

Comprehensive Fisheries Survey of Julia Lake, Oneida County Wisconsin during 2012.

Waterbody Identification Code 995000



John Kubisiak
Senior Fisheries Biologist
Rhinelander
March, 2013



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EXECUTIVE SUMMARY

A comprehensive fisheries survey was conducted in Julia Lake during spring and fall, 2012. We found high-density largemouth bass (population estimate, PE = 7.9 adults per acre) and northern pike, moderate-level stocked walleye (PE = 1.8 adults per acre) and muskellunge populations, and low numbers of smallmouth bass. The game species had small to moderate size and appeared to be in good condition. Panfish species were also abundant, with excellent bluegill, pumpkinseed, black crappie and yellow perch size structure. We found high catches of rock bass and bluegill, moderate catches of yellow perch and black crappie and lower numbers of pumpkinseed, bluegill x pumpkinseed hybrids and yellow bullhead. Non-game species in the catch include golden shiner, and white sucker. The stocked walleye fishery is present at moderate abundance, but is unlikely to increase to higher levels unless extended growth walleye continue to be stocked. Muskies are currently being stocked at 1 per acre in odd-numbered years. Largemouth bass were abundant, and stockpiled below 13 inches. A rule change to exempt largemouth bass from minimum length limits may improve bass growth rates and size structure. However panfish quality may decline if predator numbers are reduced.

Lake and location:

Julia Lake, south-central Oneida County, T36N R08E Sec12. Julia Lake is in the towns of Crescent and Pelican, about ½ mile south of Rhinelander. Julia is part of the Upper Wisconsin River watershed. It is listed as a seepage lake, but an unnamed stream (not marked on the topographic map) drains west to the Wisconsin River.

Physical/Chemical attributes (Andrews and Threinen 1966):

Morphometry: 238 acres with maximum depth of 19 feet.

Watershed: 1.8 square miles, including 44 acres of adjoining wetlands.

Lake type: Listed as a seepage lake, but stream outflow suggests spring lake.

Basic water chemistry: Very soft – alkalinity 11 mg/l, conductance 43 µmhos.

Water clarity: Clear water of moderate transparency.

Littoral substrate: 30% rubble, 25% sand, 20% gravel, 15% boulders and some muck.

Aquatic vegetation: dense in some areas.

Winterkill: none.

Boat landing: Town-owned asphalt and gravel ramp with roadside parking.

Other features: Shoreline 85% upland with a coniferous bog wetland adjoining part of the lake.

Purpose of Survey: Assess status of game and panfish species and develop management recommendations.

Dates of fieldwork: Walleye netting, March 21 – 27 2012. Panfish netting, May 21 – 25 2012. Electrofishing March 29, May 3, May 17 and September 26, 2012.

BACKGROUND

Six large-mesh and two small-mesh fyke nets were fished May 13 – 17 1957 for a total of 32 net-nights. Catch per net-night included 8 walleye, 0.125 muskellunge, 0.0625 northern pike. Rock bass were the most abundant panfish (1.9 per net-night), with low catch of bullheads, bluegill, perch, suckers and “sunfish”. Remarks indicate “...Lake shallow lacking cover walleyes very thin Captured spawning walleye female 13.2 inches. No minnows captured in small mesh net or noted along shore” (Wendt 1957).

Electrofishing on July 25 1960 (Morehouse 1960) resulted in a paragraph in the Oneida County annual report:

“An investigation was conducted here on July 25th to answer complaints of poor fishing and as a follow up of past survey operations. In the shocker check, an outstanding population of walleyes ranging in size from young of the year up to 18 inches in length was found, but none larger than 18 inches were noted. The forage supply seemed to be abundant and was made up of fathead minnows, shiners and sucker minnows which were distributed fairly even throughout the lake. This minnow population increase may be the result of the installation of minnow spawning devices placed there in 1958. Rock bass and perch were plentiful with a heavy hatch of this years perch showing up. The growth rate of all of the panfish was near normal. A few large and smallmouth bass were found and both were noted in the young of the year class. A good population of crayfish of all sizes covered the bottom in many areas and crayfish removal should be encouraged here. With forage on the increase, the walleye growth should improve and no management is being recommended at this time other than crayfish removal as mentioned above.”

Great Lakes Indian Fish and Wildlife Commission estimated an adult walleye population of 1.28 per acre in 1994.

Fall electrofishing surveys were conducted by Great Lakes Indian Fish and Wildlife Commission (GLIFWC) in 1993 and 94 and by DNR in 2000, 01, 04 and 2012. The 1994 survey followed a July 29 stocking of 10,010 walleye (5.4 inches), and captured 28.8 young-of-year (YOY) walleye per mile. Catch in the other surveys ranged from 0 to 1.9 YOY per mile, despite small fingerling walleye stocking in 2000, 2001 and 2004 (Table 2). Stocking of small fingerlings was discontinued after 2004 due to lack of performance, and the quota was changed to large fingerlings.

