



Lake Independence, Marquette County

Lake Independence April 9, 2012 Electrofishing Effort

Introduction: A one-hour electrofishing effort was conducted on Lake Independence during the evening of April 9, 2012, for a general assessment of walleye presence and abundance within the lake.

- **History:** Lake Independence has a long history of walleye population fluctuations and sport angling success. An excellent summary of management efforts conducted here has been detailed in a 2006 analysis by Brian Gunderman, and this narrative is attached at the end of this 2012 analysis narrative.

For 2012, Fisheries Division staff had intended to conduct a spring walleye assessment, using fyke and trap nets. During the spring of 2012 however a fast spring warm-up caused all of the lakes in the Western Upper Peninsula to thaw early and we missed our window of opportunity for conducting a netting survey. As a way to gauge walleye presence, Fisheries staff conducted a one-evening survey effort on the east and south shore of Lake Independence.

- **Physical features:** See attached Gunderman 2006
- **Biological features:** See attached Gunderman 2006.

Methods and Materials: DC pulsed electrofishing boat with Crystal Falls staff of Mark Mylchreest, Jacob McWethy, and Jody Johnston. Electrofishing began at 8:00 p.m. and concluded at 10:00 p.m, targeting various areas of the lake and consisting of 60 minutes of electrofishing time.

Results: Walleye (N=115) were the primary fish found in this survey effort; with a few smallmouth bass (N=4), and one yellow perch and one freshwater burbot were also collected. Walleye sizes ranged from 8"-inches to 20"-inches with 42 of the 115 walleye being 15"-inches or larger (36% of the catch were legal).

Discussion: It is difficult to draw large conclusions about the fish assemblage of Lake Independence, from reviewing data from a one-hour electrofishing effort. The data does indicate that there is a presence of legal size walleye and walleye that are in the spawning size category. Age structures (dorsal spines) collected from these 2012 sampled walleye show fish ranging from age-1 through age-14. The last stocking of walleye in Lake Independence occurred in the summer of 2004 with 15,000 pond-reared fingerlings (1.72" length), so the presence of walleye 7 years and younger within this lake represents wild recruited fish. Age-8 walleye (N=13) from the 2004 stocking event were represented in higher proportions than walleye yearclasses from non-stocked years, however the presence of age-7 and younger walleye from non-stocked years shows that natural recruitment is sustaining the walleye composition within this lake's fishery.

Recommendations: Lake Independence is targeted for a spring 2014 netting effort. Further analysis of this fishery and recommendation for management direction will be determined following this next survey process.

Report submitted by: George Madison



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Lake Independence is located approximately 0.5 miles from Lake Superior. The lake has a maximum depth of 30 ft, and the littoral zone often extends several hundred yards offshore. Due to the shallow water and frequent wave action, the water is moderately turbid. Sand is the dominant substrate in shoal areas. Gravel patches exist along the eastern shore, while organics are common in McKenzie Bay. The Yellow Dog River is the major inlet, but four other streams (Johnson Creek - east shore, Alder Creek - south shore, and 2 unnamed tributaries - west shore) also flow into this lake. The Iron River is the only outlet. The Lake Independence Dam on the Iron River raises the lake level by about 6 to 8 ft. A sizeable walleye run occurs in the Iron River, but past attempts to pass walleye over the dam (using a fish ladder, dip nets, seines, etc.) have been labor intensive and largely ineffective. A marking study conducted in 1953 documented some movement of walleye from Lake Independence into the Iron River.

Walleye and northern pike are the main predators in Lake Independence, and the lake generally has provided decent fishing for both species. Although supplemental stocking has occurred in recent years, the walleye population has been sustained primarily by natural reproduction. Length-at-age analyses have indicated that walleye growth is much slower than the state average, and walleyes larger than 20 inches have been rare in past surveys. Growth of northern pike is close to the state average. Approximately 30% of the northern pike collected since 1978 have been of legal size (> 24 inches), and several fish larger than 40 inches have been captured. Smallmouth bass consistently have been captured in lower numbers than walleye or northern pike.

