dam at the outlet. This was accomplished in 1948. Since then, many repairs have been made to the control structure.

Fish winterkills have been noted on many occasions at this shallow lake, with notable events in 1956, 1959, and 1986. There likely have been many more winterkill events that have gone unreported.

### **Current Status**

A fish community survey was conducted in Roberts Lake May 12-14, 2014. The total effort consisted of 6 large mesh fyke-net lifts and 2 small mesh fyke-net lifts. The survey was done to: 1) capture baseline fisheries information at an impoundment where the dam is owned and maintained by MDNR Fisheries Division, and 2) to evaluate fish communities at a shallow, regionally representative lake following a harsh northern Michigan winter. This survey was prior to any spawning activity for panfish species due to a cold spring. Fisheries personnel observed many dead and decaying largemouth bass and bluegill in the shallows during the onset of the netting process, a testimonial to the harsh winter and low oxygen levels likely present in Roberts Lake in previous months. Water temperature ranged from 58-59 degrees Fahrenheit during the three day survey event, while air temperature was cool and conditions were wet.

A total of 92 fish were captured during the three day netting survey (Table 1). This is a low number when compared to catches across similar regional lakes. Seven species were collected, indicating low species diversity. Low total catch and species diversity, along with the dead largemouth bass and bluegill observed, suggest frequent winterkill events in Roberts Lake. This is further supported by the reduced number of age groups for species such as bass and bluegills, which are highly intolerant to low dissolved oxygen levels.

The most common species in the catch were bluegill and northern pike (Table 1). Bluegill were represented by two age groups with most individuals larger than 6 inches total length (tables 2 and 3). Few bluegills less than 5 inches were collected. When compared to the statewide average for this species, Roberts Lake bluegills grow moderately fast which is likely due to reduced competition as a result of frequent winterkills. A few pumpkinseed were also collected, and were also represented (like bluegills) by only two age groups (3 and 4-year old fish). Northern pike are the top predator present in Roberts Lake (Table 1) and their growth is considered average. Five year classes (ages 3-7) and a number of individuals greater than 24 inches were collected.

Some largemouth bass were also collected, but were few in number (Table 1). Similar to bluegill and pumpkinseed, only two age groups of this species were collected (Table 3). Yellow perch, darters, and bullheads were captured during the survey but in very low numbers.

### **Analysis and Discussion**

Winterkill is a significant source of natural mortality for fish in Roberts Lake given the low numbers, range of fish sizes, and ages observed in our 2014 survey catch. Growth rates appear relatively good

for game fish, which is common in winterkill lakes with reduced fish densities. Roberts Lake is able to support a fishery due to quick growth of fish that survive in its waters. Anecdotal reports from anglers and campers is that this lake does provide a moderate amount of fishing activity, primarily in the open water season.

The small outlet structure which regulates water levels of the flooding is inspected periodically, and DEQ recommendations have been implemented to maintain functionality. A recent improvement was made in the fall of 2014 and was done cooperatively between MDNR and local users of the flooding. A few new stop boards were constructed, and boards were installed so the board level was consistent across the entire spillway. Eye bolts, chains, and locks were also installed and will be maintained by MDNR and its public partners. In the past, boards were easily removed which lead to unacceptable water levels in the flooding.

### **Management Direction**

1. Continue to rely on public citizens when help is needed with the Roberts Lake spillway.
2. The spillway structure was considered to be in good shape in 2014 and this flooding will continue to provide recreational opportunities for both anglers and campers.
3. Gather more information on recreational use at Roberts Lake, including angling, so that a cost:benefit analysis of the impoundment can be completed. This may be able to be completed with trail cameras (to estimate use).

### **References**

Figure 1. General location of Roberts Lake in Cheboygan County.

