Twin Tomahawk Lakes
Montmorency County, T32N, R02E, Sections 13, 14
Black River watershed, last surveyed 2018

Tim A. Cwalinski, Senior Fisheries Biologist

Environment

Twin Tomahawk Lakes are a combined 36-acre pair of natural lakes located approximately 9 miles north of Atlanta, Michigan in Montmorency County (Figure 1). The pair of lakes, South and North Tomahawk lakes, are commonly referred to as Twin Tomahawk Lakes. They drain a small swamp from the south, while the outlet is the headwaters of Tomahawk Creek, which flows northerly into Tomahawk Creek Flooding and eventually into the Black River (Figure 2).

Both lakes have bowl shaped basins which drop off to a maximum depth of approximately 25 feet in the north lake, and 20 feet in the south lake (Figure 3). Both lake basins have a limited littoral zone with fair amounts of submerged and emergent aquatic vegetation. The bottom substrate is primarily sand and muck. Shoreline development is minimal as only one dwelling and dock can be found on the south lake. Nearly the entire riparian zone of the north lake is owned by the State of Michigan. There is a sizable channel that connects both lake basins. One large private parcel and residence is located on the northeast shore (see photos). Shoreline riparian zone consists of upland pine and oak forest, with considerable amount of bog and marsh. Recent alkalinity values of 144 milligrams per liter were measured for South Tomahawk Lake, while chlorophyll-a levels (10 micrograms per liter) were moderately high compared to other northern Michigan lakes. Water clarity, as measured by secchi-disk was 7 feet in the summer of 2018.

A small unimproved public-access boat launch is located on the east shore of north basin, and is only suitable for small boats, canoes, and kayaks; parking is very limited. The water surface elevation of both lakes may be influenced by the road which crosses over the outlet at the north side of North Tomahawk Lake.

History

Active fisheries management dates back only to 1966 at Twin Tomahawk Lakes. In that year, the Michigan Department of Conservation (MDOC) found a lake that stratified thermally in the summer and had low dissolved oxygen levels below the thermocline. Similar conditions have been found today in Twin Tomahawk Lakes (Table 1). Thus, very little cool or cold water habitat is available to fish during the summer months. Historically, the lake was considered to be very silty and produce very little fishing pressure. Daytime boat electrofishing on the lake with alternating current found Yellow Perch, Largemouth Bass, Pumpkinseed, Rock Bass, Black Bullhead, and Golden Shiners. From the brief survey, it was found to contain a poor fish community.

It was during this very period that the Tomahawk Creek Flooding and dam was being constructed downstream on Tomahawk Creek (the outlet from Twin Tomahawk Lakes). Fisheries managers at the time did not want to introduce some of the existing fish community from the upstream lakes into the new flooding. As a result, Twin Tomahawk Lake was chemically treated to reduce the unwanted fish

community in 1966. Records are generally lacking on the success of this reclamation, but do indicate that numerous "perch and bullheads" were noted dead. Following the reclamation, Twin Tomahawk Lakes were restocked in 1967 by MDOC with 13 adult Largemouth Bass and 250 adult Golden Shiners.

The next fish community survey of Twin Tomahawk Lakes was made by the Michigan Department of Natural Resources (MDNR) in early-June 1983. An unknown number of fyke- and trap-net lifts were used to accomplish this, and survey purpose was unknown. Over 1,100 fish were caught during the survey, and consisted of 8 species (Table 2). The panfish and predators were typical for a northern Michigan organic bottom natural lake. Length-frequencies of various game fish (Table 3) demonstrated an acceptable fishery was present in these two small natural lakes. Good numbers of panfish such as Bluegill and Pumpkinseed were collected and available to anglers, while good numbers of predators such as Largemouth Bass and Northern Pike were collected. No growth data was provided for the fish caught in the 1983 survey, so we are unable to make any comments on fish growth rates.

