Loon Lake
T23N, R05E, 3,4,9,10
East Branch AuGres River watershed, 2011

Kathrin Schrouder, Fisheries Biologist

Environment

Loon Lake is located in Iosco County, about 2 miles north of Hale off of M-65 (Figure 1). The lake outlets to Smith Creek which flows to the East Branch AuGres River. There is an intermittent creek, Magie Creek, coming into the lake. Records indicate no lake level control structure to be present. The East Branch AuGres becomes Whitney Drain and discharges to Saginaw Bay of Lake Huron north of Point Lookout.

The surrounding countryside is hilly, agricultural land, and partly wooded. The dominant soils in the watershed are the sandy loams and groups of sandy loams including Curtisville Sandy Loam, Morgan Lake Nester Complex, Menominee Curtisville Complex, Nester Sandy Loam, Rubicon Sand, and a smaller portion of Tawas Lupton Muck. The slope in the area is variable with much of it being 18-35 % with lesser area of 6-12%. These soils are characteristic of moraine areas and are generally well drained. The dominant land use around the lake is a mixture of forested, agricultural, and rural residential. The immediate shoreline and area is dominated by residences and a few large camps. The shoreline-habitat survey in 2011 counted 150 dwellings, in 4.37 miles; ~45 dwellings per mile. Shoreline development was sparse, with just under 10% of the shoreline displaying some sort of armoring, mostly in the form of steel, wood, or concrete seawalls.

Loon Lake is 417 acres (Figure 2). Approximately 17% of the lake is shallow, but it has a maximum depth of 128 ft. The lake drops off very steeply. The bottom in the shoals is mostly sand, gravel, marl and fibrous peat; in the depths it is pulpy peat. Vegetation is limited overall but common in the shallower areas. Vegetation presently includes milfoil, pondweed, chara, algae and lily pads. Additional fish habitat is also provided by docks. The 2011 habitat survey enumerated 80 small docks, 43 large docks, and 47 submerged logs around the lake.

In general, Loon Lake is classified as a warmwater, medium size, stratified, deep lake of oligotrophic characteristics. August 2011 measurements of Secchi disk depth (14 ft.), total phosphorus (19.3 ug/l), and chlorophyll-a (1.01 ug/l) yielded a Trophic Status Index (TSI) of 39.82 on a scale of 0-80 (Carlson 1996). This TSI is just at the more productive end of the oligotrophic lake classification. Oligotrophic lakes are generally defined as those with lower levels of productivity, low to medium levels of nutrients, clear water, and generally supporting a less productive aquatic community.

Temperature, oxygen, and pH profiles were conducted on Loon Lake in August, 2011 (Table 1). These profiles show strong thermocline development at 18 feet, well oxygenated waters down to 36 feet, and pH ranging from 6.84 at the bottom to 7.22 on the surface. Dissolved oxygen concentrations in the water column appear to be a problem for fish (<3 mg/l) at depths beyond 84 feet. Alkalinity was 104 ppm, indicating average buffered water.

Public access to Loon Lake was previously from a road and private camp along the east end of the lake. Plainfield Township secured DNR grants and improved the access and trail area including a boat ramp, parking, toilet building, trails, and a boardwalk to another small lake and wetland area. This was completed in 2008.

History

Loon Lake has management records dating back to 1937. Records indicate that walleye and perch were stocked from 1937 to 1942. The first survey records or management accounts were dated 1949. Species captured included northern pike, yellow perch, walleye, largemouth bass, bluegill, pumpkinseed sunfish, rock bass, black crappie, and white sucker. A limnological survey was also conducted in 1949. The thermocline was measured at around 20 feet. Alkalinity ranged from 117 to 146. pH ranged from 7.2-8.4. The water was well oxygenated until 30 feet but then became limiting. In 1950, 2000 adult (LP-clipped) rainbow trout were stocked. Records indicated yearling rainbow trout were also stocked in 1980 and 1981 (Table 2). The final entry on the management record recommended the acquisition or development of a public fishing site in 1961, but none was officially developed until 2008. This site is currently maintained and operated by Plainfield Township. A hook and line survey was conducted in 1964. This indicated a large number of cisco to be present. A survey was conducted in 1981 to evaluate the rainbow trout plants. This survey failed to document a successful rainbow trout population but did document additional species including smelt and brown bullheads, and once again documenting a fairly substantial cisco population. The survey did mention that some rainbow were caught hook and line earlier in the summer while night fishing. Based on the survey findings it was recommended to discontinue the rainbow trout stocking due to poor survival. The reason for this is most likely the large northern pike population and their ability to prey upon the trout.

