Michigan Department of Natural Resources
Status of the Fishery Resource Report
No. 2004-6, Year 2004

Alcona Dam Pond

Alcona County (T25N, R5E, Sections various)
Surveyed June 6-12 and September 16, 2003

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Environment

Alcona Dam Pond, established in 1924, is a 975-acre impounded reach of the Au Sable River about three miles west of the town of Glennie, Michigan in Alcona County. The majority of the land surrounding the pond is under private ownership with a large parcel owned by the county. This county maintains a camping park on both the east and west side of the pond. The terrain around the lake is characterized as hilly with a mix of hardwoods and conifers. Surface geology of the surrounding area is predominantly Lacustrine sand and gravel and medium-textured end moraine. The discharge of the cool waters of the Au Sable River directly above the pond is approximately 1,000 cfs while actual width is 155 feet (Zorn and Sendek 2001). Below the Alcona Dam, discharge is 1,535 cfs and width is 168 feet (Zorn and Sendek 2001). The dam itself was constructed in 1924, has a current head of 39 feet and can hold in storage 5,000 acre-feet of water. Pond retention time is relatively short, at 1.6 days based on mean annual flow. The hydroelectric dam is operated by Consumers Energy and is regulated by the Federal Energy Regulatory Commission. A settlement agreement in 1994 has mandated specific operating procedures for 40 years. Two designated Michigan trout streams enter the pond: Bamfield Creek and Wilbur Creek. The river channel defines the nature of the pond. Extensive productive and unproductive littoral zones exist in many reaches of the impoundment. In other areas, the river channel runs 20-25 feet deep and lies close in proximity to the shoreline, leaving very little productive near-shore habitat. Bottom type consists mainly of sand, organic muck (particularly in the coves), and some gravel. Stumps and woody debris which once defined the flood plain now offer limited in-pond fish cover and invertebrate/periphyton anchoring. Three gravel-surfaced boat ramps are provided on the pond, and all three are maintained by the county. These three launches provide for approximately 20 trailer parking locations.

Fish Management Background

Upon creation of Alcona Dam Pond, early recommendations by fish managers centered on walleye stockings. Brown and rainbow trout were known to inhabit this reach of river, along with various sucker species, northern pike, rock bass, yellow perch, and an abundance of minnow species. Whitefish even migrated into this reach of river in the late summer. Early stockings of walleye were made from 1937 through 1940 (Table 1).

The first limnological profiles on Alcona Dam Pond were made in mid-August 1950. Suitable dissolved oxygen for most game fish (≥ 6ppm) was found throughout the water column while water temperatures were conducive to cool and warm water species such as northern pike, smallmouth bass, and panfish. A trap netting survey was conducted by the Michigan Department of Conservation (MDOC) in 1962. Predators such as northern pike, walleye, and smallmouth bass were prevalent along with nongame fish such as carp, bowfin, and white and redhorse suckers. Panfish such as rock bass and yellow perch were also well represented, and perch growth was good. A follow-up fish community survey was made in 1972 by MDOC with a variety of gear types used. Three-hundred

eighty-four fish were collected, with 14 species represented. Important game fish such as northern pike, smallmouth bass, and walleye comprised 12% of the catch by number. All fish were from natural reproduction (including walleye) since no stockings of these species had recently occurred. Walleye were considered abundant and represented by many sizes. Northern pike tended to be large, while smallmouth bass were small. Rock bass ranging from 6-8 inches and yellow perch 4-10 inches were common. White suckers were abundant. Angling reports at the time indicated fishing for large game fish was acceptable.

By the mid 1980's, angling pressure was noted as high at Alcona Dam Pond and corresponded with the perception that fishing quality had declined. In an effort to increase angler satisfaction and supplement natural reproduction, fish managers prescribed walleye stocking in the impoundment. Prior to the stockings, a fish community survey was conducted by the Michigan Department of Natural Resources (MDNR) Fisheries Division in July 1987. Sampling effort consisted of experimental gill net and fyke net lifts. Sampling efficiency with fyke nets was noted as marginal due to the steep nature of the shoreline. Predator fish such as walleye, northern pike, and smallmouth bass were captured in low numbers, but included some very large individual fish. The biomass of the catch was dominated by white and redhorse suckers, and bowfin. The yellow perch population was noted as abundant with good size structure.