Current Status

The most recent fish community survey of Twin Tomahawk Lakes was conducted from May 21-24, 2018. South Tomahawk Lake was surveyed under the MDNR Status and Trends sampling protocol where sampling effort is related to lake size (Wehrly et al. 2015). We used more gear in this lake compared to the north basin to adhere to sampling protocol. We were unable to conduct nighttime electrofishing in either lake due to the limited size of the boat launch. Total sampling effort between the lakes consisted of: 8 experimental gill-net lifts, 2 large-mesh trap-net lifts, 18 large-mesh fyke-net lifts, and 8 small-mesh fyke-net lifts. A total of 617 fish were captured during the survey of both lakes (Table 4). The most abundant species in the catch were Bluegill, followed by Largemouth Bass. Panfish such as Bluegill, Pumpkinseed, Yellow Perch, and Rock Bass made up 75% of the survey catch by number and 56% by weight. Largemouth Bass and Northern Pike, the only large predators, comprised 12% of the total catch by number, but 36% by weight. Non-game species such as dace, darters, bullheads, shiners, and mudminnows were also collected, and are common to northern Michigan natural lakes.

Bluegills are currently the most abundant panfish in Twin Tomahawk Lakes, and a good proportion (64%) are 7 inches or larger (Table 5), which is considered a desirable size for tablefare. Fair numbers of small Bluegill were also collected. Growth of this species was average to slightly above average when compared to Bluegill growth across Michigan (Table 6), and well within an acceptable range. Twelve year classes of Bluegill were captured (Table 6), which is a considerable number of year classes. Thus, Bluegill can get to large sizes in Twin Tomahawk Lakes by living to older ages while possessing average to slightly above average growth rates.

Panfish diversity is average in Twin Tomahawk Lakes, and sizes are generally desirable. Pumpkinseed sunfish are considered abundant while Yellow Perch were considered present, but not abundant (Table 4). Pumpkinseed can attain sizes attractive to anglers and supplement the Bluegill catch. They also demonstrate above average growth rates and can live to relatively older ages (Table 6). Yellow Perch are not as abundant in Twin Tomahawk Lakes as demonstrated by the lower catches in previous surveys (tables 2 and 4). No larger perch were collected in the recent survey (Table 5).

The predator population is restricted to Largemouth Bass and Northern Pike in Twin Tomahawk Lakes. Largemouth Bass are the top predator and the population is dominated by sub-legal size fish (14 inches or less). Few legal size bass (15 inches and larger) were collected (Table 5). Largemouth Bass growth was considered average and fish up to age 12 were collected. Bass growth appears to slow down considerably after 13 inches in length is attained (Table 6).

Northern Pike were collected both in the 1983 and 2018 surveys (tables 2 and 4). Pike demonstrated a stunted size structure in 1983 and again in 2018 (tables 3 and 5) with most fish collected in the 17-19 inch size range. Recent growth rates of pike were considered extremely poor (Table 6).

The diversity of non-game fish collected in Twin Tomahawk Lakes was typical for a small and isolated natural lake, with bullheads, darters, dace, shiners, and Rock Bass present. Species such as White Sucker and Bowfin, often captured in other northern Michigan natural lakes, were not captured but still may be present.

Analysis and Discussion

Twin Tomahawk Lakes are two small natural lake basins connected by a short channel in northeast Michigan, characterized by moderate productivity. They have a limited, yet vegetated littoral zone, and each natural lake basin has relatively sharp dropoffs. It is likely that there is some fish winterkill during severe winters. The lakes have a largely undeveloped shoreline with the exception of one private residence. Based on summer temperature and dissolved oxygen measurements, the lakes stratify and dissolved oxygen is low in the colder, deeper layers. Thus, they provide very little cold water refuge for some species (Northern Pike, Yellow Perch), which may help explain their poor growth rates. It is considered to possess a more classic warm water fish community.

The current fish community of the lake can be generally characterized as having: 1) a panfish community of average diversity and acceptable sizes, 2) a naturally-reproducing predator population consisting primarily of Largemouth Bass that have average growth rates, and Northern Pike which are common but have a stunted size structure, 3) a non-game fish community low in species diversity and abundance.