In 1991 management direction shifted toward management for walleye. A private plant of 2600 walleye fall fingerlings was made. The State followed up by stocking spring fingerlings in 1992 and 1993. A night electrofishing survey was conducted in September 1993 to evaluate the walleye stocking program. Walleye survival was evident as 14 were documented. This survey additionally documented smallmouth bass to be present. Walleye stocking was continued in 1995 and again in 1999. Another stocking evaluation was conducted in 1999 and the numbers of young of the year walleye captured and observed were remarkable. A total of 396 walleye were captured or observed in 6700 seconds or in 3.4 miles indicating excellent survival. Walleyes were additionally stocked in 2001, 2004, 2006, and 2009 (Table 2).

The Michigan Department of Environmental Quality (DEQ) conducted an aquatic plant survey of Loon Lake in 1998. This documented chara, Eurasian milfoil, native milfoil, sago pondweed, flatstem pondweed, Illinois pondweed, largeleaf pondweed, wild celery, coontail, southern naiad, white water lily, yellow water lily, pickerelweed, cattail, and bulrush. At the time of this survey, 37% of the shoreline had stands of emergent vegetation which didn't seem to be a problem. The survey did note that there was a heavy band of Eurasian milfoil occupying the 5-15 ft. contour which comprised almost 80% of this portion of the lake. Vegetation management was directed to target and control this band of Eurasian milfoil. The lake association has been treating Loon Lake for aquatic nuisance plants ever since.

Current Status

In June, 2011, Fisheries Division conducted a fisheries assessment on Loon Lake as part of the Fisheries Division's Status and Trends Monitoring Program. The Status and Trends Monitoring Program seeks to randomly sample various sized lakes, using similar protocol, to determine trends among lakes at the regional and statewide levels.

Status and Trends protocol incorporates a variety of gear to sample the fish community during the time of year when water temperature is within a recommended range (55º-80º F). Large mesh trap and fyke nets are used to capture larger (>3 inches) species that inhabit the littoral zone or that move inshore at night. Gill nets are used to sample fishes that occupy offshore waters and are particularly effective at capturing perch, salmonids, and northern pike. Night electrofishing is used to capture all size ranges of species and life stages that inhabit the littoral zone or that move inshore at night. Seining is used to capture representative samples of small-bodied nongame species and smaller size classes (<3 inches) of sport fishes that inhabit the littoral zone. Collectively, the catch from these gears presents a general picture of the overall fish community.

A total of 2598 (573 lbs) representing 18 species and one hybrid were collected in the 2011 assessment (Table 3). Electrofishing accounted for 20% of the total catch, while trap nets, fyke nets, gill nets, and seine accounted for 17%, 56%, 1.7%, and 5.2%, respectively. Bluegill were the most abundant species collected, comprising 28% of the total catch. Rock bass, pumpkinseed sunfish, yellow perch, and largemouth bass were also very abundant. Other species collected in medium abundance included bullhead, smallmouth bass, northern pike, bluntnose minnow, and walleye. Relatively less abundant species included tadpole madtom, green sunfish, logperch, Johnny darter, golden shiner, banded killifish, and common white sucker.

A total of 739 bluegill averaging 5.0 inches were collected in the 2011 assessment (Table 3). Twenty-two percent of the bluegill catch was captured with trap net gear compared to 5.4% captured with electrofishing gear. Average size of the bluegill trap net catch was 6.4 inches, compared to 4.7 inches with electrofishing gear, which is able to capture smaller fish. Seventy one percent of the trap net catch met or exceeded the acceptable harvest size of 6 inches, compared to 12.5% of the electrofishing catch. Bluegill size structure was dominated by fish in the 2-7 inch size range. Age and growth analysis indicated bluegill were growing slightly below State average having a mean growth index of -0.5 (Table 4). Age frequency showed good representation of ages 1-7. Bluegill as old as age 7 were observed in the catch, suggesting older fish likely experience mortality either by harvest or natural causes.