Recent Fish Stocking in Lake Independence

1998 - Private plants: 1,000 fall fingerling walleye; 5,300 fall fingerling black crappie; 6,000 fall fingerling bluegill

1999 - 44,875 spring fingerling walleye

2004 - 15,000 spring fingerling walleye

Twenty-two walleyes were found during the 2006 survey, and an additional 58 walleyes (9-20 inches) were collected during the subsequent sucker removal. The size structure of the walleye population was similar to that observed in previous surveys. Small "keeper-sized" walleyes (15-17 inches) were common, but larger fish were rare.

The northern pike population also has not changed appreciably since the last survey. Seventeen northern pike were captured during the survey effort, and 44 pike (9-43 inches) were found during the manual removal. Five of the fish captured during the removal were larger than 30 inches. The length-frequency of the catch suggests that Lake Independence still is providing a good fishery for northern pike.

Compared to past surveys, catch-per-effort (CPE) of smallmouth bass was relatively high. The 2006 survey effort occurred just prior to the bass spawning period (i.e. one of the best times to sample for bass). Smallmouth bass CPE during the manual removal was substantially lower, perhaps due to the arrival of a major cold front. Eighteen smallmouth bass were collected during the survey, and only 8 bass were captured during the removal. Approximately 78% of the bass collected during the 2006 survey were of legal size. Overall, the data indicate that Lake Independence probably provides at least a modest bass fishery, especially during late May-June.

The yellow perch fishery in Lake Independence has gone through a series of "ups" and "downs" since the first fisheries surveys were conducted. Fishing reports suggest that the perch population is in the middle of a "down" period. No perch were captured during the 2006 survey or during the manual removal. These netting efforts were not conducted during the best time to sample for yellow perch, but the complete absence of perch in the catch is surprising.

The survey timing also strongly influenced the catch of other panfish species. Rock bass (N = 87) move into shallow water earlier than most other panfish, so the preponderance of rock bass in the catch was expected. No bluegills or black crappies were collected during the 2006 survey. These species typically do not move into shallow water until late May or early June, so their absence in the catch does not necessarily indicate that the 1998 stocking efforts were unsuccessful.

In 1989, Michigan DNR removed 7,580 lb of suckers from the lake. Since that time, local constituents have continued to voice concerns regarding the sucker population in Lake Independence. White suckers made up 94% of the biomass during the 2006 survey. Removal efforts commenced on 05 May and continued through 15 May. During this period, 10,400 lb of suckers were removed in 91 net nights of effort.

Management Summary and Recommendations: Given the size of this lake, controlling sucker abundance through manual removals would be an enormous task. Although suckers are common, most surveys have not indicated that the species is overabundant. The 2006 survey was conducted during the sucker spawning period, which explains the high relative abundance of suckers. White suckers provide valuable forage for the northern pike in Lake Independence, so a severe reduction in sucker abundance probably is not desirable.

Due to the timing of the survey, it is difficult to draw accurate conclusions regarding the predator-prey balance in this lake. All available evidence suggests that the yellow perch population is at the low end of its cycle. To facilitate recovery of the yellow perch population, walleye stocking should be temporarily discontinued.

B. Gunderman 2006



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Michigan Dept. of
Natural Resources

Fish Collection System

Length Frequency

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All Gear Combined

Produced: January 31, 2013

Water: Lake Independence

County T/R/S: Marquette

Watershed: Iron (Yellow Dog)

51N 27W 24

Survey begin: 04/09/2012 end: 04/09/2012

Status: Completed

Survey purpose: Discretionary survey

Species/strain	Inch group	No. caught	Lbs. caught
Burbot	17	3	4.49
Avg. length: 17.5 in.	Sample totals:	3	4.49
Smallmouth bass	14	1	1.57
	15	1	1.92
	16	1	2.32
	17	1	2.77
Avg. length: 16 in.	Sample totals:	4	8.58
Walleye	8	1	0.19
	11	2	0.97
	12	12	7.53
	13	32	25.36
	14	26	25.6
	15	24	28.93
	16	9	13.12
	17	7	12.2
	20	2	5.63
Avg. length: 14.6 in.	Sample totals:	115	119.53
Yellow Perch	3	1	0.02
Avg. length: 3.5 in.	Sample totals:	1	0.02

Fisheries Division