Small fingerling walleye stockings began in 1988 at Alcona Dam Pond in effort to bolster predator numbers and to take advantage of the large rough fish population. A limnological profile was made of its waters in June 1991 which documented some thermal stratification (despite the river influence) and lack of dissolved oxygen at a depth of 36 feet.

A more intensive and cooperative fish community survey was made in May 1995 between the MDNR and U.S. Forest Service (USFS). Sampling effort consisted of experimental gill nets and fyke nets of varying mesh sizes. Again, predators such as walleye, northern pike, and smallmouth bass were collected in good to fair numbers. Walleye growth was average, with fish represented by ages 4-5, 8-9, and 11. Forty-percent (4/10) of the walleye were from the 1990 stocking year class while the remaining fish were produced naturally within the system. Eighty percent (8/10) of the captured walleye were legal harvest size (≥ 15 inches). Northern pike ranged in length from 11-39 inches and were represented by ages 1-2, 5, 7, and 9. Seventeen percent (3/18) of the collected pike were legal harvest size (≥ 24 inches). Pike are known to spawn during periods of high spring water, when peripheral wetlands are inundated. The lack of pike from certain year classes may indicate their spawning success variability between years. Large numbers of smallmouth bass in the 11-14 inch size range were collected. Growth of this species was considered poor at Alcona Dam Pond, while 33% (22/66) were legal size (≥ 14 inches). Smallmouth bass were represented by seven year classes (2, 4-8) indicating somewhat consistent natural reproduction. Large yellow perch and black crappie were also represented in the survey catch. Growth of these species was average to excellent, respectively. The population of bluegill and rock bass were noted as good, with some large specimens available. White suckers (14-20 inches) and bowfin (19-27 inches) were still very prevalent in Alcona Pond, whereas only one redhorse sucker was collected. This latter species regularly migrates upstream in the river, which may account for low survey catches in the pond.

A fall walleye evaluation was done by the MDNR in September 1995 (1.3 miles of shoreline) and another effort was conducted by the USFS in October of the same year. Both efforts consisted of electrofishing the pond's shoreline at night. Walleye ranging in length from 4-19 inches were collected during both efforts, with ages 0-5 represented. The September age-0 walleye (YOY) catch rate was 111/hour. Based on Serns Index, this translates to 30 YOY walleye/acre which indicates a strong year class. Thus, natural reproduction of the 1995 year class was excellent in the pond or upstream in the Au Sable River since no walleye were stocked in these waters in that year (Table 1).

Angler catch data were collected for Alcona Dam Pond in 1999 and 2000 in effort to determine pressure and catch. This effort was contracted to Huron Pines RC&D in cooperation with MDNR Fisheries Division. Funds for the survey were from the Consumers Power settlement fund. The results of the survey are found in Table 2-5 (MDNR Fisheries Division Gaylord, unpublished data) which show estimates for both harvest and catch and release. Pressure was estimated at 32

angler hours/acre in 1999 and 36 hours/acre in 2000 (late April through September) which was less than nearby Mio Impoundment in the same years (51 and 50 hours/acre, respectively). Approximately 90% of the total fishing pressure in both years was from boat anglers. The harvest rate of walleye was 0.2 fish/acre in 1999 and 0.3 fish/acre in 2000. These are low harvest rates. Harvest of northern pike was 0.2 and 0.4 fish/acre; respectively, and more moderate for smallmouth bass (0.8 fish/acre in both years). Catch and release of fish in 1999 (27,802) and 2000 (22,720) at Alcona Dam Pond was considerable (Table 3 and 5). This activity was significant for smallmouth bass.

Recent Fish Management

The most recent fish management surveys at Alcona Dam Pond were conducted in 2003 by MDNR personnel. A general fish community survey was made from June 9-12 with effort consisting of 18 large mesh trap net lifts, 15 large mesh fyke net lifts, 3 small mesh fyke net lifts, 1 mini-fyke net lift, and 10 experimental gill net lifts. Netting designs followed the Status and Trends sampling protocol where sampling effort is a standard product of lake size. Surface water temperature throughout the survey ranged from 62-63°F. Water temperature ranged from 62ºF at the surface to 54°F at the bottom, indicating little stratification. Secchi-disk reading was 11 feet. Zebra mussels were known to inhabit the pond at this time. A follow-up walleye evaluation was made in mid-September. This survey was accomplished with a pulsed direct current boomshocking boat which covered more than 2 miles of shoreline in less than 2 hours.