A total of 429 pumpkinseed sunfish averaging 4.5 inches were collected in the 2011 assessment (Table 3). Eight percent of the total catch met or exceeded the acceptable harvest size of 6 inches. Age and growth analysis indicated pumpkinseed sunfish were growing slightly below State average, having a mean growth index of -0.2 (Table 4). Six year classes were present.

A total of 615 rock bass averaging 6.3 inches were collected in the 2011 assessment (Table 3). Twenty-eight percent of the rock bass catch was captured with trap net gear. Rock bass size structure

was dominated with fish in the 6 inch to 9 inch size range. Fifty-four percent of the rock bass met or exceeded the acceptable harvest size of 6 inches. Age and growth analysis indicated rock bass were growing slightly above State average having a mean growth index of +0.1 (Table 4). Age frequency showed representation of ages 1-11. Eleven year classes were represented in the survey catch.

A total of 75 largemouth bass averaging 11.4 inches were collected in the 2011 assessment (Table 3). Forty-four percent of the total largemouth bass catch was captured with fyke nets compared to 40 % with trap nets, 16% with electrofishing, and 0% with gill nets. Average size of the electrofishing catch was 13.9 inches, average size of the trap net catch was 12.8 inches, and average size of the fyke net catch was 9.2 inches. Largemouth bass size structure was fairly evenly distributed from 7-18 inches. Eight inch fish were dominant. Twenty-eight percent of the largemouth bass catch met or exceeded the legal harvest size of 14 inches. Age and growth analysis indicated largemouth bass were growing above State average, having a mean growth index of +1.1 (Table 4). Largemouth bass were represented by 11 year classes.

In addition to largemouth, 12 smallmouth bass were captured representing an additional 0.5% of the total catch (Table 3). Smallmouth bass ranged from 3-20 inches and averaged 14.0 inches. Fifty percent of the smallmouth bass met or exceeded the legal harvest size of 14 inches. Seven year classes of smallmouth bass were captured but insufficient numbers were collected to calculate a mean growth index. Ages 1-5, 8, and 10 were represented in the catch.

A total of 146 yellow perch averaging 5.0 inches were collected in the 2011 assessment (Table 3). Eighty-nine percent of the yellow perch catch was captured with electrofishing gear. Yellow perch size structure was dominated by fish in the 3-6 inch size range. Only 9% of the catch met or exceeded the acceptable harvest size of 7 inches. Age and growth analysis indicated yellow perch were growing below State average, having a mean growth index of -0.9 (Table 4). Age frequency showed representation of ages 1-5. Inland lake surveys rarely capture large numbers of larger, older yellow perch.

Twenty-three walleye averaging 16.2 inches were collected in the assessment (Table 3). Forty-three percent of the walleye catch met or exceeded the legal harvest size of 15 inches. Nine year classes of walleye were represented in the catch indicating both survival of stocked fish and survival of naturally reproduced fish. Walleye growth remains well above State average, having a growth index of +1.2.

Twenty-six northern pike averaging 23.1 inches were collected in the 2011 assessment (Table 3). Fifty-four percent of the northern pike catch were captured with gill net gear and 44% with trap and fyke net gear. Average size of the gill net catch was 23.2 inches and average size of the trap net catch was 21.9 inches. Northern pike size structure was 20-26 inch fish. Thirty-eight percent of the northern pike collected met or exceeded the legal harvest size of 24 inches. Northern pike were represented by 6 year classes (ages 1, 3-7) (Table 4). Northern pike were found to be growing slowly with a mean growth index well below State average, at -1.3.

Brown and yellow bullhead were common in the survey catch. Collectively they represented almost 3% of the survey catch. They ranged from 7 to 14 inches and averaged over 11 inches. These bullhead can provide anglers another species to target and can provide some predatory control on juvenile panfish.

White sucker were also captured but in low numbers. Other species collected were in very low abundance and may not significantly contribute to the sport fishery.

Bluntnose minnow, banded killifish, golden shiner, logperch and Johnny darter represent the nongame forage base.