Large fingerling walleye were stocked in fall of 2006 (2,389 fish) and 2008 (2,376 fish) with fish that had been marked with oxytetracycline. Oxytetracycline is an antibiotic that permanently stains bones in a layer that is visible under ultra-violet light. Spring surveys were conducted in 2007 and 2009 to assess their overwinter survival. In 2007, a population of 1,398 ($\pm 24\%$, CV) age-1 walleye was estimated, and in 2009 the population was estimated to be 1,022 age-1 ($\pm 19\%$, CV) and 164 age-3 ($\pm 31\%$, CV) walleye. A sample of 55 fish in 2007 was found to be 100% hatchery origin, while in 2009, a sample of 35 fish was found to be 94% hatchery origin. The adult (8 inches and larger) largemouth bass population was also estimated to be 2,129 ($\pm 17\%$, CV) or 8.9 per acre in 2009, with length centered on 10.2 inches and very few fish reaching 13 inches.

METHODS

The ice was out on March 20, 2012, and 6 standard fyke nets (¾-inch mesh, bar measure) were set on March 21. Ice-out normally occurs about a month later, but 2012 had the earliest ice-out ever

recorded for Rhinelander area. These nets targeted walleye and northern pike. The nets were pulled on March 27, and effort totaled 36 net-nights. Five standard 3/4-inch nets and one 3/8-inch mesh (to capture smaller fish) were set May 21 and pulled May 25 for a total of 24 net-nights targeting panfish.

An electrofishing boat using alternating current was used to collect gamefish along the entire shoreline on March 29, May 3, May 17 and September 26, 2012.

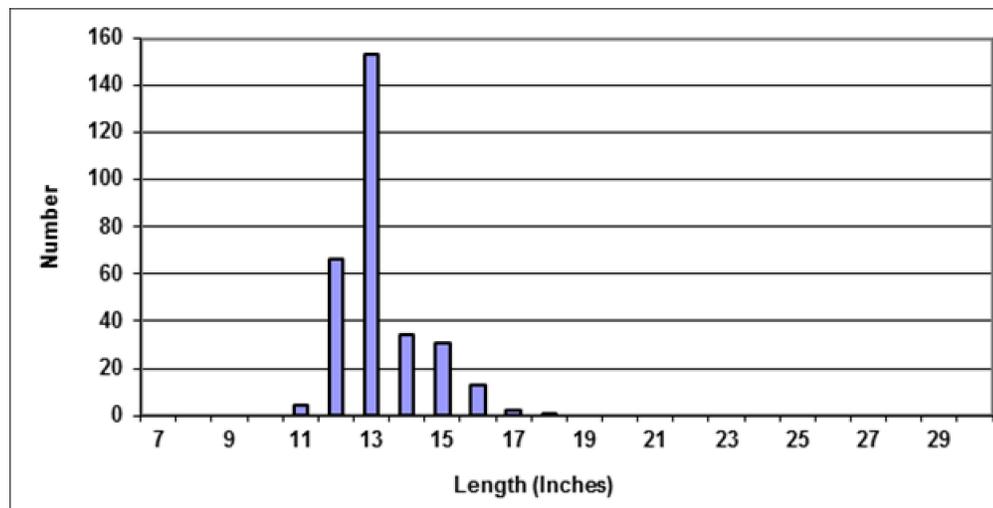
Length or length category (nearest half-inch) was recorded for all gamefish and for panfish in June. Adult gamefish captured in spring were given a left-ventral fin clip, except mature muskellunge less than 30 inches in length were given a left-pectoral fin clip. Juvenile gamefish were given a top-tail clip. Fin clips were used in calculating mark-recapture population estimates. Age structures (scales or spines) were removed from ten fish per species, per half-inch group.

RESULTS AND DISCUSSION

Walleye

During walleye netting, 458 walleye were captured in 6 nights, including 161 recaptures and 17 juvenile fish smaller than 15 inches, at a rate of 12.7 walleye per net night (Table 1). The electrofishing sample on March 29 yielded 72 walleye (15.6 fish per mile), including 10 juveniles. The mark-recapture population estimate of 433 adult walleye (± 38 SD), or 1.8 per acre, is above the predicted value of 1.5 per acre for a 238-acre lake supported by stocking. Adult walleye mainly originated from large fingerlings stocked in 2006 and 2008 (Table 2). Size was centered on a peak at 13 inches (likely age-4) with good numbers out to about 16 inches. There were very few larger fish (Figure 1). Only one walleye was aged at 6 (2006 yearclass), but about half the females were assigned age 5 (Appendix A). It is unclear how much of this discrepancy is due to mis-assigned ages, natural yearclasses, or poor survival of the 2006 fish.

Figure 1. Length-frequency of adult walleye during 2012 in Julia Lake, Oneida County WI.