Twin Tomahawk Lakes exhibit an acceptable panfish community and offer anglers the opportunity to catch Bluegill and Pumpkinseed primarily. Largemouth Bass of a variety of sizes and ages can be found and are vital in helping balance the panfish community through predation. The slow growth rates and general lesser abundance of larger bass may indicate that some harvest may be occurring. Based on survey results, this species should afford anglers an opportunity to catch good numbers of mid-size bass. Northern Pike are abundant due to ample spawning habitat. However, their growth rates are low, likely as a product of a lack of cool- or cold-water refuge in the summer, likely reducing their metabolism and feeding.

The non-game fish community of Twin Tomahawk Lake is average in diversity and dominated by darters, bullheads, mudminnows, and dace.

Management Direction

No major change in fisheries management is recommended for Twin Tomahawk Lakes at this time. The fish community currently in the lake is generally acceptable for such small natural forest lakes in northern Michigan. The current Michigan statewide standard fishing regulations are appropriate for all species, except for Northern Pike. Pike growth rates are extremely depressed, and this species rarely would attain legal size (24 inches or larger). It is recommended that MDNR remove the size limit on pike from this waterbody and open it up to possible harvest and thinning of smaller pike.

Access for anglers is fair to Twin Tomahawk Lake, both in the summer and winter. The relatively limited access to the lake complements the natural character of this small waterbody. The lake offers regional anglers another location to fish at all times of the year, thus spreading out fishing pressure in the area.

References

Wehrly, K. E., D. B. Hayes, and T. C. Wills. 2015. Status and trends of Michigan inland lake resources 2002-2007. Michigan Department of Natural Resources Fisheries Report 08. Institute for Fisheries Research, Ann Arbor.