The total June fish catch was 1,158 fish (Table 6) with a total weight of more than 1,000 pounds. Important game fish such as northern pike, walleye, and smallmouth bass comprised 7% of the catch by number. This may be skewed low due to the large catch of forage in the mini-mesh fyke nets. These three predators, however, comprised 21% of the catch by weight. Panfish such as rock bass, yellow perch, bluegill, and pumpkinseed were well represented in the survey totals.

Walleye ranging in length from 14-27 inches were collected, with 82% (9/11) legal harvest size (≥ 15-inches). Eight year classes of this species were represented in the catch and ranged from age 0-11. Based on stocking history (Table 1), these fish are most likely from natural reproduction. Nearly 25% of the northern pike in the survey catch were legal size (≥ 24 inches) (Table 7). Ages of pike ranged from 1-9, with some large fish available. This species is abundant in Alcona Pond, and growth is considered average. Smallmouth bass are common in Alcona Pond, yet growth of this species is below the statewide average. Smallmouth bass were represented by age 4-11 specimens with a good percentage of legal size (≥ 14 inches) (Table 7). Older bass were dominated by the 1998 year class.

Panfish are readily available to anglers in Alcona Dam Pond and include bluegill, rock bass, yellow perch, pumpkinseed, and black crappie. Bluegill up to 8-inches were collected during the survey, and growth of this species is slightly below the statewide average. Bluegill are dependent on zooplankton and invertebrates for growth. These forage types may be limited in Alcona Dam Pond due to its riverine nature and low retention time. Black crappie and rock bass are also common in this impoundment (Table 6 and 7), while growth is average, many year classes are present. Yellow perch grow well in Alcona Dam Pond and reach lengths up to 13 inches (Table 7).

Only four walleye were collected during the fall boomshocking survey. This included two adult

fish and two age-0 (YOY) fish. These are very low numbers of young walleye, especially when compared to the 1995 fall survey which documented excellent walleye recruitment.

Overall, the fish community of Alcona Pond appears relatively stable. Game fish populations are currently in good shape and offer a diversity of angling opportunity. Important panfish species such as bluegill, rock bass, yellow perch, and black crappie are found in abundance in the pond and typically grow well. Large game fish such as northern pike and smallmouth bass are prevalent, with large fish of each species available to the angling component, particularly northern pike. Walleye are also stocked on occasion in Alcona Pond. This popular species adds another angling component to the fishery. Walleye natural reproduction occurs at varying levels in the pond and upstream Au Sable River reaches, yet this species should be supplemented by MDNR stocking efforts in certain years. Along with important game fish, other species found in abundance in Alcona Dam Pond include bowfin, white sucker, sand shiner, brown bullhead, bluntnose minnow, greater redhorse, and golden shiner.

Management Direction

1. The fish community of Alcona Dam Pond is healthy. Good numbers of predators can be found along with a diverse panfish community. Most fish are sustained through natural reproduction. Growth of walleye appears good, yet the abundance of this popular species is limited by its ability to produce occasional large year classes. Spawning occurs in the river upstream of Alcona Dam Pond, yet the size of the spawning run may be small each year. As a result, walleye will again be stocked in alternate years from 2004 through 2008. This should boost current low level populations and increase spawning stock in the future, especially after a year (2003) when walleye natural reproduction may have been low.

2. This Au Sable River system once provided critical spawning habitat for lake sturgeon prior to fragmentation created by the construction of hydroelectric dams. Investigations should take place to determine the potential for re-introduction of lake sturgeon into the river system near Alcona Dam Pond either through stocking or fish passage.

3. A decline in the amount of large woody debris is being noted in the littoral areas due to the lack of debris recruitment from upstream and near-shore areas due to the interruption of down stream movement and the young age structure of riparian trees. Investigations should take place to determine the potential for additions of large woody debris to improve littoral habitat.

