

HUBBARD LAKE
Alcona County (T27N, R7E; T28N, R7E)
Surveyed May and September 1996

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Environment

Hubbard Lake, at 8,850 acres, is one of Michigan's largest natural lakes. It is located in northern Alcona County in the northern Lower Peninsula. The lake drains approximately 93,440 acres and has a flush rate of nearly four years. Maximum depth is near 90 feet with relatively little water acreage less than 15 feet deep. Hubbard Lake stratifies thermally and may be considered somewhat of a sterile lake. Five streams enter the lake including the West Branch River, and Sucker and Holcomb Creek. These streams add productivity to the lake in varying amounts by depositing organic sediment. Lake bottom substrates consist of sand, marl, and gravel in the shoals with marl and pulpy peat in the deeper water. A small 6 ½ foot high dam is located on the north shore which releases water into the Lower South Branch, Thunder Bay River. The original dam was constructed in the lumbering days to provide enough water to float logs out from the tributaries and across the lake proper. Three boat access sites are located on Hubbard Lake. Two State of Michigan public boat launches are located on Hubbard Lake. The MDNR recently revitalized both concrete ramps. One ramp is located in East Bay along the northeast shore while the other is located near the confluence of the West Branch River on the southeast shore. Each ramp has adequate parking for trailers. A township owned ramp is located in North Bay along the northwest shore and provides for 20 trailers. Zebra mussels were reported in Hubbard Lake for the first time in 1999. These organisms anchor to the stable bottom substrates in the lake which include cobble, gravel and even woody debris which is prevalent along the undisturbed west shore.

Fishery Resource

Fishery management practices have been inconsistent through the last century in Hubbard Lake. This is reflected in the amount and type of fish stockings that have occurred in this time frame. From 1937-1982, a wide array of fish were stocked at various sizes including: 115,444 yellow perch, 3,224,352 walleye fry, 432,900 lake trout, 31,200 shiners, 10,682 brown trout, and 106,000 rainbow trout. Warmwater fish species were the first to be stocked in these early years. An additional 17,181 small fingerling northern pike were stocked in three years including 1983, 1999, and 2001. Tiger muskellunge were planted in Hubbard Lake in 1980, 1982, and 1985 (a total of 57,070 fall fingerlings). Approximately 139,420 yellow perch were also stocked from 1987-2001. Good numbers of walleye have been stocked from 1980-1991 (Table 1).

Fish management practices at Hubbard Lake date back to the first half of the twentieth century when early fish surveys were conducted in the 1920s and 1930s. In 1942, more extensive fish sampling was conducted with seines, and fyke, and gill nets. This effort resulted in 24 species of fish collected in Hubbard Lake. An abundance of bait fish was noted along with good numbers of white suckers, yellow perch, rock bass, and smallmouth bass. Vegetation surveys were completed in August of the same year, which helped identify 24 species of aquatic plants in the lake. Oxygen levels suitable for fish were found down to approximately 43 feet at the time. The next fish collection was conducted in 1946. Already at that time anglers were referring to "the good old days" of Hubbard Lake fishing, and believed walleye and bass stockings should

commence. In 1947, commercial netting of rough fishes was initiated in effort to reduce numbers. Fish shelters have been installed in the lake in different years as a cooperative effort between local anglers and the state of Michigan.

During the 1960s, pike spawning marshes were constructed to enhance the predator base in the lake. A 1962 fish community survey listed only twelve species of fish. Lake whitefish spearing records also exist for this year. Netting surveys were also conducted in the late 1960's documenting good numbers of northern pike, rock bass, yellow perch, smallmouth bass, bullhead, and white sucker. Also observed were cisco and largemouth bass. Average size yellow perch were noted.

Yearling rainbow trout were stocked at a rate of 7 fish/acre in 1969. A winter gill netting survey the following year produced no trout catches. Trout were not stocked again in Hubbard Lake. Modern walleye stockings began in 1977 by the State of Michigan (Table 1). In 1979, the first walleye stocking evaluations were conducted to evaluate previously stocked walleye. No walleye were collected with the nighttime electrofishing gear, however, angler catches had been documented.