Analysis and Discussion

The Loon Lake fish community has never been completely assessed prior to this survey. Earlier surveys were only made to document the success or survival of walleyes that were previously stocked. Bluegill were the most abundant species. Pumpkinseed sunfish and rock bass were also very abundant. These offer anglers excellent panfish opportunities. Walleye, smallmouth bass, largemouth bass, northern pike, and yellow perch occur in lesser abundance but provide additional angling opportunities.

Bluegill are typically the most abundant fish species present in many lakes in the region and play a key role in community structure and overall sport fishing quality (Schneider 1981). Schneider (1990) suggests indices of bluegill characteristics can be used to classify populations. The "Schneider Index" uses size scores of length frequency and growth data and relates them to an subjective ranking system ranging from "very poor" to "superior". Using the Schneider Index for classifying bluegill populations, Loon Lake scored 4.0 for a "satisfactory" rating (Table 5). There appears to be adequate numbers of larger bluegill for anglers to catch.

The species that should be highlighted in this lake is rock bass as they exhibit excellent growth and attain very desirable sizes. These, together with the bluegill and pumpkinseed, offer anglers great opportunities for panfishing.

Largemouth bass and smallmouth bass represent two of the primary predator fish in Loon Lake. Numbers of largemouth bass appear higher and their size structure shows them to be well distributed in most length groups. Growth of bass was good. Smallmouth were also well distributed in length frequency but not as many were caught and growth could not be calculated.

The catch rate, size structure, and growth of walleye indicate a fairly stable population. The 23 walleye captured ranged from 9 to 25 inches. Forty-three percent were legal size or 15 inches or greater. There were 9 year classes represented, suggesting survival of stocked fish and evidence of naturally reproduced fish. Walleye growth is excellent. The mean growth index was +1.2. There are large walleyes available for anglers to catch. There are several rocky shoals where walleye can reproduce.

Loon Lake also appears to have a decent northern pike population. Twenty-six were netted and they ranged from 13-26 inches. Pike reproduction does not appear to be a problem as there are many year classes present in the survey catch. Northern pike are growing below State average but this is not uncommon for lakes in our region.

Yellow perch were found in appreciable numbers and their size structure and age distribution appears to be relatively healthy. The current fishery only offers an opportunity for incidental catch of yellow perch of harvestable size.

No ciscoes or rainbow smelt were captured or seen during this survey. Anglers have also not reported any in recent times. Most likely these species are now extirpated. The decline of these species in inland lakes is often due to changing ecological conditions limiting their survival or it can be from the effects of predation. The limnology in August 2011 showed adequate oxygen and temperatures for these species, suggesting that another factor caused them to disappear from the fish community. Perhaps predation by several species including northern pike and walleye caused this decline and eventual extirpation as both pike and walleye are excellent predators on these species. Early surveys indicated a rainbow trout community which was also compromised near this time due to predation and the increase in northern pike. Walleye were subsequently stocked on top of this already increasing pike population.

Management Direction

Management direction on Loon Lake should continue for warm and cool water species. Specific management for bluegill, northern pike, smallmouth bass, largemouth bass, pumpkinseed sunfish, rock bass, and yellow perch is not warranted as all of these species are self sustaining.

A fisheries management prescription for Loon Lake recommends stocking walleye biennially to help maintain this population. This prescription recommends stocking 20,850 walleyes biennially (50 per acre) according to the Southern Lake Huron walleye stocking strategy.

References

Carlson, R.E. and J. Simpson. 1996. A Coordinator's Guide to Volunteer Lake Monitoring Methods. North American Lake Management Society. 96 pp. http://www.secchidipin.org/tsi.htm

Fuller, L.M., and Minnerick, R.J., 2008. State and regional water-quality characteristics and trophic conditions of Michigan's inland lakes, 2001-2005: U.S. Geological Survey Scientific Investigations Report 2008-5188, 58 p.

Schneider, J.C. 1981. Fish communities in warmwater lakes. Michigan Department of Natural Resources, Fisheries Division, Fisheries Research Report 1890, Ann Arbor.

Schneider, J.C., 1990. Classifying bluegill populations from lake survey data. Michigan Department of Natural Resources, Fisheries Technical Report No. 90-10, Ann Arbor.

Figure 1. Map showing the location of Loon Lake, Iosco County.

Figure 1. Map showing the location of Loon Lake, Iosco County.