Largemouth and Smallmouth Bass

We captured 521 largemouth bass during spring sampling, including 42 recaptures of previously-marked fish. The largemouth population (including all fish over 8 inches) was estimated at 1,872 (\pm

378 SD), or 7.9 per acre. This is high density for largemouth bass. Largemouth size structure was dominated by abundant 11 to 13-inch fish, while we only handled 3 fish over 14 inches (Figure 2). The longest largemouth was 16.6 inches in length. This is similar to an estimated 8.9 largemouth per acre in 2009, when only 5 of 479 largemouth were over 14 inches. Growth rates were also similar between 2009 and 2012, with near-average length-at-age through age 4 (10.5 inches, Appendix A), but very slow growth at older ages. The slow-growing largemouth are stockpiling under about 13 inches (Figure 2). Largemouth size would benefit from additional harvest of small fish under no minimum length limit. However, predation by over-abundant bass has likely helped create the current high-quality panfish size.

Fourty-three smallmouth bass (including 2 recaptures and 5 fish smaller than 8 inches) were captured during the survey. Average length was 10.9 inches, with only 2 fish over 14 inches (Figure 3). Smallmouth length-at-age was similar to the regional average through age 4. Growth slowed at older ages, but less severely than largemouth. Too few smallmouth were handled to attempt a population estimate.

Table 1. Catch per unit effort during a 2012 survey of Julia Lake, Oneida County WI. Netting catch rates are reported as number of fish per net night, while electrofishing catch rates are number of fish per mile of shoreline.

species	walleye netting	March 29 shocking	May 3 shocking	May 17 shocking	panfish netting
walleye	12.7	15.6	5.9	10.2	0.87
largemouth bass	1.9	9.8	35.4	31.1	4.3
smallmouth bass	0.083	1.3	2.2	4.3	0.17
muskellunge	0.36	2.8	2.4	0.87	0.33
northern pike	2.8	1.3	1.3	1.3	0.37
black crappie	2.9				2.8
bluegill	7.4				11.4
hybrid bluegill x pumpkinseed	0.42				0.58
golden shiner	0.083				0.75
pumpkinseed	0.14				1.5
rock bass	20.5				10.7
white sucker	1.1				0
yellow bullhead	0.055				0.37
yellow perch	5.6				0.29

Table 2. Fish stocking record during 1976 through 2012 in Julia Lake, Oneida County Wisconsin.

Year	Species	Size	Number	Comments
1976	muskellunge	lg fingerling (12 inch)	352	
1987	walleye	lg fingerling	12,000	
1988	walleye	sm fingerling	12,000	
1989	walleye	fingerling (2-4 inch)	17,096	06/30 & 10/24/1989
1990	walleye	sm fingerling (2 inch)	12,090	
1990	walleye	lg fingerling (7 inch)	3,220	
1990	muskellunge	lg fingerling (11 inch)	524	
1994	walleye	lg fingerling (5.4 inch)	10,010	
1995	muskellunge	fry	100,000	
1996	muskellunge	fry	100,000	
1996	walleye	lg fingerling (5.6 inch)	2,394	
1997	walleye	fingerling	5,951	
1998	walleye	sm fingerling (1.5 inch)	23,883	
1999	muskellunge	lg fingerling (11.8 inch)	297	
2000	walleye	sm fingerling (2.6 inch)	23,800	
2001	walleye	sm fingerling (1.6 inch)	11,900	
2002	walleye	sm fingerling (1.4 inch)	11,900	
2003	muskellunge	lg fingerling (12.5 inch)	235	MU Clubs Alliance
2004	walleye	sm fingerling (1.2 inch)	23,800	
2005	muskellunge	lg fingerling (11.5 inch)	238	MU Clubs Alliance
2006	walleye	lg fingerling (7.9 inch)	2,380	OTC marked
2007	muskellunge	lg fingerling (12 inch)	238	MU Clubs Alliance
2008	walleye	lg fingerling (7.1 & 6.7")	2,376	OTC marked
2010	muskellunge	lg fingerling (12 inch)	238	MU Clubs Alliance
2011	muskellunge	lg fingerling (10 inch)	238	MU Clubs Alliance
2012	walleye	lg fingerling (7.5 & 8")	180	OTC marked

Figure 2. Length-frequency of adult largemouth bass during 2012 in Julia Lake, Oneida County Wisconsin.