References

Zorn, T.G., and S.P. Sendek. 2001. Au Sable River Assessment. Michigan Department of Natural Resources, Fisheries Division, Special Report 26, Ann Arbor, Michigan.

Table 1.-Stocking history for Alcona Pond, Alcona County.

Year	Species/*Strain*	Number	Number/Acre	Avg Length
1937	Walleye	800,000	821	Fry
1938	Walleye	1,320,000	1,354	Fry
1940	Walleye	1,000,000	1,026	Fry
1988	Walleye	30,034	31	1.7”
1990	Walleye/*Muskegon*	31,058	32	2.3”
2001	Walleye	59,503	61	1.8”
2003	Walleye/*Tittabawassee*	44,000	45	3.6”

Table 2.-Total angler harvest, fishing pressure and catch per hour, Au Sable River site 254 (Alcona Dam Pond) in 1999. Two standard errors are given in parenthesis.

Species	Catch/Hour	Apr24-May	June	July	August	September	Season
Walleye	0.0051	0	0	109	48	0	157
	(0.0056)	(0)	(0)	(143)	(96)	(0)	(172)
Northern pike	0.0056	0	33	77	48	15	173
	(0.0040)	(0)	(68)	(93)	(32)	(30)	(123)
Rock bass	0.0198	0	95	45	468	0	608
	(0.0264)	(0)	(135)	(68)	(795)	(0)	(809)
Yellow perch	0.0280	0	31	347	0	481	859
	(0.0244)	(0)	(64)	(451)	(0)	(586)	(742)
Smallmouth Bass	0.0241	0	33	425	217	64	739
	(0.0179)	(0)	(69)	(341)	(397)	(122)	(542)
Rainbow trout	0.0072	0	159	62	0	0	221
	(0.0095)	(0)	(276)	(91)	(0)	(0)	(291)
Bluegill	0.1509	0	560	1,750	1,093	1,227	4,630
	(0.0689)	(0)	(600)	(887)	(1,311)	(1,145)	(2,044)
Sunfish sp.	0.0020	0	0	0	0	60	60
	(0.0042)	(0)	(0)	(0)	(0)	(127)	(127)
White sucker	0.0020	0	0	0	0	60	60
	(0.0042)	(0)	(0)	(0)	(0)	(127)	(127)
Redhorse sp.	0.0020	0	0	0	0	60	60
	(0.0042)	(0)	(0)	(0)	(0)	(127)	(127)
Total harvest	0.2465	0	911	2,815	1,874	1,967	7,567
	(0.0840)	(0)	(684)	(1,072)	(1,587)	(1,311)	(2,420)
Angler hours		2,856	5,231	10,519	8,822	3,264	30,692
		(527)	(1,611)	(2,323)	(1,895)	(1,048)	(3,600)
Angler trips		764	1,436	3,553	2,815	1,208	9,776
		(154)	(475)	(797)	(842)	(423)	(1,331)

Table 3.-Total angler catch and release, fishing pressure and catch per hour, Au Sable River site 254 (Alcona Dam Pond) in 1999. Two standard errors are given in parenthesis.

