

## **Big Tomahawk Lake**

Presque Isle County, T33N, R2E, Section 22, 23  
Black River watershed, last surveyed 2014

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### **Environment**

Big Tomahawk Lake is a 40-acre natural lake located approximately 10 miles southeast of the town of Onaway, Michigan in Presque Isle County. The lake has no obvious inlet or outlet but is within the Tomahawk Creek watershed, which is a tributary to the Black River.

Big Tomahawk Lake has a shallow west basin, and a relatively deeper east basin. The majority of the lake is less than 5 feet deep, though the east basin does drop down to just over 30 feet deep (Figure 1). The bottom substrate is primarily sand and marl, with pulpy peat in the deeper zones. Submergent and emergent aquatic vegetation is present throughout the lake littoral zone. Shoreline development is minimal, nearly the entire riparian zone is owned by the State of Michigan state forest system with the exception of one small private parcel and cottage located on the south shore. A small state forest campground with 25 camping sites exists along the north shore (see Photos). The lake-shoreline interface is predominantly wetland while the upland forest corridor consists of oak, aspen, and conifer trees.

A small unimproved public-access boat launch is located on the east shore. This access site has parking for approximately two trailers.

### **History**

Big Tomahawk Lake has been stocked or surveyed by the State of Michigan on a few occasions dating back to the 1930s. Stocking records show that adult and fingerling smallmouth bass were stocked in 1934, and from 1939-1941. Yellow perch fingerlings were stocked in 1939, and bluegill fingerlings were stocked in both 1936 and 1939. Warm water fish stocking in lakes was a common practice by management agencies during this era, regardless of whether stocking was warranted.

Michigan Department of Conservation (MDOC) personnel examined the lake conditions first in July of 1935. Spawning structures for both minnows and bass were placed around the lake to enhance spawning success of these species. Most structures were later deemed non-functional after they were relocated by lake users to areas less desirable. During this survey, bluntnose minnows were observed in "massive" schools in Big Tomahawk Lake. Largemouth bass were considered abundant based on observations and angler reports. Smallmouth bass were also known to inhabit the lake in lesser numbers, along with pumpkinseed sunfish, blacknose shiners, and central mudminnows. Yellow perch, bluegill, and smallmouth bass stocking was then prescribed following the 1935 survey.

More than four decades passed until the fish communities of Big Tomahawk Lake were again examined by the State of Michigan. This time, the survey work was completed by the Michigan Department of Natural Resources (MDNR) in mid-May of 1979. Secchi-disk, or water clarity, was measured at 19 feet. Fish sampling effort/gear consisted of 5 experimental gill net lifts, and 36 large

mesh trap net lifts. This was a considerable amount of sampling effort for such a small lake. It should also be noted that these two types of survey nets tend to catch larger fish due to the larger mesh sizes. Thus, small fish would likely be under-represented in the catch.

Following the 1979 survey, the lake was said to be in "excellent shape" by MDNR personnel based on survey catches. Largemouth bass were caught in high numbers, were considered fast growing based on age and growth data, and were represented by eight different year classes. Most bass were in the 11-16 inch size range. Another predator, northern pike, were captured in fair numbers and represented by four different year classes. Pike grew fast in Big Tomahawk Lake at the time, with most in the 23 inch size range, but some were found up to 29 inches. Eight year classes of bluegill were captured in the survey with most in the 6-9 inch size range. Gear selectivity may explain the lack of young bluegill captured in the survey. Bluegill growth was considered slow in Big Tomahawk Lake. Though not surveyed, many juvenile bluegill and bass were observed in the shallow water by MDNR personnel.

### **Current Status**

The most recent fish community survey of Big Tomahawk Lake was conducted from June 9-12, 2014. Effort consisted of: 2 experimental gill-net lifts, 3 large mesh trap-net lifts, 8 large mesh fyke-net lifts, and 2 small mesh fyke-net lifts. A total of 324 fish were captured during the survey (Table 1). The most abundant species in the catch were bluegill, followed by largemouth bass. Panfish such as bluegill, pumpkinseed, and rock bass made up 50% of the survey catch by number and 27% by weight. Largemouth bass and northern pike, the only predators, comprised 38% of the total catch by number, but 68% by weight.

Bluegills are currently the most abundant panfish in Big Tomahawk Lake, and a good proportion (70%) are 7 inches or larger (Table 2), which is considered a desirable size for tablefare. More than 7% of the bluegill collected were larger than 9 inches. Few small bluegill were collected. Growth of this species was slightly above average when compared to bluegill populations across Michigan (Table 1) and this species gets to acceptable harvest size relatively fast. Ten year classes of bluegill were captured (Table 3), which is a considerable number of year classes. Bluegill growth has not changed significantly when comparing the 1979 data to the 2014 bluegill growth information (Table 3).

Panfish diversity is relatively low in Big Tomahawk Lake, but sizes are generally desirable. Pumpkinseed sunfish were moderately abundant, with most larger than 6 inches. Pumpkinseed growth is considered fast in the lake. Rock bass were the only other type of panfish collected, and were relatively uncommon.