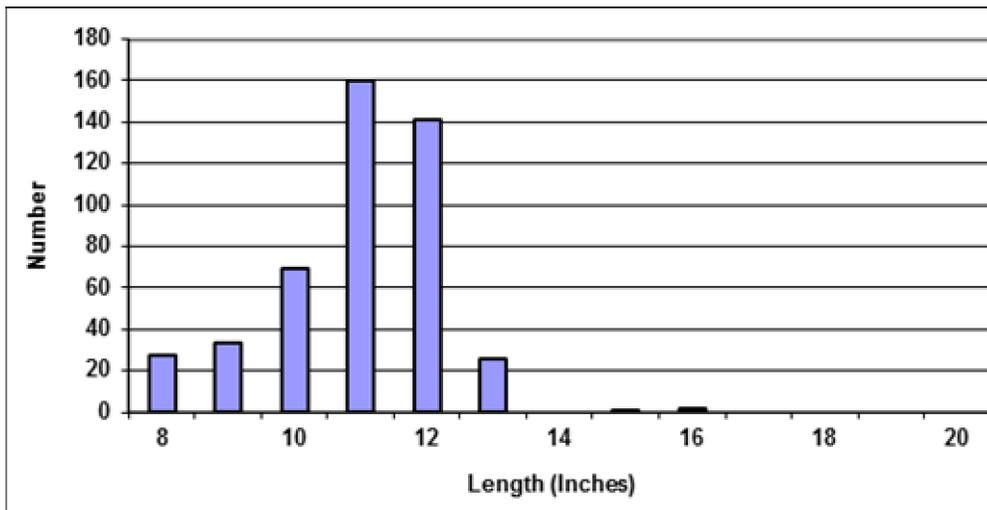
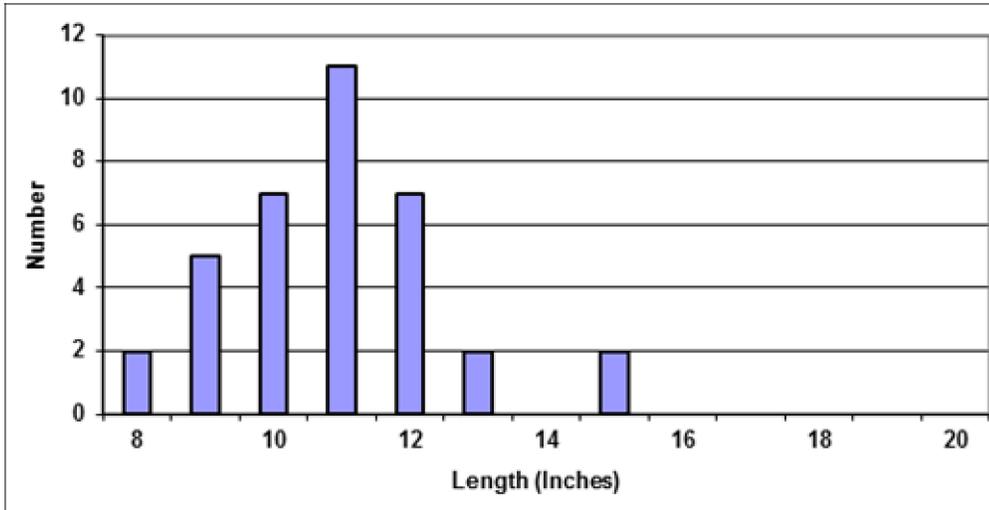


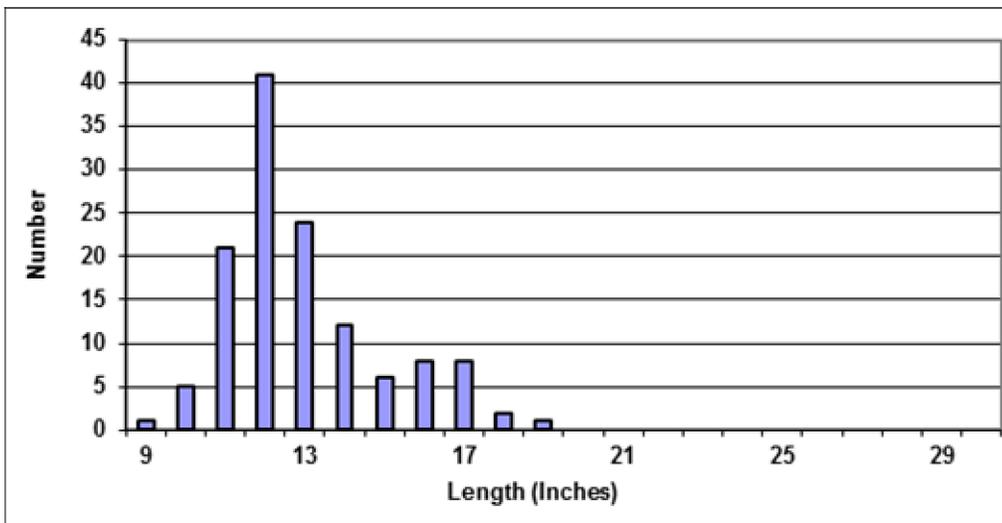
Figure 3. Length-frequency of adult smallmouth bass during 2012 in Julia Lake, Oneida County WI.



Northern Pike

We captured 129 northern pike (including 3 immature fish less than 12 inches in length). No pike were recaptured, suggesting that we only handled a small fraction of the population. Average size of northern pike was only 12.9 inches. No pike reached 20 inches and only 3 fish were 18 inches or larger (Figure 4). Only ages 2, 3 and 4 were found and growth was slow.