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

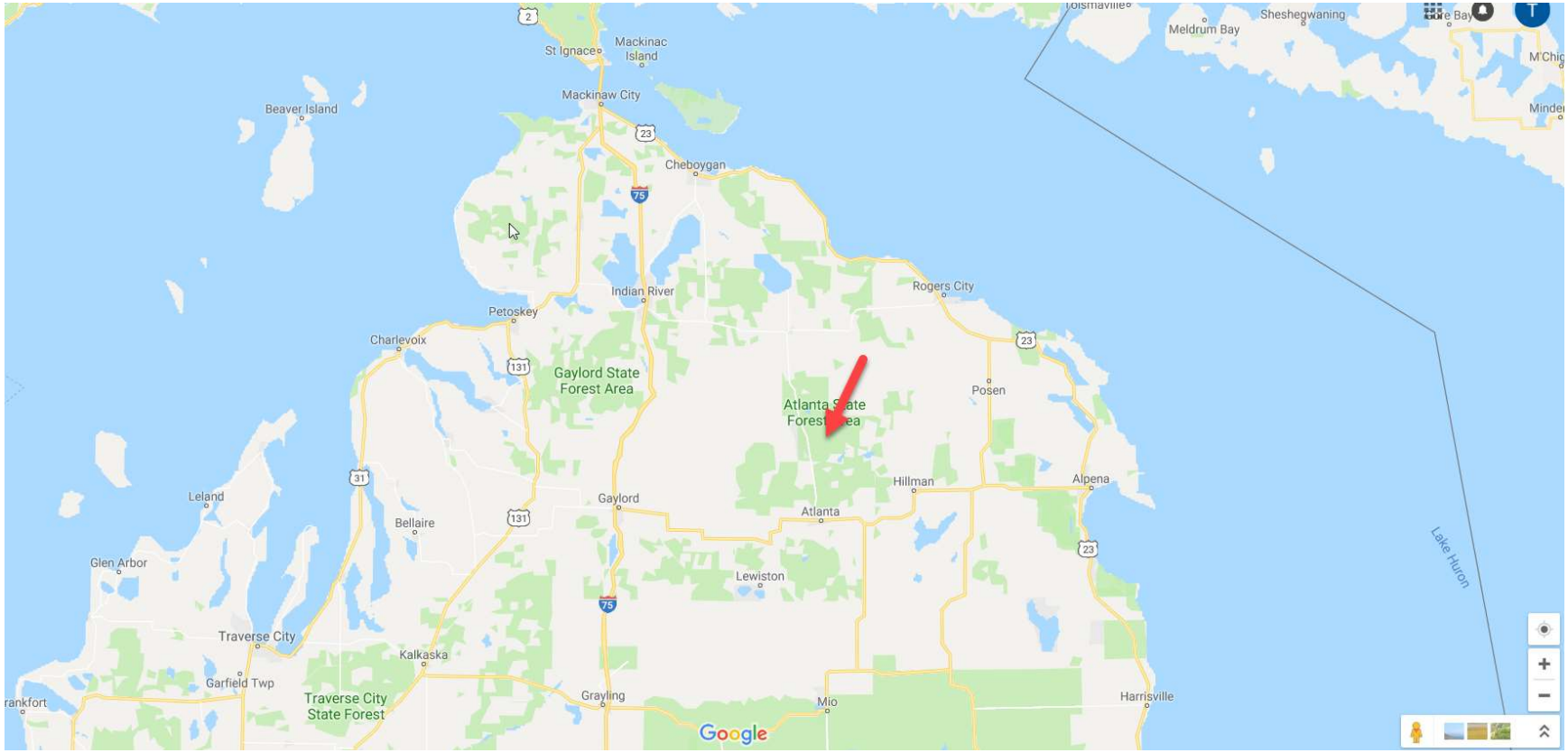

Figure 2. Twin Tomahawk Lakes and surrounding area. Red arrow indicates South and North Tomahawk lakes.