Species	Catch/Hour	Apr24-May	June	July	August	September	Season
Walleye	0.0292 (0.0225)	148 (298)	0 (0)	254 (265)	313 (471)	180 (287)	895 (681)
Northern pike	0.0585 (0.0226)	444 (310)	292 (336)	649 (390)	321 (261)	91 (83)	1,797 (660)
Rock bass	0.1281 (0.1323)	6 (11)	646 (820)	631 (444)	2,644 (3,926)	6 (13)	3,933 (4,035)
Yellow perch	0.1983 (0.3247)	0 (0)	354 (225)	308 (361)	5,310 (9,929)	113 (150)	6,085 (9,939)
Largemouth Bass	0.0062 (0.0055)	0 (0)	33 (67)	94 (113)	62 (101)	0 (0)	189 (166)
Smallmouth Bass	0.1911 (0.1000)	11 (24)	391 (349)	2,410 (1,391)	1,490 (1,170)	1,564 (2,350)	5,866 (2,991)
Carp	0.0001 (0.0002)	0 (0)	0 (0)	0 (0)	0 (0)	4 (9)	4 (9)
Rainbow trout	0.0040 (0.0060)	0 (0)	0 (0)	123 (183)	0 (0)	0 (0)	123 (183)
Brook trout	0.0006 (0.0013)	0 (0)	0 (0)	19 (40)	0 (0)	0 (0)	19 (40)
Bluegill	0.2721 (0.1176)	0 (0)	1,393 (1,533)	4,330 (2,213)	1,943 (2,077)	684 (706)	8,350 (3,473)
Sunfish sp.	0.0141 (0.0154)	0 (0)	123 (233)	309 (408)	0 (0)	0 (0)	432 (470)
White sucker	0.0015 (0.0021)	0 (0)	0 (0)	47 (66)	0 (0)	0 (0)	47 (66)
Redhorse sp.	0.0020 (0.0042)	0 (0)	62 (130)	0 (0)	0 (0)	0 (0)	62 (130)
Total catch	0.9058 (0.3963)	609 (431)	3,294 (1,839)	9,174 (2,757)	12,083 (10,954)	2,642 (2,476)	27,802 (11,717)
Angler hours		2,856 (527)	5,231 (1,611)	10,519 (2,323)	8,822 (1,895)	3,264 (1,048)	30,692 (3,600)
Angler trips		764 (154)	1,436 (475)	3,553 (797)	2,815 (842)	1,208 (423)	9,776 (1,331)

Table 4.- Total angler harvest, fishing pressure and catch per hour, AuSable River site 254 (Alcona Dam Pond), summer 2000. All estimates are given with 2 SE in parentheses. Other species category may include sunfish, bluegill, suckers, bowfin, redhorse, carp, and catfish. Interview data from 1999 survey period were used to estimate 2000 harvest rates during August and September.

Species	Catch/hour	Apr29-May	June	Jul	Aug	Sep	Season
Walleye	0.0080	47	57	119	48	0	271
	(0.0055)	(61)	(88)	(114)	(96)	(0)	(184)
Northern pike	0.0120	0	332	12	48	17	409
	(0.0104)	(0)	(347)	(23)	(32)	(36)	(351)
Rock bass	0.0533	47	487	915	361	0	1,810
	(0.0443)	(51)	(562)	(1,243)	(598)	(0)	(1,490)
Yellow perch	0.0343	11	154	642	0	358	1,165
	(0.0217)	(24)	(180)	(559)	(0)	(424)	(725)
Largemouth bass	0.0015	0	40	12	0	0	52
	(0.0025)	(0)	(83)	(23)	(0)	(0)	(86)
Smallmouth bass	0.0222	11	519	12	164	46	752
	(0.0162)	(25)	(443)	(23)	(298)	(90)	(543)
Rainbow trout	0.0023	0	79	0	0	0	79
	(0.0030)	(0)	(104)	(0)	(0)	(0)	(104)
Other	0.1289	71	664	1,687	872	1,082	4,376
	(0.0616)	(93)	(607)	(1,377)	(1,019)	(908)	(2,034)
Total harvest	0.2626	187	2,332	3,399	1,493	1,503	8,914
	(0.0849)	(127)	(1,029)	(1,941)	(1,223)	(1,007)	(2,711)
Angler hours		5,405	6,808	11,514	7,390	2,826	33,943
		(1,382)	(1,600)	(2,337)	(1,867)	(737)	(3,736)
Angler trips		1,531	1,831	3,183	2,327	1,021	9,893
		(421)	(462)	(685)	(743)	(284)	(1,222)

Table 5.- Total angler catch and release, fishing pressure and catch per hour, AuSable River site 254 (Alcona Dam Pond), summer 2000. All estimates are given with 2 SE in parentheses. Other species category may include sunfish, bluegill, suckers, bowfin, redhorse, carp, and catfish. Interview data from 1999 survey period were used to estimate 2000 catch rates during August and September.