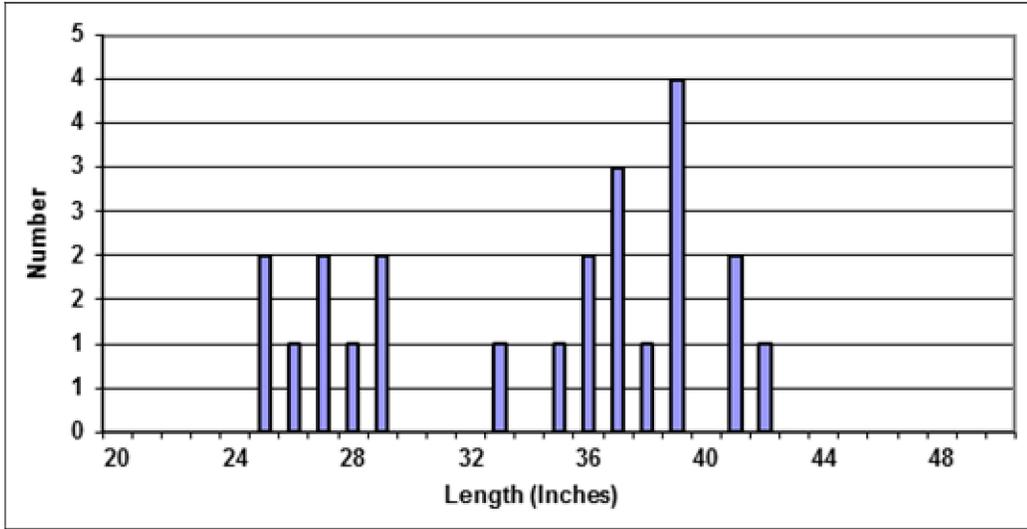
Figure 4. Length-frequency of northern pike during 2012 in Julia Lake, Oneida County Wisconsin.



Muskellunge

We captured 49 muskellunge during the survey, consisting of 20 mature and 29 immature fish (including 5 recaptures of immature fish). Muskellunge spawn later than walleye and northern pike, but we were unable to perform targeted netting due to other lake surveys. Adult muskellunge ranged from 25 to 42.5 inches in length (Figure 5). Muskellunge are being stocked in odd-numbered years by Muskie Clubs Alliance of Wisconsin. Fish were unavailable in 2009, so the 2009 quota was stocked in 2010, followed by the regular 2011 quota. The recent stocking explains why 25 of 29 juvenile fish were less than 18 inches in length.

Figure 5. Length-frequency of adult muskellunge during 2012 in Julia Lake, Oneida County WI.



Panfish

Our June panfish catch was low to moderate despite moderate depth and fairly extensive beds of aquatic vegetation in Julia. Panfish size was excellent and growth rates were near average at least through age 5. A heavy infestation of black spot parasite was most pronounced in the bluegill and may be providing some relief from angler harvest. Rock bass catches were high and bluegill catches low to moderate in both netting periods, while early spawners like yellow perch and black crappie were most abundant during walleye netting (Table 1). We found relatively low numbers of pumpkinseed, bluegill x pumpkinseed hybrids and yellow bullhead.

Panfish showed excellent size. Average bluegill length was 6.9 inches, 54% were over 7 inches and 25% were over 8 inches (Figure 6). Pumpkinseed averaged 6.6 inches, and 42% were over 7 inches (Figure 7). Rock bass were mostly 6-8 inches in length (Figure 9). Black crappie showed an upper size of 11.9 inches, with good numbers represented from 6 to 11 inches (Figure 10). Yellow perch were broadly distributed from 5.5 to 9 inches, with a few fish out to 10.9 inches (Figure 11).

Bluegill length-at-age was consistently about 0.5 inch below the regional average, while rock bass averaged about an inch behind average. Pumpkinseed were growing above average. Black crappie lengths were ahead of average through age 4, about average at age 5 (9.9 inches) and below average at older ages. Yellow perch lengths were about 1/4 to 1/2 inch behind average through age 6 (8.6 inches), but showed stagnant growth at older ages (Appendix A).

Figure 6. Length-frequency of bluegill during 2012 in Julia Lake, Oneida County Wisconsin.

