Michigan DNR

Threemile Lake, Van Buren County

Threemile Lake is located about 3 miles southwest of the city of Paw Paw. This lake has a history of water level fluctuations, so estimates of surface acreage vary. There is a large marsh along the western shoreline of the lake that was too shallow to navigate with a boat during the 2007 survey. If this marsh is excluded from the acreage calculation, the surface area of the lake is approximately 176 acres. The lake is irregularly shaped, with a shoreline development index of 2.72 (Orth 1983). The maximum depth of Threemile Lake is 35 ft. Drop-offs are steep at the north end, but most of the southern half of the lake is shallower than 15 ft. Sandy substrates are common along the northern shoreline, whereas organics predominate throughout the remainder of the lake. There are no outlets, and the only inlet is a small ditch that flows into the east side of the lake.

The soils within the Threemile Lake watershed fall within two major groups: the well-drained Coloma-Spinks-Oshtemo soils to the east and the moderately well-drained Oshtemo-Kalamazoo-Houghton soils to the west. Agriculture (row crops and orchards) is a major land use along the periphery of the Threemile Lake watershed. Wetlands line the western shore of the lake. Residential and vacation homes are common along the rest of the shoreline. The dwelling density for the lake was 17.0 dwellings/mile (10.6 dwellings/km).

The water quality sampling for Threemile Lake was performed by Michigan Department of Environmental Quality staff on August 15, 2006. Water quality samples taken from the epilimnion yielded a total nitrogen (ammonia + organic) concentration of 0.072 mg/L and a total phosphorus concentration of 0.013 mg/L. As the ratio of nitrogen to phosphorus was much greater than 10:1, it appears that phosphorus is the limiting nutrient in this system (Shaw et al. 2004). The chlorophyll a concentration was 5.5 µg/L, and the Secchi disk depth was 13 ft. These water quality parameters are indicative of a mesotrophic system (Carlson and Simpson 1996).

As observed during past surveys, bluegill was the most abundant species in the catch (N = 756) in 2007. Stunting of bluegills was a major problem in this lake during the 1960s and 1970s. During the last fisheries survey (conducted in 1979), only 6% of captured bluegills were of harvestable size. In 2005, 72% of the bluegills collected were of harvestable size. The size score based on the trap net catch was 4.3, which is considered satisfactory (Schneider 1990). The size score for the electrofishing catch was slightly lower (3.5 = acceptable). The mean growth index (MGI) was -0.2, indicating that growth is about average for a Michigan bluegill population.

Pumpkinseeds (N = 183) and black crappies (N = 103) also are common in Threemile Lake. The average size for pumpkinseeds increased from 4.0 inches in 1979 to 6.3 inches in 2007. Seventy-two percent of the pumpkinseeds collected were of harvestable size. Abundance of black crappie apparently has increased during the last 30 years, as few crappies were collected during previous surveys. Although large fish were rare, crappies in the 7 inch to 9 inch range were common. Relative abundance of yellow perch in this lake fluctuates, and it appears that perch (N = 34) were near the low end of the cycle in 2007. Ninety-one percent of the perch captured were of harvestable size. Growth was near state average for pumpkinseeds (MGI = 0), black crappies (MGI = -0.3), and yellow perch (MGI = +0.2).

Largemouth bass (N = 120) were the most abundant predators in the catch. As observed during previous surveys, only a small percentage of the bass were of legal size. Poor growth (MGI = -1.3) is responsible for the observed size structure. Nine year classes were represented in the catch. With average growth, largemouth bass reach 14 inches during their sixth summer of life (age 5). Thus, all fish age 6 or older would be expected to be of legal size. Fish in this age group composed 21% of the largemouth bass catch during the 2007 survey, indicating that annual survival of largemouth bass is within the typical range for Michigan populations.

Northern pike (N = 4) were collected for the first time during the 2007 survey. Because this lake is not connected to any other water body, these fish must have been introduced by anglers. Northern pike spawn in areas of flooded vegetation, so the large marsh along the western shore of Threemile Lake is potential pike spawning habitat. At this time, there is no evidence of northern pike reproduction in this system.

The fish community in Threemile Lake appears to be well-balanced. Panfish (bluegill, pumpkinseed, black crappie, yellow perch, and hybrid sunfish) composed 49% of the biomass in the catch, whereas piscivores (largemouth bass, northern pike, and bowfin) made up 35% of the biomass.

Four different turtle species were collected during this survey: musk, snapping, painted, and spiny softshell. The marsh along the western shoreline of Threemile Lake provides habitat for turtles and other reptile and amphibian species.

Management Recommendations: No changes in management are recommended at this time. The fish community is well-balanced, and the lake appears to be providing good fishing opportunities for bluegills, pumpkinseeds, and black crappies. The extensive marsh along the western shoreline provides valuable habitat for fish (especially juveniles), amphibians, and reptiles. This marsh should be protected from future development.

REFERENCES

Carlson, R. E., and J. Simpson. 1996. A coordinator's guide to volunteer lake monitoring methods. North American Lake Management Society, Madison, Wisconsin.

Orth, D. J. 1983. Aquatic habitat measurements. Pages 61-84 *in* L. A. Nielsen and D. L. Johnson, editors. Fisheries techniques. American Fisheries Society, Bethesda, Maryland.

Schneider, J. C. 1990. Classifying bluegill populations from lake survey data. Michigan Department of Natural Resources, Fisheries Technical Report 90-10, Ann Arbor.