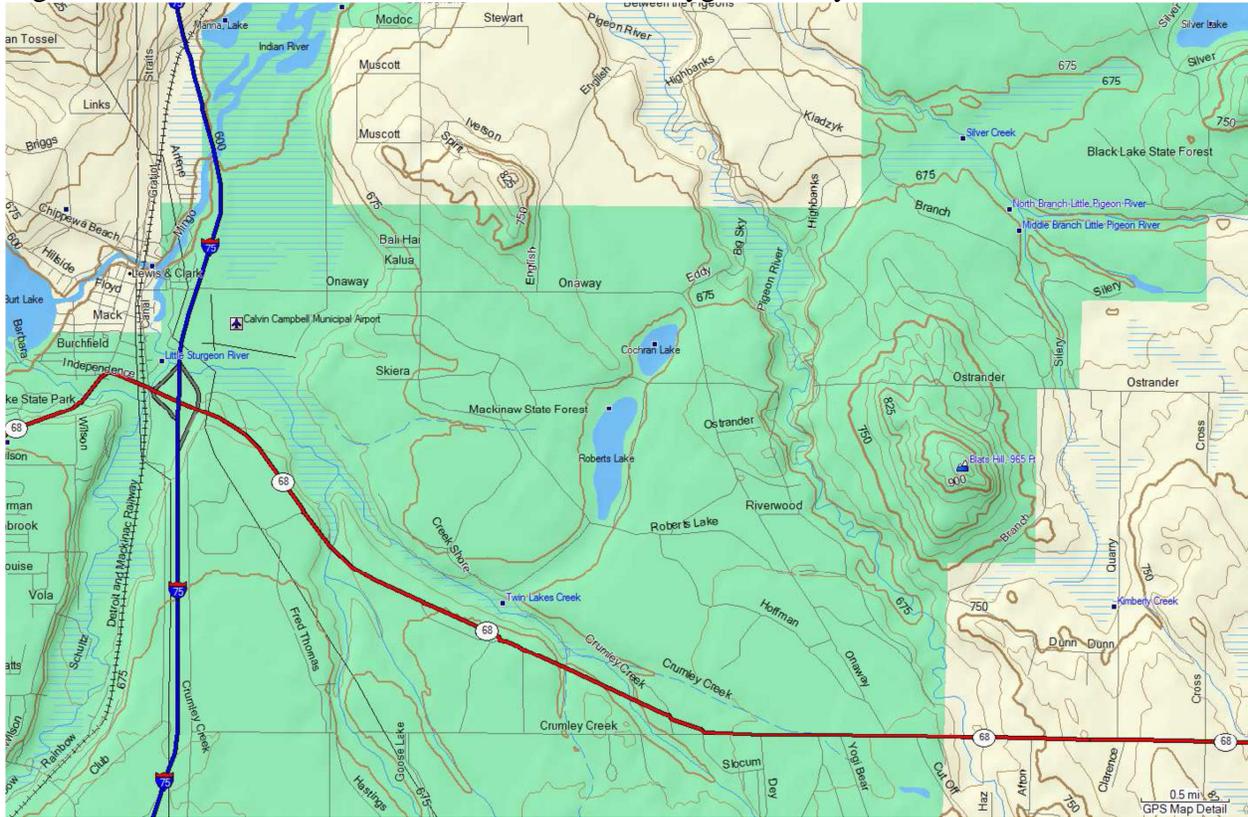


Figure 2. Depth map of Roberts Lake from 1945.