The predator population is restricted to largemouth bass and northern pike. Largemouth bass are the top predator in Big Tomahawk Lake, and make up most of the biomass for predators. Six year classes of largemouth bass were sampled, and growth of this species was considered average when compared to other Michigan waters. Legal size (14 inches and larger) largemouth bass were relatively uncommon, with bass in the 6-13 inch size range predominant. Despite the largemouth bass population being dominated by sub-legal fish, some large bass were present (Table 2).

Fewer northern pike were collected in the 2014 survey compared to the 1979 survey (Table 3). Some of this may be explained by the difference in sampling effort by year. However, it is likely that the northern pike population is lower today in Big Tomahawk Lake than compared to the late 1970s. Low

water levels (for spawning) in the recent decade may attribute to the lower numbers today. Four pike were collected in the 2014 survey and all were legal size (24 inches or larger), including one larger pike (Table 2).

Other species typical to a warm water northern Michigan natural lake were found in Big Tomahawk Lake, including blacknose and blackchin shiners, bluntnose minnows, black bullhead, and white suckers.

### **Analysis and Discussion**

Big Tomahawk Lake is a small natural lake in northeast Michigan with limited productivity. It has a shallow west basin, and a deeper east basin and a substrate dominated by marl. The lake has a largely undeveloped shoreline and limited aquatic vegetation growth.

The current fish community of the lake can be generally characterized as having: 1) a panfish community of low diversity but acceptable sizes, 2) a naturally-reproducing predator population consisting of average-growing largemouth bass, and northern pike, 3) a non-game fish community low in species diversity and abundance.

Despite diversity being low, the Big Tomahawk Lake panfish community is of fair quality, with relatively fast growth of bluegill and pumpkinseeds. The only predators of the lake are largemouth bass and northern pike. Largemouth bass of a variety of sizes and ages can be found, and are vital in helping balance the panfish community through predation. Based on survey results, this species should afford anglers an opportunity to catch good numbers of mid-size bass an occasional large fish. There appears to be average growth of bass in the lake, and a relatively low number of legal size bass which might be explained by angler harvest. Northern pike densities are not high, and their abundance is likely limited by water levels during spring spawning periods. The few pike that survive in the lake can grow to large sizes.

The non-game fish community of Big Tomahawk Lake is low in diversity and consists of shiners, minnows, bullheads, and white suckers.

### **Management Direction**

No change in fisheries management is recommended for Big Tomahawk Lake at this time. The current Michigan statewide standard fishing regulations are appropriate for this lake. Access for anglers is good through the state forest campground and the small public boat launch. This lake sits amid a group of natural lakes (Francis, Little Tomahawk, Shoepac, Loon) and floodings (Tomahawk Creek Flooding) in southwestern Presque Isle County. These waterbodies as a group are important to anglers not only for fishing, but for camping destinations as well. The Department of Natural Resources should maintain the public land surrounding Big Tomahawk Lake and protect the lakes wetland interface from any development.