Species	Catch/hour	Apr29-May	June	Jul	Aug	Sep	Season
Walleye	0.0333	48	86	602	260	134	1,130
	(0.0197)	(63)	(174)	(391)	(379)	(210)	(612)
Northern pike	0.0569	403	628	481	315	103	1,930
	(0.0257)	(498)	(303)	(356)	(262)	(101)	(739)
Rock bass	0.0714	233	97	35	2,050	10	2,425
	(0.0893)	(251)	(120)	(53)	(2,963)	(23)	(2,977)
Yellow perch	0.1399	11	350	305	3,977	107	4,750
	(0.2226)	(25)	(219)	(318)	(7,461)	(137)	(7,472)
Largemouth bass	0.0079	11	17	178	62	0	268
	(0.0057)	(25)	(35)	(144)	(102)	(0)	(182)
Smallmouth bass	0.1626	579	686	1,897	1,170	1,187	5,519
	(0.0742)	(328)	(326)	(781)	(900)	(1,721)	(2,144)
Rainbow trout	0.0005	0	17	0	0	0	17
	(0.0010)	(0)	(34)	(0)	(0)	(0)	(34)
Brook trout	0.0247	0	839	0	0	0	839
	(0.0311)	(0)	(1,038)	(0)	(0)	(0)	(1,038)
Other	0.1721	173	17	3,342	1,658	652	5,842
	(0.1032)	(327)	(35)	(2,964)	(1,616)	(583)	(3,442)
Total release	0.6694	1,458	2,737	6,840	9,492	2,193	22,720
	(0.3127)	(729)	(1,171)	(3,130)	(8,252)	(1,837)	(9,120)
Angler hours		5,405	6,808	11,514	7,390	2,826	33,943
		(1,382)	(1,600)	(2,337)	(1,867)	(737)	(3,736)
Angler trips		1,531	1,831	3,183	2,327	1,021	9,893
		(421)	(462)	(685)	(743)	(284)	(1,222)

Table 6. Species and relative abundance of fishes collected with gear during the June 9-12, 2003 survey at Alcona Dam Pond.

Common Name	Number	Percent	Length Range (inches)	Weight*	Percent	Growth**
Rock bass	260	22	1-9	51.6	5	Average
Sand shiner	250	22	1-3	1.5	-	-
Brown bullhead	144	12	8-15	122.8	12	-
Bluegill	134	12	1-7	15.0	1	Below average
White sucker	65	6	8-21	152.3	15	-
Bowfin	61	5	20-27	305.4	30	-
Northern pike	53	5	10-38	142.8	14	Average
Yellow perch	39	3	5-13	18.2	2	Above average
Golden shiner	22	2	2-5	0.2	-	-
Bluntnose minnow	20	2	1-2	0.1	-	-
Greater redhorse	19	2	17-27	99.0	10	-
Smallmouth bass	19	2	9-19	36.6	4	Below average
Black crappie	14	1	7-14	12.6	1	Average
Black bullhead	13	1	1-14	9.6	1	-
Yellow bullhead	13	1	9-15	11.0	1	-
Walleye	11	1	14-28	~35.0	3	-
Pumpkinseed	8	1	4-6	1.7	-	-
Largemouth bass	4	-	7-16	4.3	-	-
Creek chub	3	-	1-4	--	-	-
Carp	2	-	20-28	~8.0	1	-
No. redbelly dace	2	-	2	--	-	-
Banded killifish	1	-	2	--	-	-
Northern hogsucker	1	-	2	--	-	-
TOTAL	**1,158**			**1,028**		

*Weights were calculated, not actual measurements
**Growth is compared to the statewide average for that species

Table 7. Length-frequency distribution of important game fishes collected during the June 2003 netting survey at Alcona Dam Pond. Walleye from the fall 2003 electrofishing survey are also included.

Length (in)	Bluegill	Northern pike	Rock bass	Smallmouth bass	Walleye	Yellow perch
1	7		14			
2	34		3			
3	7		4			
4	10		14			
5	24		51			6
6	39		112			6
7	13		48			2
8			13			2
9			1	2		6
10		1		3		2
11						6
12						5
13						4
14				3	2	
15				3	1	
16		1		3		
17		3		2		
18		2		1	1	
19		4		2		
20		7			1	
21		9			2	
22		6				
23		7				
24		3			1	
25		2			2	
26		3				
27		3			1	
28		1				
≥29		1				