A general fish survey was completed in mid-May 1986. The purposes of the survey were to determine survival and growth of stocked walleye and tiger muskellunge, and to evaluate the yellow perch population. Effort consisted of 206 total lifts of fyke, trap, and gill nets. Fourteen species of fish were collected. Good numbers of walleye (403) were collected, representing age groups 2-8. Growth of this species was average compared to statewide walleye growth. Only one large tiger muskellunge was collected during the survey. Nearly 700 yellow perch were collected with good numbers of 11-14 inch fish present. Perch growth was superior to the statewide average length-at-age for this species. Also collected in impressive sizes and numbers during the survey were northern pike, smallmouth bass, and rock bass. A fish management prescription was then created for Hubbard Lake which recommended the discontinuation of muskellunge stockings while continuing stocking of walleye every three years.

Evaluation of walleye stocking efforts (Table 1) were carried out in 1989, 1990, and 1991. These evaluations utilized nighttime electrofishing each year, and included the use of experimental gill nets and fyke nets in 1989. Using the Serns Index (Serns 1982; Ziegler and Schneider 2000), it was estimated that the 1989 and 1991 stockings performed poorly (1 or less YOY walleye/acre). However, the 1990 collection included 83 YOY which resulted in an estimation of 4 YOY walleye/acre. This was still considered a poor year class of walleye, yet these fish were all from natural reproduction (Table 1). Older walleyes were collected each year (1989-1991) representing several age classes. Walleye growth was considered to be average compared to walleye growth across the State of Michigan in 1989. Angler reports in the same year were considered good.

An extensive fish survey was conducted on Hubbard Lake in mid-May 1996 to examine long term trends in the fish community. The survey was the first in a series of fish collections that would be conducted at the lake every ten years. Effort consisted of 111 fyke net lifts, 30 trap net lifts and 4 inland gill net lifts. Fyke and trap nets had a variety of mesh sizes and lead lengths. More than 4,000 fish were collected weighing over 7,000 pounds (Table 2). Good numbers of walleye were collected with the nets. Age-1 and age-4 walleye were collected indicating some level of natural reproduction in 1995 and 1992. Walleye had not been stocked in Hubbard Lake since 1991 (Table 1). Good numbers of age-6 and age-7 fish were represented in the survey catch (Tables 3 and 4). These fish averaged 18-19 inches in length and should be available to anglers. Walleye are however growing slightly slower at Hubbard Lake compared to the statewide average length-at-age for this species (Table 3).

Very few quality size yellow perch were observed in this survey with only 3% 10-inches and larger. Rock bass were abundant in Hubbard Lake with 80% of the fish captured 8-inches or larger. Good numbers of legal size northern pike are available to anglers as depicted by the catch by size distribution (Table 3). These fish grow well in Hubbard Lake. More than 100 smallmouth bass were collected during the survey with 48% 15-inches and larger.

Other notable catches included the wide array of bait fish that inhabit the lake including minnows, shiners, and dace. White suckers were the most abundant fish collected during the 1996 survey (Table 2). Large suckers are common with many fish ranging in length from 16-22 inches. Small white suckers are a good food source for predators and sucker abundance may help explain good growth of northern pike in Hubbard Lake (Diana 1987).

Another walleye evaluation was conducted in September of the same year (1996) to examine walleye natural reproduction. Sampling effort consisted of two hours of nighttime electrofishing along the south end of the lake. Ninety walleye were collected ranging in length from 3.2-14.8 inches and representing ages zero through four. Sixty-two YOY were collected at a rate of 32/hour. According to the Serns Index (Serns 1982), there were approximately 7 YOY walleye per surface acre in Hubbard Lake in the fall of 1996. This was considered a poor-average year class, yet all walleye (YOY and adults) collected during the fall survey were again produced naturally which is a rarity for walleye in most Michigan lakes. These fish represent years (1992 through 1996) when walleye were not planted into Hubbard Lake (Table 1). However, very few fish (1/90) were legal size. Walleye growth appears to have declined and it may take many years for these fish to recruit to legal size (≥ 15 -inches).