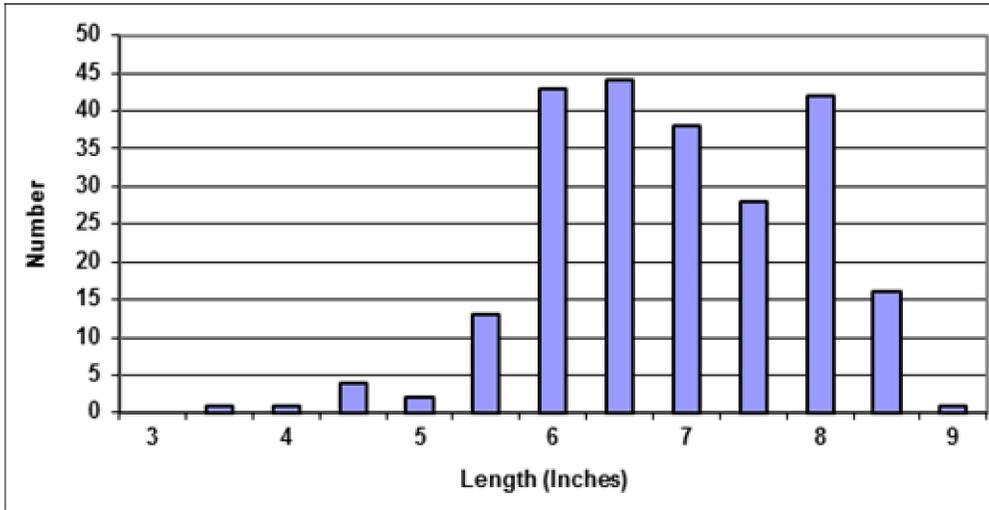


Figure 7. Length-frequency of pumpkinseed during 2012 in Julia Lake, Oneida County WI.

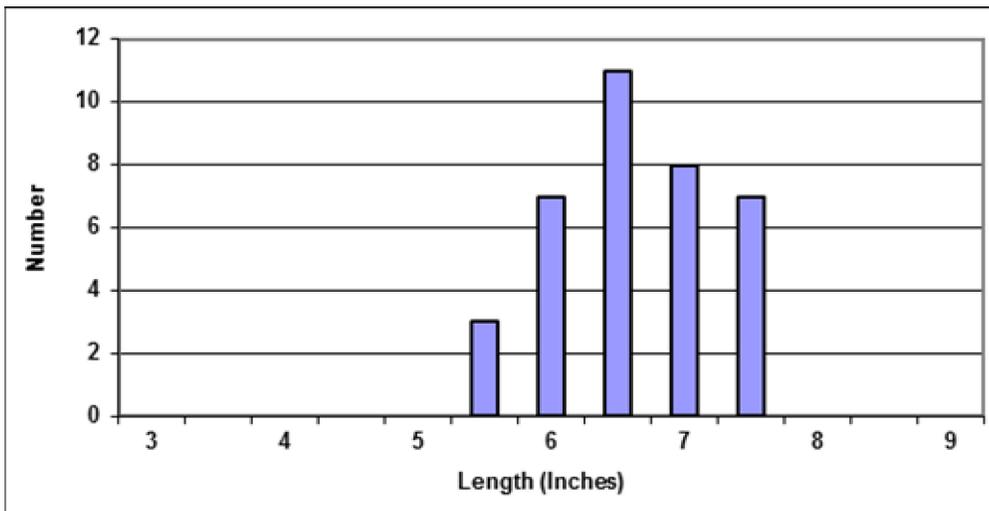


Figure 8. Length-frequency of bluegill x pumpkinseed hybrids during 2012 in Julia Lake, Oneida County WI.

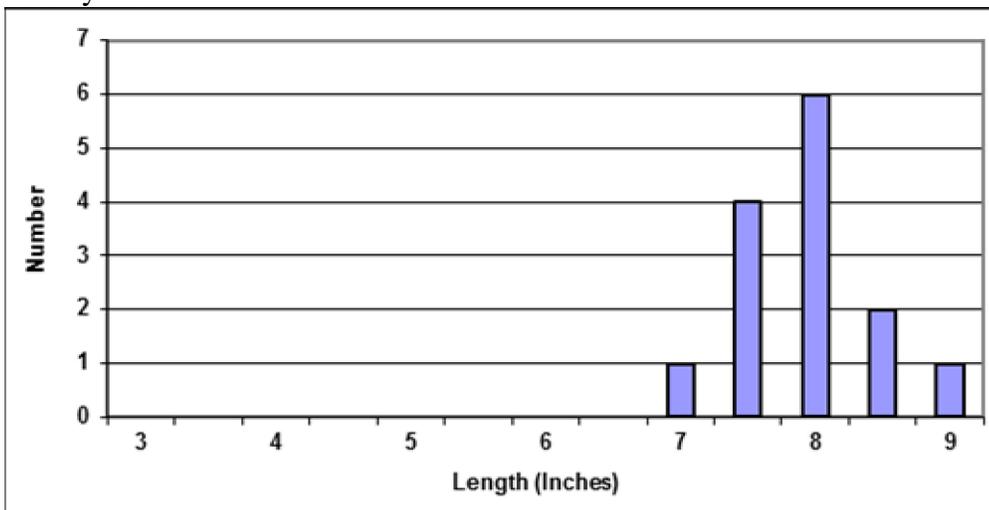


Figure 9. Length-frequency of rock bass during 2012 in Julia Lake, Oneida County WI.