Water: Threemile Lake
Discharge county: Van Buren
Survey begin: 05/14/2007 end: 05/17/2007
T/R/S: 03S 14W 21
Survey type: Inland Lake
Status: Waiting Approval
Primary purpose: Status & Trends

Inch group	BCR	BLG	LMB	NOP	PSF	YEP	Total
1		32					**32**
2		24			1		**25**
3		18	1		1		**20**
4		22	1		9		**32**
5	1	114			40		**155**
6	15	371	6		103	3	**498**
7	37	173	7		29	7	**253**
8	26	2	25			14	**67**
9	18		23			6	**47**
10	5		12			4	**21**
11			24				**24**
12	1		9				**10**
13			5				**5**
14			1				**1**
15			1				**1**
16			1				**1**
17			2				**2**
18			1				**1**
19			1				**1**
31				1			**1**
34				1			**1**
36				2			**2**
Total:	**103**	**756**	**120**	**4**	**183**	**34**	**1,200**

Weighted Mean Length and Age Composition

All Efforts

Produced: October 2, 2008

Water: Threemile Lake
Survey begin: 05/14/2007 end: 05/17/2007
Survey type: Inland Lake
Primary purpose: Status & Trends

Discharge county: Van Buren
T/R/S: 03S 14W 21
Status: Waiting Approval

Gear:

No. used	Gear	Common name
1	Boom Shocker	Boom Shocker (Mich)
1	Fyke Net JAC-04	JAC-04 LMF standard 6X4
1	Gill Net JAC-05	JAC-05 125 ft. experimental
1	Gill Net PLA-01	PLA-01 125 ft. experimental
1	Limnology	
1	Minnow Seine	Minnow Seine
1	Trap Net PLA-06	PLA-06 standard 6 by 3
1	Trap Net PLA-08	PLA-08 standard 6 by 3
1	Trap Net PLA-21	PLA-21 Standard 6 by 3

Species / Age	No. aged	Length range (in.)	State avg. length (in.)	Weighted mean len. (in.)	Weighted age freq.	Mean growth index*
Black crappie						-0.3
Age II:	2	5.9-6.2	6.0	6.08	2.43%	
Age III:	18	6.4-8.3	7.5	7.25	44.37%	
Age IV:	10	7.6-9.3	8.6	8.36	25.05%	
Age V:	12	8.8-10.1	9.4	9.11	22.52%	
Age VI:	1	10.4-10.4	10.2	10.40	0.97%	
Age VII:	3	9.9-12.2	10.8	10.58	3.69%	
Age VIII:	1	10.4-10.4	11.4	10.40	0.97%	
Bluegill						-0.2
Age I:	13	1.4-2.2	1.8	1.72	5.03%	
Age II:	13	2.1-4.1	3.8	2.97	3.44%	
Age III:	14	3.3-4.8	5.0	4.07	3.65%	
Age IV:	21	4.9-7.2	5.9	6.36	51.97%	
Age V:	10	6.3-7.4	6.7	6.80	33.36%	
Age VI:	3	7.5-8	7.3	7.55	2.55%	
Largemouth bass						-1.3
Age I:	2	3.7-4.3	4.2	4.00	1.67%	
Age II:	18	6.3-9.5	7.1	7.88	21.08%	
Age III:	11	8.4-9.5	9.4	8.96	22.08%	
Age IV:	8	9.7-11.2	11.6	10.35	13.19%	
Age V:	15	9.7-15.3	13.2	11.41	19.97%	
Age VI:	13	10.4-16	14.7	11.95	15.33%	
Age VII:	4	12.2-14	16.3	12.88	3.33%	
Age VIII:	1	18.9-18.9	17.4	18.90	0.83%	
Age IX:	3	17.8-19.3	18.3	18.33	2.50%	

* Mean growth index is the average deviation from the state average length at age.

Weighted Mean Length and Age Composition

All Efforts

Produced: October 2, 2008

Species / Age	No. aged	Length range (in.)	State avg. length (in.)	Weighted mean len. (in.)	Weighted age freq.	Mean growth index*
Northern pike						
Age III:	1	31.5-31.5	20.8	31.50	25.00%	
Age V:	2	34.9-36.5	25.5	35.70	50.00%	
Age X:	1	36-36		36.00	25.00%	
Pumpkinseed						--
Age II:	2	2.8-3.5	3.8	3.15	1.09%	
Age III:	6	4.1-5.8	4.9	5.00	6.28%	
Age IV:	5	4.7-5.7	5.6	5.48	9.56%	
Age V:	11	5.3-7	6.2	6.22	44.10%	
Age VI:	11	6.3-7.3	6.6	6.70	33.61%	
Age VII:	2	7.3-7.5	7.1	7.40	3.17%	
Age VIII:	1	5.7-5.7	7.5	5.70	2.19%	
Yellow Perch						+0.2
Age III:	5	6.3-7.6	6.5	7.08	14.71%	
Age IV:	7	6.4-8.9	7.5	7.82	24.12%	
Age V:	7	7.9-10.1	8.5	8.72	26.47%	
Age VI:	8	8.1-10.2	9.4	9.21	25.88%	
Age VII:	2	10.2-10.7	10.3	10.45	5.88%	
Age VIII:	1	9.4-9.4	11.1	9.40	2.94%	

* Mean growth index is the average deviation from the state average length at age.