The walleye stocking program appears to be a success at Hubbard Lake. This species was planted in the lake during the late 1970s in efforts to provide another sport fishing opportunity for anglers. The spring and fall netting surveys in 1996 documented good numbers and size classes of walleye present. Although early walleye stockings (Table 1) met with limited success, some fish did survive. Walleye from these year classes should carry the fishery for a number of years and bolster young fish numbers through reproduction. Thus, it has been a case in which the MDNR "jump-started" walleye stocks, and now the fish maintain their own numbers with some level of variation in year class strength. Walleye growth, however, remains average to poor at Hubbard Lake.

Angling opportunities for other game fish abound at Hubbard Lake. Good numbers of northern pike, smallmouth bass, and rock bass provide angling. Species such as lake whitefish, brook and rainbow trout add to the fishery via incidental catches. Brook trout are native to some of the Hubbard Lake tributaries while rainbow trout may be offspring from past stockings. An important game fish at Hubbard Lake is the yellow perch. Many factors may lead to the variability of perch numbers over time at this lake including: a) the natural population variation of the species itself, b) increased predator levels (walleye, pike, bass), c) egg predation from abundant white suckers, d) angler harvest, and e) good perch growth. A combination of all these possible factors could lead to suppressed perch numbers in various years.

Management Direction

1. Although costly, an angler creel survey would provide additional information on vital catch statistics on Hubbard Lake and determine the importance of game fish such as yellow perch, walleye, and northern pike to the angling community.
2. Evaluate walleye growth, year class strength, and natural reproduction through fall electrofishing when possible. Effort should reflect the size of the lake. Sern's Index should be used for this evaluation. Thus, electrofishing distance and effort should be accurately measured. As prescribed (fish management prescription #101), the fall fingerling walleye stocking program will be retained at Hubbard Lake in case natural reproduction becomes inadequate or absent over a period of years.
3. Northern pike add diversity to the sport angling component at Hubbard Lake and growth of this species has been documented as favorable. As prescribed (fish management prescription #806), northern pike fry should be stocked in Hubbard Lake wetland areas to mimic natural reproduction and maximize survival. This would be done in years when fry are available and in

response to: a) loss of lease of private pike rearing areas, b) loss of wetland spawning/nursery areas as a result of riparian development, c) fluctuating water levels hindering pike development stages.

4. Another extensive fish netting survey should be conducted in order to examine long term trends in the Hubbard Lake fish population. Effort should mimic the 1996 survey. Species of special interest include yellow perch, walleye, northern pike, smallmouth bass and white suckers.

Serns, S.L. 1982. Relationship of walleye fingerling density and electrofishing catch per effort in northern Wisconsin lakes. *North American Journal of Fisheries Management* 2: 38-44.

Ziegler, William and J.C. Schneider. 2000. Guidelines for evaluating walleye and muskie recruitment. Chapter 23 *in* Schneider, James C. (ed.) 2000. *Manual of fisheries survey methods II: with periodic updates*. Michigan Department of Natural Resources, Fisheries Special Report 25, Ann Arbor.

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Diana, J. 1987. Simulation of mechanisms causing stunting in northern pike populations. *Transactions of the American Fisheries Society* 116: 612-617.

Table 1.—Walleye stocking history for Hubbard Lake, Alcona County.