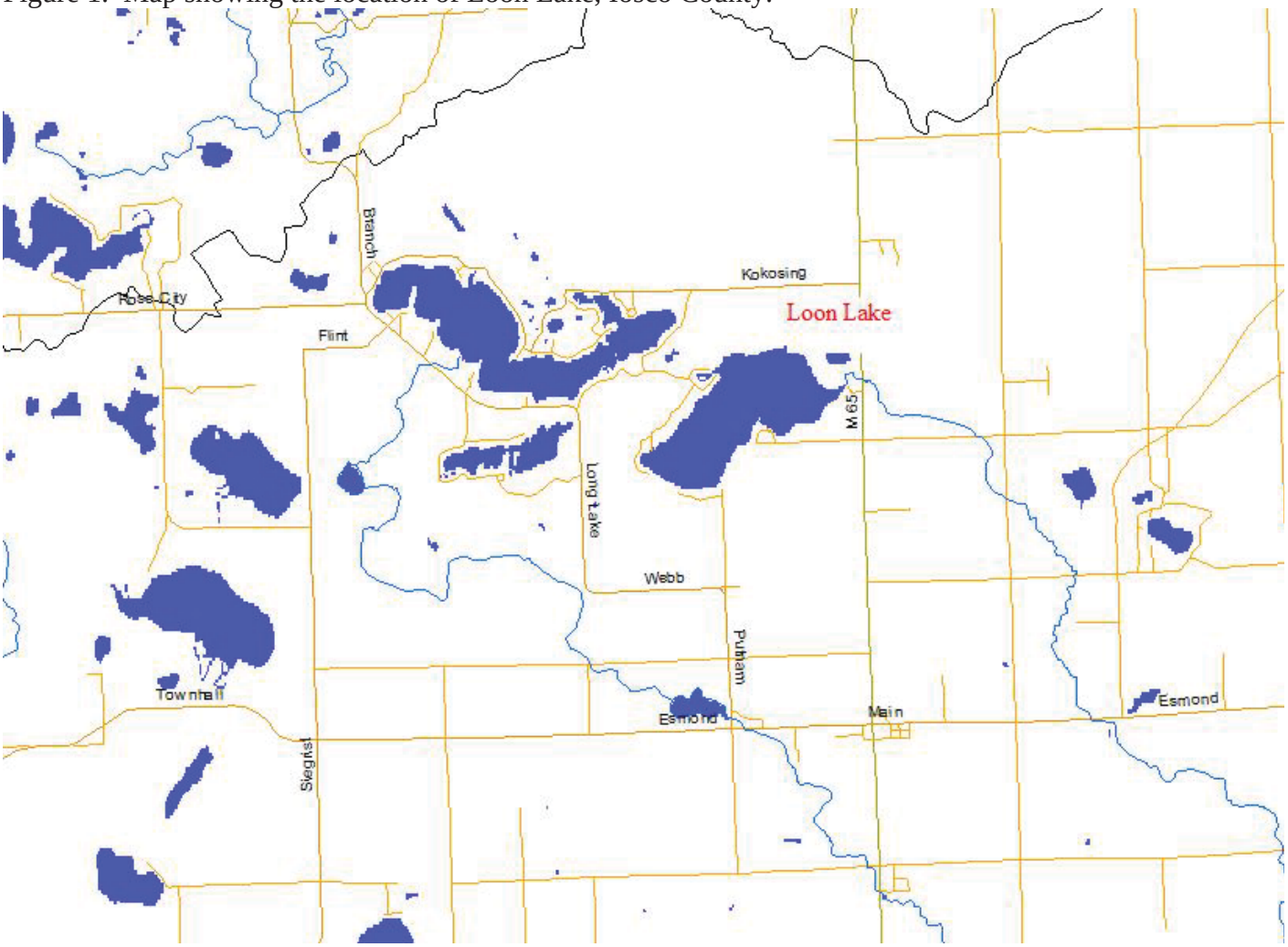

Figure 2. Bathymetric map of Loon Lake, showing the 2011 survey gear locations.