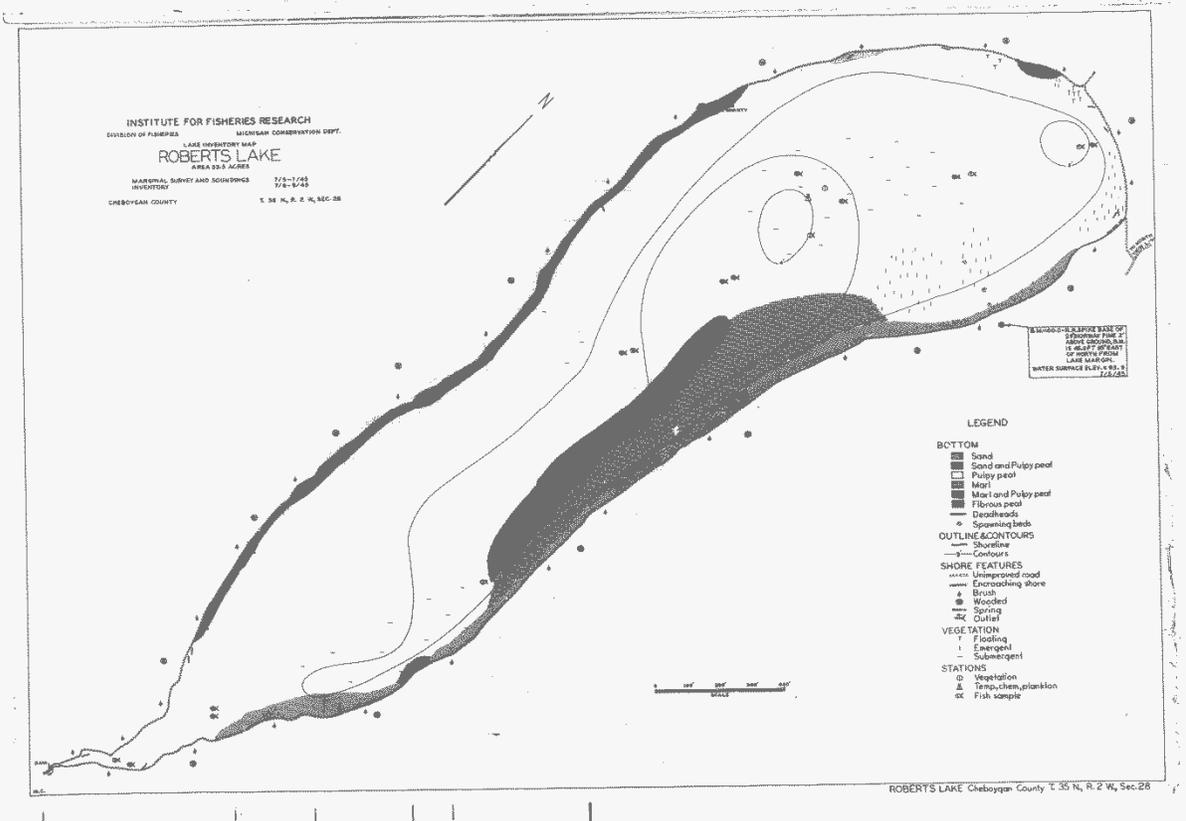


Table 1. Species and relative abundance of fishes collected with survey gear at Roberts Lake, May 12-14, 2014.

<b>Common Name</b>	<b>Number</b>	<b>Percent</b>	<b>Length Range (inches)</b>	<b>Weight (lbs)*</b>	<b>Percent</b>	<b>Growth** (inches)</b>
Bluegill	47	51.1	1-8	11.2	11.0	+1.4
Northern pike	20	21.7	19-32	80.5	79.3	+0.2
Iowa darter	10	10.9	2	0.1	0.0	
Pumpkinseed	6	6.5	5-8	2.3	2.2	
Largemouth bass	5	5.4	10-15	5.8	5.7	
Brown bullhead	3	3.3	3-12	1.5	1.4	
Yellow perch	1	1.1	8	0.3	0.3	
<b><i>Total</i></b>	<b>92</b>			<b>101.6</b>		

\*Calculated based on length-weight relationships

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

Table 2. Length-frequency distribution of certain game fishes collected during the mid-May 2014 survey at Roberts Lake.

<b>Length (in)</b>	<b>Bluegill</b>	<b>Pumpkinseed</b>	<b>Northern pike</b>	<b>Largemouth bass</b>
1	1			
2				
3				
4				
5	9	1		
6	13			
7	20	3		
8	4	2		
9				
10				2
11				1
12				
13				
14				
15				2
16				
17				
18				
19			2	
20				
21			1	
22			1	
23			1	
24			2	
25			2	
26			5	
27			2	
28				
29			2	
30			1	
31				
32			1	

Table 3. Weighted mean length and age composition of selected species in the Roberts Lake survey, May 12-14, 2014.

Species/Age	No. Aged	Length range (in.)	State avg. length (in.)	Weighted mean length (in.)	Weighted age freq.	Mean growth index
<b>Northern pike</b>						+0.2
Age III	2	19.0 – 19.8	20.8	19.4	14.08%	
Age IV	5	21.5 – 26.8	23.4	23.9	26.06%	
Age V	8	22.4 – 29.7	25.5	25.4	37.32%	
Age VI	4	26.2 – 30.2	27.3	28.9	15.49%	
Age VII	1	32.6	29.3	32.6	7.04%	
<b>Largemouth bass</b>						--
Age III	2	10.6 – 11.1	9.4	10.9	50.00%	
Age IV						
Age V						
Age VI	2	15.3 – 15.6	14.7	15.5	50.00%	
<b>Bluegill</b>						+1.4
Age III	25	5.5 – 8.2	5.0	6.2	58.31%	
Age IV	19	7.0 – 8.3	5.9	7.5	41.69%	
<b>Pumpkinseed</b>						--
Age III	4	5.3 – 8.4	4.9	6.9	77.27%	
Age IV	2	7.5 – 8.5	5.6	8.1	22.73%	
<b>Yellow perch</b>						--
Age IV	1	8.5	7.5	8.5	100.00%	

Photo 1. Roberts Lake, Cheboygan County.



Photo 2. Water Control Structure/spillway 2014 following board maintenance.



Photo 3. Northern Pike captured in the May 2014 fish community survey effort.