Month	Year	Strain	Number	Number/Acre	Avg. length (in)
--	1977	--	55,556	6	--
--	1978	--	53,350	6	--
July	1980	--	642	--	--
August	1981	--	268,036	30	--
July	1982	--	7,008	1	--
June	1983	Macatawa	98,799	11	--
June	1984	Manistique	4,000	1	1.5
June	1985	Muskegon	76,920	9	1.0
June	1986	Muskegon	258,995	29	1.9
June	1989	Muskegon	200,714	23	1.8
June	1991	Muskegon	96,209	11	1.5

Table 2.—Species and relative abundance of fishes collected with survey gear at Hubbard Lake, May 13-20, 1996.

Common name	Number	Percent	Length range (in)	Weight	Percent	Growth*
White sucker	1,974	48	4-24	6,204.0	87	--
Emerald shiner	1,333	32	2-6	8.5	0	--
Rock bass	213	5	1-13	164.2	2	Above average
Walleye	122	3	5-23	209.9	3	Below average
Yellow perch	119	3	2-15	7.8	0	Average
Spottail shiner	115	3	2-5	1.8	0	--
Smallmouth bass	104	3	2-20	198.9	3	Average
Northern pike	52	1	12-44	226.2	3	Above average
Brown bullhead	28	1	8-15	33.6	0	--
Sculpins	10	0	2-4	0.1	0	--
Sand shiner	7	0	2-4	0.1	0	--
Rainbow trout	6	0	12-25	10.8	0	--
Brook trout	6	0	3-13	1.1	0	--
Fathead minnow	6	0	2-3	0.0	0	--
Common shiner	5	0	3-5	0.2	0	--
Carp	4	0	26-29	43.4	1	--
Lake whitefish	4	0	17-20	10.5	0	--
Yellow bullhead	4	0	11-16	5.3	0	--
Logperch	3	0	3-5	0.1	0	--
Creek chub	2	0	5-6	0.1	0	--
Gars	1	0	27	1.7	0	--
Northern redbelly dace	1	0	3	0.0	0	--
Golden shiner	1	0	3	0.0	0	--
Total	4,120			7,128.3		

* growth is compared to statewide average for that species

Table 3.—Average total weighted length (inches) at age, and growth relative to the state average, for fish sampled from Hubbard Lake with trap nets, fyke nets and gill nets, May 13-20, 1996. Number of fish aged is given in parentheses.

Species index ¹	Age											Mean growth
	1	2	3	4	5	6	7	8	9	10	11	
Yellow perch	3.9 (23)	6.4 (9)	7.5 (7)	8.8 (3)	---	13.9 (2)	---	---	---	---	---	+0.9
Walleye	5.7 (10)	---	---	15.0 (2)	16.2 (17)	18.1 (35)	18.8 (21)	20.2 (4)	22.5 (2)	22.5 (2)	22.1 (2)	-1.5
Northern pike	12.6 (1)	19.0 (6)	21.9 (9)	24.9 (18)	25.2 (8)	34.0 (5)	35.5 (2)	---	36.1 (1)	36.1 (1)	---	+2.1
Smallmouth bass	3.7 (6)	8.7 (4)	12.4 (14)	14.0 (7)	15.3 (19)	16.2 (16)	16.6 (7)	18.3 (1)	---	---	19.9 (1)	+0.8
Rock bass	2.0 (2)	3.5 (7)	5.9 (24)	7.8 (15)	9.1 (30)	10.0 (8)	10.6 (9)	11.4 (9)	12.0 (5)	12.0 (5)	12.7 (1)	+1.6

¹ Mean growth index is the average deviation from the state average length at age.

Table 4.—Estimated age frequency (percent) of fish caught from Hubbard Lake with trap nets, gill nets, and fyke nets, May 13-20, 1996.

Species	Age									
	1	2	3	4	5	6	7	8	9	10+
Northern pike	2	12	17	35	15	10	4	---	4	2
Yellow perch	52	20	16	7	---	5	---	---	---	---
Smallmouth bass	8	5	19	9	25	21	9	1	---	1
Walleye	11	---	---	2	18	38	23	4	---	4
Rock bass	2	6	21	13	26	7	8	8	4	6