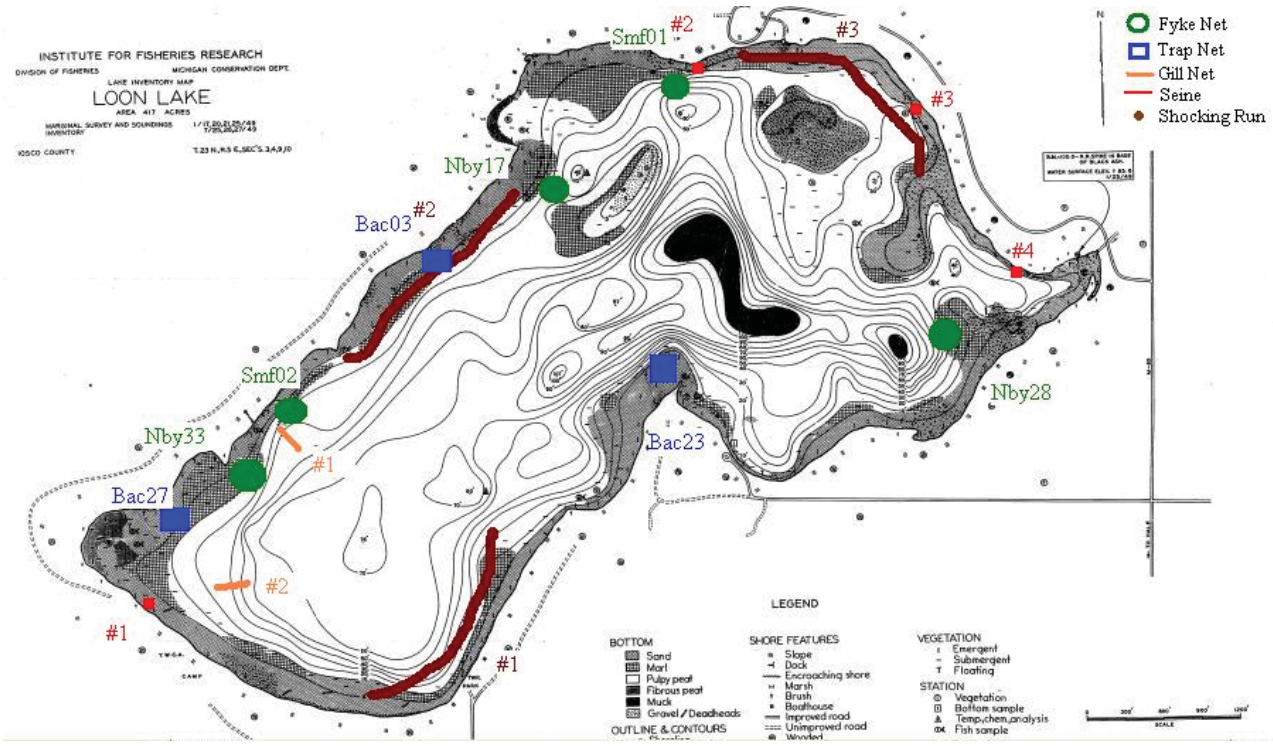

Table 1. Limnological parameters measured from Loon Lake, Iosco County, 2011.

Depth (ft.)	Temperature (°F)	Oxygen (ppm)	pH
0	78.82	9.65	8.53
3	78.8	9.67	8.52
6	78.74	9.65	8.54
9	78.65	9.61	8.54
12	78.59	9.59	8.51
15	78.49	9.53	8.55
18	72.91	10.21	8.36
21	62.95	9.77	7.85
24	57.61	8.6	7.64
27	53.18	8.83	7.53
30	48.29	7.8	7.39
33	46.08	6.17	7.28
36	45.05	5.42	7.23
39	44.76	5.11	7.24
42	44.37	5.1	7.24
44	44.08	5.07	7.24
48	43.89	4.92	7.24
51	43.83	4.91	7.23
54	43.75	4.88	7.24
57	43.68	4.67	7.22
60	43.67	4.5	7.23
63	43.64	4.36	7.23
66	43.62	4.23	7.22
69	43.6	4.17	7.21
72	43.58	3.94	7.2
74	43.56	3.71	7.21
78	43.54	3.35	7.19
81	43.52	3.18	7.17
84	43.49	2.89	7.17
87	43.48	2.37	7.15
90	43.48	1.35	7.14
93	43.47	1	7.14
96	43.41	0.73	7.01
96.4	43.5	0.35	6.94

Table 2. Species stocked in Loon Lake, Iosco County (1979-2011).