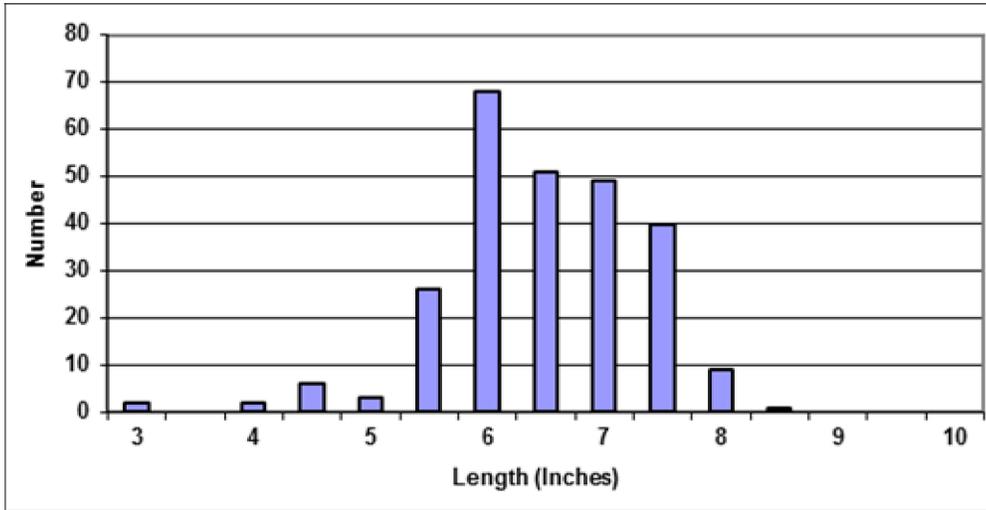


Figure 10. Length-frequency of black crappie during 2012 in Julia Lake, Oneida County WI.

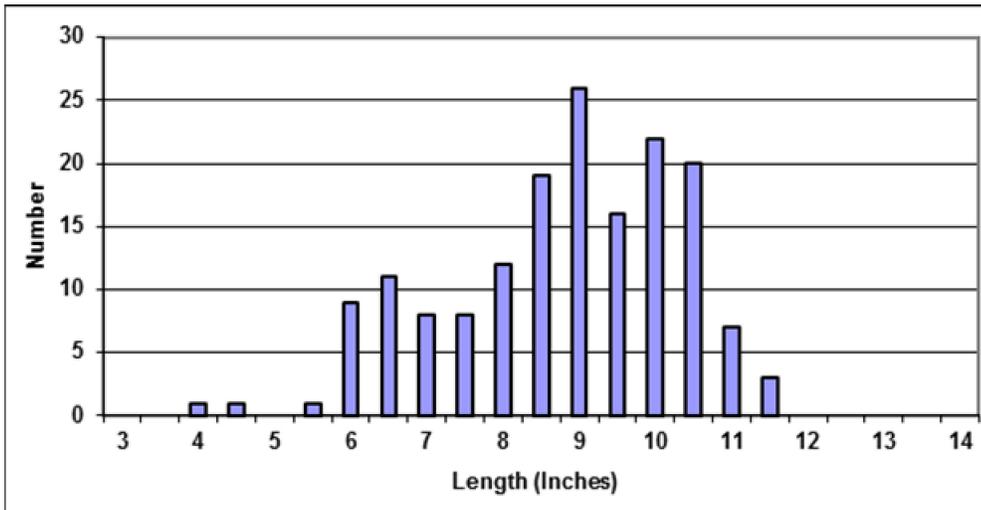
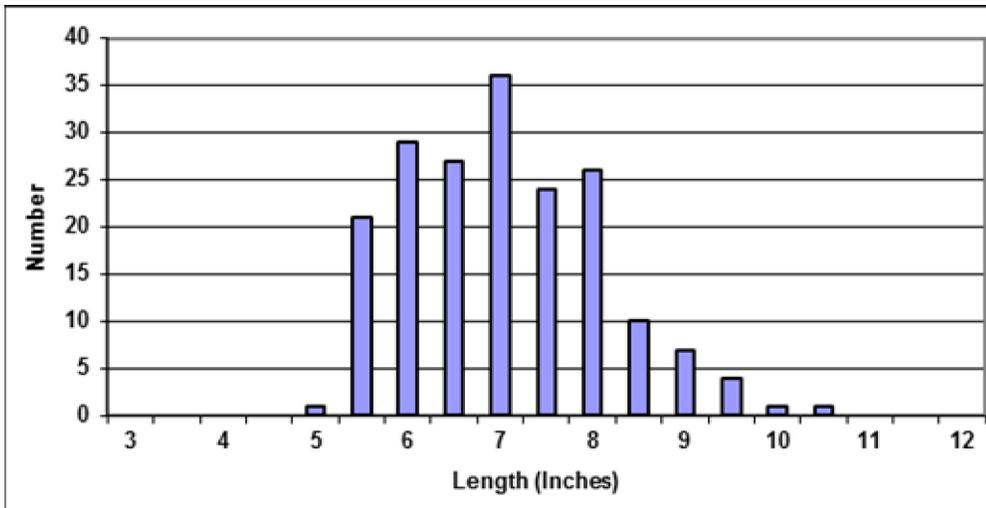


Figure 11. Length-frequency of yellow perch during 2012 in Julia Lake, Oneida County WI.