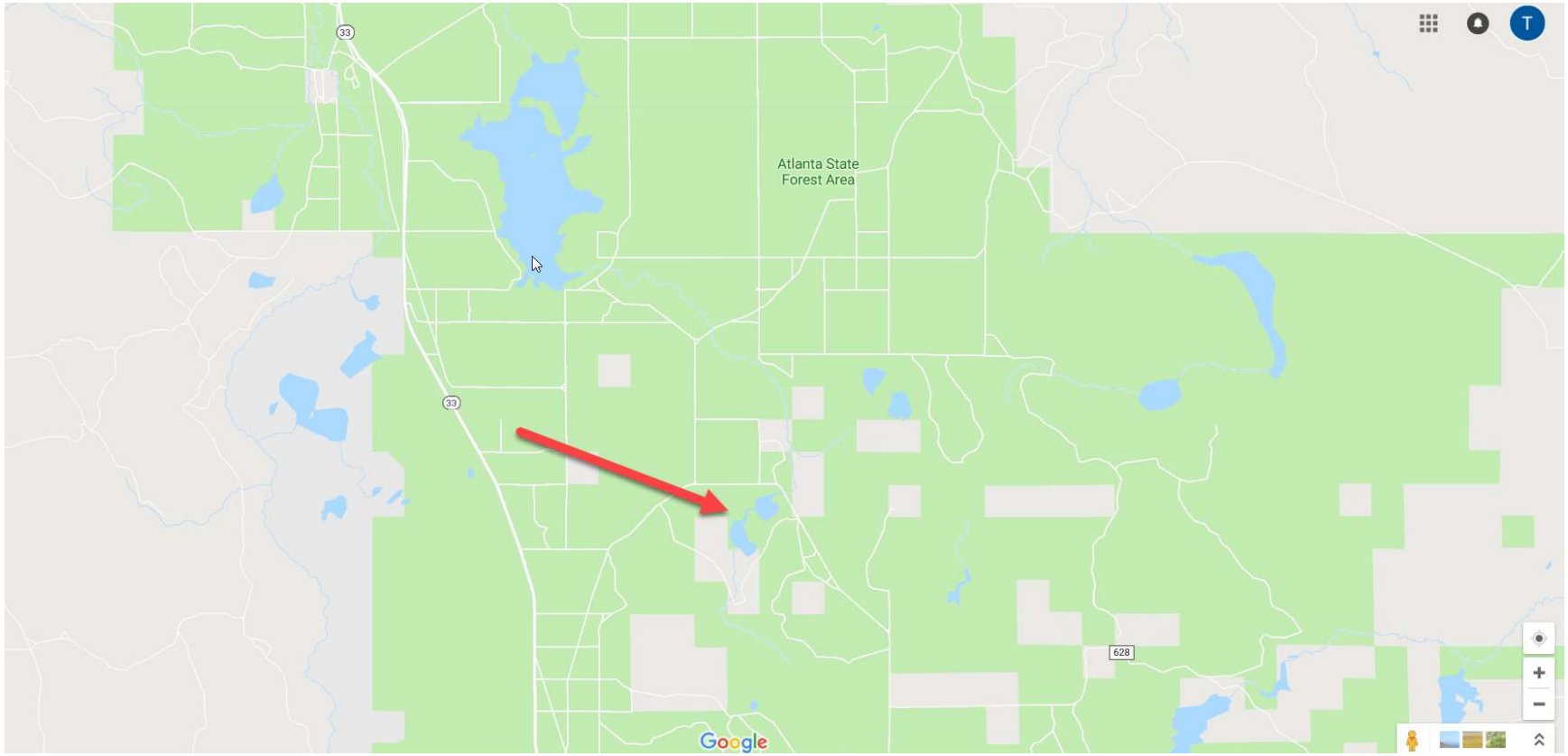

Figure 3. Original bathymetric map for Twin Tomahawk Lake.

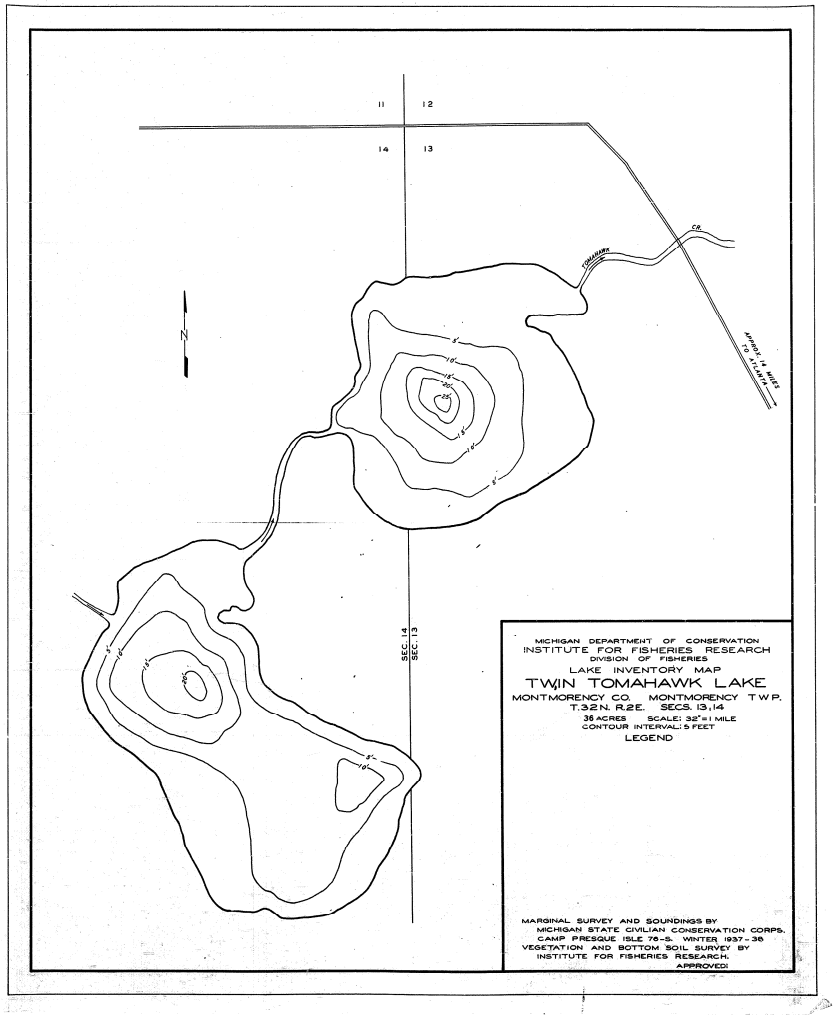

Table 1.-Water temperature and dissolved oxygen profile for South Tomahawk Lake, August 27, 2018.

Depth (ft)	Temperature (F)	Dissolved Oxygen (ppm)
1	74	8.3
2	74	8.3
3	72	8.0
4	71	7.7
5	70	7.6
6	69	7.4
7	68	6.8
8	65	4.7
9	64	4.1
10	62	3.4
11	59	1.5
12	55	0.0
13	50	0.0
14	49	0.0

Table 2.-Species and relative abundance of fishes collected with survey gear at Twin Tomahawk Lakes in northwest Montmorency County, early June 1983. Sampling effort unknown.