Species ***Strain***	**Date**	**Number**	**Avg. Length (in.)**
Rainbow trout	5/8/1980	1,000	7.08
Rainbow trout *Harrietta*	5/7/1981	5,000	7.88
Walleye	9/18/1991	2,600	3.56
Walleye *Ohio*	6/13/1992	34,540	1.28
Walleye *Muskegon*	7/6/1993	18,620	1.8
Walleye *Muskegon*	10/11/1995	10,500	3.56
Walleye *Tittabawassee*	6/8/1999	40,050	2.04
Walleye *Tittabawassee*	6/16/2001	44,983	1.52
Walleye *Tittabawassee*	6/15/2004	24,640	1.88
Walleye *Tittabawassee*	6/8/2006	21,968	2.032
Walleye *Muskegon*	6/9/2009	24,367	1.604

Table 3.-Number, weight, and length range of fishes collected with trap net, fyke net, gill net, seine, smallmesh fyke nets and electro-fishing gear from Loon Lake, Iosco County in 2011. Data from Michigan Department of Natural Resources, Fisheries Division records.

Species	Number	Percent by number	Weight (lb.)	Percent by weight	Length range (in.)	Average length (in.)	Percent legal size*
Banded killifish	35	1.3	0.2	0	2-2	2.5	--
Bluegill	739	28.4	84.1	14.7	1-8	4.9	37
Bluntnose minnow	332	12.8	1.8	0.3	2-2	2.5	--
Brown bullhead	38	1.5	27.6	4.8	7-13	11.4	100
White sucker	4	0.2	6.4	1.1	10-19	15	100
Golden shiner	5	0.2	0.2	0	4-5	4.7	--
Green sunfish	24	0.9	2.1	0.4	1-7	4.6	13
Hybrid Sunfish Hybrid	49	1.9	4.9	0.9	2-7	5	12
Johnny darter	1	0	0	0	2-2	2.5	--
Largemouth bass	75	2.9	78	13.6	7-19	11.4	28
Logperch	1	0	0	0	3-3	3.5	--
Northern pike	26	1	72.6	12.7	13-26	23.1	38
Pumpkinseed	429	16.5	36.5	6.4	1-9	4.5	8
Rock bass	615	23.7	156.5	27.3	1-11	6.3	54
Tadpole madtom	9	0.3	0.1	0	2-3	2.8	--
Walleye	23	0.9	42.3	7.4	9-25	16.2	43
Yellow Perch	146	5.6	10.2	1.8	2-12	5	9
Yellow bullhead	35	1.3	25.7	4.5	8-13	11.5	100
All species totals:	**2,598**		**573**				

* Percent acceptable to anglers or of legal size.

Table 4.-Weighted mean length (inches) at age, and growth relative to the State average for fish sampled from Loon Lake by all gear types, 2011. Data from Michigan Department of Natural Resources, Fisheries Division records.

Species / Age	No. aged	Length range (in.)	State avg. length (in.)	Weighted mean len. (in.)	Weighted age freq.	Mean growth index*
Bluegill						-0.5
Age I:	24	1.8-2.2	2.4	2.08	19.22%	
Age II:	8	3-3.6	4.2	3.15	11.37%	
Age III:	14	3.6-8	5.3	4.57	21.57%	
Age IV:	18	3.9-8.3	6.2	6.33	30.59%	
Age V:	9	5-7.9	6.9	6.61	15.64%	
Age VI:	3	7.3-8.4	7.4	7.47	1.49%	
Age VII:	1	8.9-8.9	8	8.9	0.14%	
Largemouth bass						1.1
Age II:	35	7.5-12.5	8.7	8.83	61.38%	
Age III:	10	7.7-16.8	10.6	12.56	13.60%	
Age IV:	3	12.3-15.3	12	13.46	3.56%	
Age V:	2	16-16.2	13.7	16.1	2.40%	
Age VI:	2	16.5-16.7	15	16.6	2.40%	
Age VII:	2	16-18	16.7	16.96	2.31%	
Age VIII:	3	16.7-16.9	17.6	16.83	3.60%	
Age IX:	4	16.7-18.3	18.6	17.63	4.76%	
Age X:	3	18.5-18.8	19.3	18.67	3.33%	
Age XI:	1	17.7-17.7		17.7	1.33%	
Age XVII:	1	19.3-19.3		19.3	1.33%	
Northern pike						-1.3
Age I:	1	13.5-13.5	14.5	13.5	3.85%	
Age III:	12	20.5-24.9	21.8	22.4	39.01%	
Age IV:	6	21.5-24.8	24.2	23.52	19.78%	
Age V:	2	26.1-26.3	26.1	26.2	7.69%	
Age VI:	7	21.1-26.6	27.8	24.12	22.53%	
Age VII:	2	23.5-24.5	30	23.96	7.14%	
Pumpkinseed						-0.2
Age I:	11	2-2.8	2.4	2.25	11.74%	
Age II:	7	3.2-3.8	4.2	3.49	14.62%	
Age III:	26	3.7-6.4	5.2	4.64	63.74%	
Age IV:	8	4.4-6.5	5.8	5.44	6.76%	
Age V:	8	6.6-7.9	6.3	7.25	2.90%	