### **References**

Figure 1. Big Tomahawk Lake

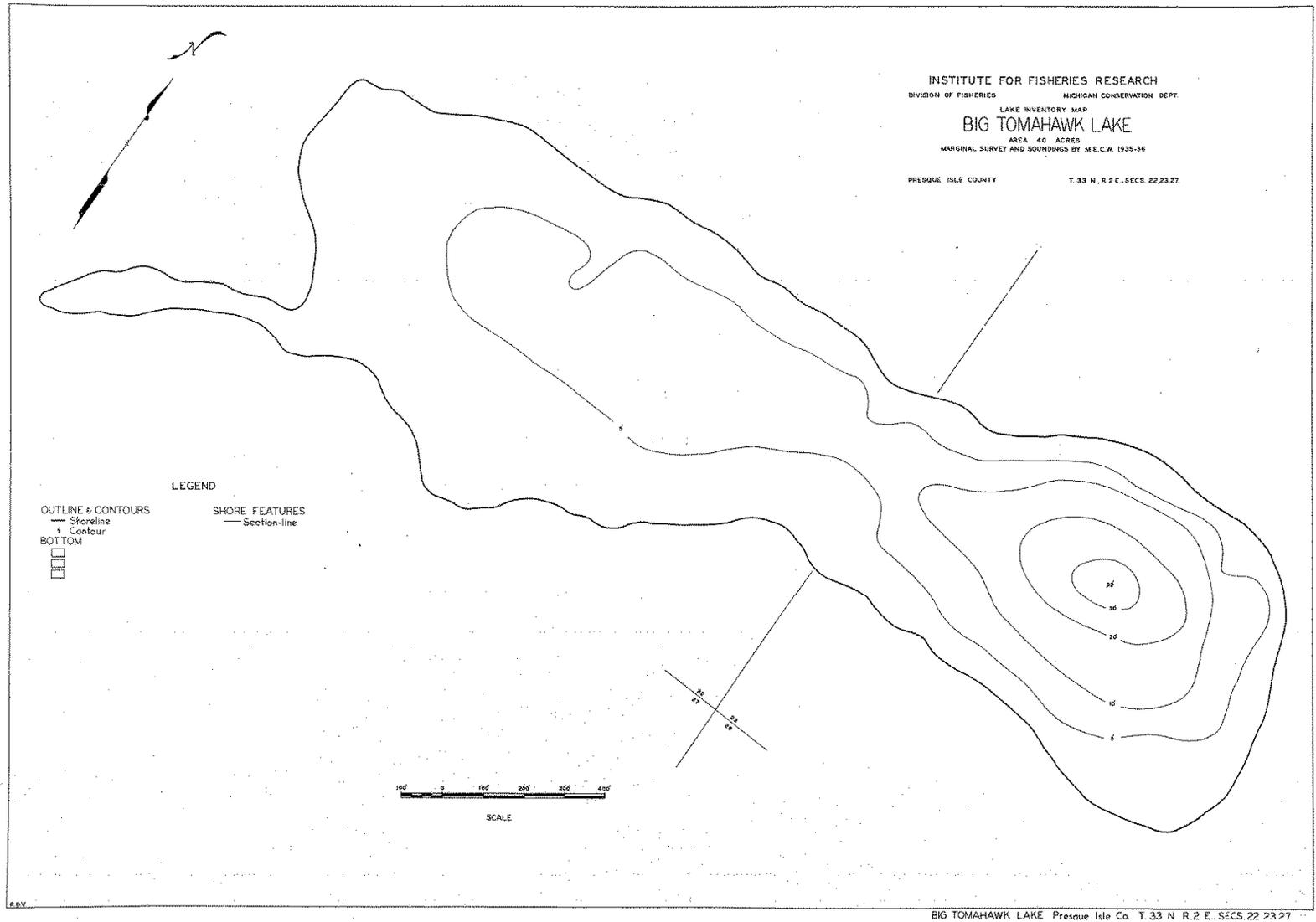


Photo 1. Big Tomahawk Lake boat launch site.



Photo 2. Big Tomahawk Lake State Forest Campground, north shore.



Photo 3. Big Tomahawk Lake shoreline.



Table 1.-Species and relative abundance of fishes collected with survey gear at Big Tomahawk Lake, June 9-12, 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	131	40.4	1-9	42.5	23.1	+0.6
Largemouth bass	118	36.4	7-19	95.5	51.9	0.0
Blacknose shiner	23	7.1	1-2	0.1	0.0	
Pumpkinseed	23	7.1	4-8	6.3	3.4	+1.4
Blackchin shiner	10	3.1	2	0.1	0.0	
Rock bass	8	2.5	4-7	1.1	0.6	
Black bullhead	4	1.2	7-14	4.5	2.5	
Northern pike	4	1.2	27-37	30.0	16.3	
Bluntnose minnow	2	0.6	2	0.0	0.0	
White sucker	1	0.3	21	3.9	2.1	
<b><i>TOTAL</i></b>	324			183.9		

\* 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 early June 2014 survey at Big Tomahawk Lake.

<b>Length (in)</b>	<b>Bluegill</b>	<b>Pumpkinseed</b>	<b>Northern Pike</b>	<b>Largemouth bass</b>
1	3			
2	1			
3	1			
4	1	1		
5	10	7		
6	23	6		
7	39	5		17
8	43	4		16
9	10			9
10				7
11				21
12				27
13				17
14				3
15				
16				
17				1
18				
19				2
20				
21				
22				
23				
24				
25				
26				
27			1	
28				
29			1	
30				
31			1	
32				
33				
34				
35				
36				
37			1	

Table 3.-Mean length (inches) at age for various game fishes of Big Tomahawk Lake. Number in parentheses represents number aged.

Species	Age group	May 1979	June 2014
Bluegill	I	2.7 (1)	2.0 (2)
	II	--	3.5 (1)
	III	4.5 (9)	5.6 (14)
	IV	6.3 (11)	7.1 (23)
	V	7.3 (7)	8.2 (1)
	VI	8.0 (11)	8.3 (1)
	VII	8.6 (4)	8.8 (8)
	VIII	9.1 (4)	8.9 (8)
	IX	9.3 (2)	9.0 (2)
	X	--	9.1 (1)
Largemouth bass	I	6.4 (1)	--
	II	9.5 (4)	7.8 (12)
	III	11.4 (22)	10.4 (35)
	IV	12.8 (14)	13.2 (12)
	V	14.4 (14)	13.6 (8)
	VI	15.9 (12)	17.8 (1)
	VII	17.2 (7)	--
	VIII	--	19.3 (1)
	IX	20.7 (1)	--
Northern pike	I	--	--
	II	20.9 (10)	--
	III	23.3 (26)	--
	IV	25.2 (7)	--
	V	28.0 (5)	--
	VI	--	27.5 (1)
	VII	--	31.1 (1)
	VIII	--	--
	IX	--	--
	X-XV	--	--
XVI	--	37.4 (1)	
Pumpkinseed	I	--	--
	II	--	--
	III	5.8 (1)	4.8 (1)
	IV	6.5 (5)	5.9 (11)
	V	7.2 (4)	6.9 (4)
	VI	7.9 (1)	8.2 (5)
	VII	8.1 (1)	8.8 (1)
	VIII	8.7 (1)	--