Common Name	Number	Length Range (inches)	Weight* (lbs)
Bluegill	345	3 - 10	68.3
Bullhead species	199	7 - 14	-
Rock Bass	152	3 - 10	36.5
Pumpkinseed	141	3 - 8	21.0
Largemouth Bass	116	7 - 19	144.2
Northern Pike	97	11 - 30	165.9
White Sucker	26	11 – 22	64.2
Yellow Perch	26	3 – 13	15.0
TOTAL	**1,102**		

* calculated, not actually measured

Table 3.-Length-frequency distribution of the catch from the Twin Tomahawk Lakes survey, early June 1983. Sampling effort unknown.

Length (in)	Bluegill	Pumpkinseed	Northern Pike	Largemouth Bass	Yellow Perch
1					
2					
3	10	9			1
4	16	40			3
5	83	46			2
6	171	37			
7	34	7		4	
8	23	2		5	
9	7			17	1
10	1			20	4
11			1	11	8
12				7	4
13			2	4	3
14			1	16	
15			5	14	
16			9	10	
17			19	3	
18			16	4	
19			18	1	
20			2		
21			2		
22			7		
23			6		
24			1		
25			3		
26			3		
27			1		
28					
29					
30			1		

Table 4.-Species and relative abundance of fishes collected with survey gear at Twin Tomahawk Lakes, May 21-24, 2018.

Common Name	Number	Percent by number	Length Range *(inches)*	Weight (lbs)*	Percent by weight	Mean growth index** (inches)
Bluegill	398	64.5	1 - 10	127.7	49.9	+0.6
Largemouth Bass	44	7.1	2 - 20	53.7	21.0	+0.1
Pumpkinseed	41	6.6	1 - 9	15.0	5.9	+0.9
Northern Pike	33	5.3	13 - 20	39.5	15.4	-4.0
Yellow Perch	24	3.9	1 - 5	0.2	0.1	-0.8
Iowa Darter	18	2.9	1 - 2	0.0	0.0	
Brown Bullhead	15	2.4	12 - 14	18.0	7.0	
Central Mudminnow	12	1.9	1 - 2	0.1	0.0	
Northern Redbelly Dace	12	1.9	1 - 2	0.1	0.0	
Johnny Darter	9	1.5	1 - 2	0.1	0.0	
Golden Shiner	6	1.0	2 - 5	0.1	0.0	
Rock Bass	3	0.5	7 - 9	1.6	0.6	
Blacknose Dace	2	0.3	2	0.0	0.0	
Total	617			256.1		

* calculated based on length-weight relationships

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

Table 5.-Length-frequency distribution of certain game fishes collected during the late-May 2018 survey at Twin Tomahawk Lakes.

Length (in)	Bluegill	Pumpkinseed	Northern Pike	Largemouth Bass	Yellow Perch
1	49	1			1
2	55	4		2	20
3	14			4	2
4	5				
5	4	1			1
6	16	6		1	
7	41	14			
8	132	13			
9	79	2		1	
10	3			5	
11				1	
12				3	
13			2	9	
14				8	
15			1	9	
16			5		
17			9		
18			11		
19			4		
20			1	1	
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Table 6.-Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from Twin Tomahawk Lakes May 2018. Number of fish aged is given in parenthesis. A minimum of five fish per age group is statistically necessary for calculating a Mean Growth Index, which is a comparison to the State of Michigan average.

	Age												
Species	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Mean Growth Index
Bluegill	2.3	3.6	5.2	6.5	7.7	8.0	8.8	9.4	9.2	9.5	9.7	10.3	+0.6”
Largemouth Bass	6.9	10.5	11.5	13.4	13.7	14.6	15.0	15.0	15.1	15.0	15.7	20.5	+0.1”
Northern Pike	13.0	15.4	17.6	18.5	18.9								-4.0”
Pumpkinseed	2.5	-	6.4	7.1	7.3	8.0	7.7	8.1	8.7				+0.9”