Age IX:	1	9.5-9.5		9.5	0.23%	
Rock bass	0.4	5				0.1
Age I:	11	1.6-2.1	3	1.82	7.64%	
Age II:	1	3.1-3.1	4.3	3.1	0.45%	
Age III:	27	3.1-5.9	5.4	5.06	37.60%	
Age IV:	15	6.2-7.8	6.4	6.92	24.65%	
Age V:	6	7.6-8.9	7.2	7.93	9.33%	
Age VI:	16	8-11.3	8.1	8.78	13.90%	
Age VII:	3	8.8-10.9	8.8	9.16	2.18%	
Age VIII:	4	9.4-10.5	9.4	9.93	1.58%	
Age IX:	7	10.1-11.5		10.65	1.87%	
Age X:	2	11.4-11.7		11.55	0.33%	
Age XI:	2	10.6-11.4		10.88	0.47%	
Smallmouth bass						--
Age I:	1	3.3-3.3	5.5	3.3	9.09%	
Age II:	4	8.6-13.8	8.8	10.18	36.36%	
Age III:	2	13.8-16.4	11.1	15.1	18.18%	
Age IV:	1	17.2-17.2	13	17.2	9.09%	
Age V:	1	17.9-17.9	14.7	17.9	9.09%	
Age VIII:	1	20.5-20.5	17.4	20.5	9.09%	
Age X:	1	20.9-20.9	18.9	20.9	9.09%	
Walleye						1.2
Age I:	4	9-9.5	8.2	9.28	13.04%	
Age II:	8	11.5-13.5	11.4	12.64	39.13%	
Age III:	2	13.1-18.3	14.4	15.7	8.70%	
Age IV:	1	19.3-19.3	16.2	19.3	4.35%	
Age VI:	1	23.5-23.5	19.6	23.5	4.35%	
Age VII:	3	20.6-23.3	20.8	21.67	13.04%	
Age VIII:	2	21.3-21.6	21.7	21.45	8.70%	
Age X:	1	22-22	23.1	22	4.35%	
Age XI:	1	25.3-25.3		25.3	4.35%	
Yellow Perch						-0.9
Age I:	11	2.9-4.1	4	3.33	29.17%	
Age II:	8	4-4.5	5.7	4.18	29.24%	
Age III:	23	4.9-9.2	6.8	5.86	33.66%	
Age IV:	7	6.1-10.2	7.8	7.19	7.24%	
Age V:	1	10.7-10.7	8.7	10.7	0.69%	

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

Table 5.-Loon Lake bluegill classification using trap and fyke net data and the Schneider Index (Schneider 1990). Size score is given in parentheses. Data from Michigan Department of Natural Resources, Fisheries Division records.

Sample date	6/6/2011
Sample size	436
Average length (inches)	6.1 (4)
% ≥ 6 inches	61 (4)
% ≥ 7 inches	21 (4)
% ≥ 8 inches	1.1 (4)
Schneider Index	4.0
Rank[1]	Satisfactory

[1]Rank: 1 = Very poor, 2 = Poor, 3 = Acceptable, 4 = Satisfactory, 5= good, 6 = Excellent, 7 = Superior