MANAGEMENT RECOMMENDATIONS

Julia Lake supports a diverse fishery. Largemouth bass and northern pike are the dominant gamefish, with good numbers of walleye and muskellunge and low numbers of smallmouth bass also present. Muskellunge size was centered on 39 inches, but size of other game species was generally small, and appeared to reflect very strong recent recruitment. Panfish were found in low to moderate abundance, with the catch dominated by rock bass and bluegill. We found moderate catches of yellow perch and black crappie and low numbers of pumpkinseed, bluegill x pumpkinseed hybrids and yellow bullhead. We found excellent panfish size, with 54% of bluegill and 42% of pumpkinseed at least 7 inches, 26% of perch at least 8 inches and 58% of black crappie 9 inches or larger. It appears that high predator abundance is keeping panfish in check and promoting good growth rates among smaller, younger individuals, but bluegill, crappie and perch growth slowed after about age 5. Forage and non-game species include golden shiner and white sucker. Julia is managed as a mixed fishery with abundant predators and quality panfish size. Muskie stocking is producing a fairly high-density population with good size potential. Recent large fingerling walleye stocking and some limited natural recruitment has created a moderate-density population that will require additional stocking if it is to be maintained. A rule change to exempt largemouth bass from minimum length limits may reduce stockpiling of largemouth bass under 13 inches. However, panfish quality may suffer if predator abundance declines.

ACKNOWLEDGEMENTS

Steve Timler and I performed the field work for this survey with assistance from Jeff Blonski, Aaron Nelson and Tim Tobias. Timler assigned gamefish ages and Mike Coshun calculated the walleye and bass population estimates.

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Cover image courtesy of Oneida County website. www.co.oneida.wi.gov

APPENDIX A FISH AGE RESULTS

An age-length key was created from the aged subsample and applied against the full length-frequency to estimate averages.

Table A.1. Male walleye length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
3	2	11.9	11.9
4	27	13.2	13.3
5	4	14.3	14.2
6			15.6

Table A.2. Female walleye length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
3			13.3
4	18	15.1	15.0
5	17	15.6	16.2
6	1	16.8	17.8

Table A.3. Largemouth bass length at age in Julia Lake, Oneida County Wisconsin during 2012 and 2009.

Age	2012 number of fish	2012 avg. length	2009 number of fish	2009 avg. length	North. WI avg.
1					3.5
2			6	7.0	6.6
3	16	8.2	14	8.9	8.9
4	15	10.4	24	10.4	10.5
5	10	11.5	11	11.7	12.1
6	10	12.4	3	11.2	13.6
7	8	12.5	1	12.3	14.9
8	3	12.5			15.8
9					16.2
10	1	16.3			17.1
11					17.8
12					18.2

Table A.4. Smallmouth bass length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
1	1	4.3	3.5
2	6	7.5	6.9
3	8	9.8	9.3
4	11	11.4	11.8
5	7	12.4	13.5
6	2	13.3	15.2
7	1	15.3	16.1
8			17.1
9			17.7
10			18.3
11			18.5
12			19.8

Table A.5. Male northern pike length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
2	16	12.1	13.4
3	24	13.5	16.2
4	6	14.1	18.9

Table A.6. Female northern pike length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
2	19	12.8	
3	12	15.1	16.9
4	3	15.0	20.4

Table A.7. Male muskellunge length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
5	1	27.9	29.2
6	2	27.3	31.5
7	1	38.9	33.3
8			34.4
9	3	39.3	35.8
10	3	34.9	37.3
11			37.9

Table A.9. Bluegill length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
3	1	3.6	5.0
4	12	5.7	6.2
5	24	6.6	6.8
6	16	7.2	7.8
7	5	7.2	8.2
8	6	8.2	8.7
9	9	8.2	8.7
10	2	8.7	9.2
11	4	8.6	

Table A.11. Hybrid bluegill x pumpkinseed length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length
3		
4		
5	2	6.4
6	1	8.1
7	5	8.3
8	5	8.0
9	1	9.0

Table A.8. Female muskellunge length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
5			31.9
6			33.7
7	2	31.2	35.8
8	2	36.1	38.1
9			39.5
10	3	38.6	41.0
11	2	41.8	43.2

Table A.10. Pumpkinseed length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
3			4.8
4	3	6.4	5.7
5	16	6.6	6.5
6	8	7.0	6.8
7	4	7.7	7.3
8	3	7.1	7.3

Table A.12. Rock bass length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
3	2	3.3	5.1
4	11	5.5	6.4
5	29	6.4	7.2
6	13	7.0	7.9
7	12	7.8	8.4
8	4	8.3	9.0
9	1	8.2	9.4
10	1	8.1	

Table A.13. Black crappie length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
2	14	6.8	5.3
3	25	8.6	7.1
4	9	9.8	9.0
5	7	9.9	10.0
6	6	10.3	10.7
7	10	10.7	11.6
8	6	10.6	11.7
9	1	11.3	10.4
10			11.6

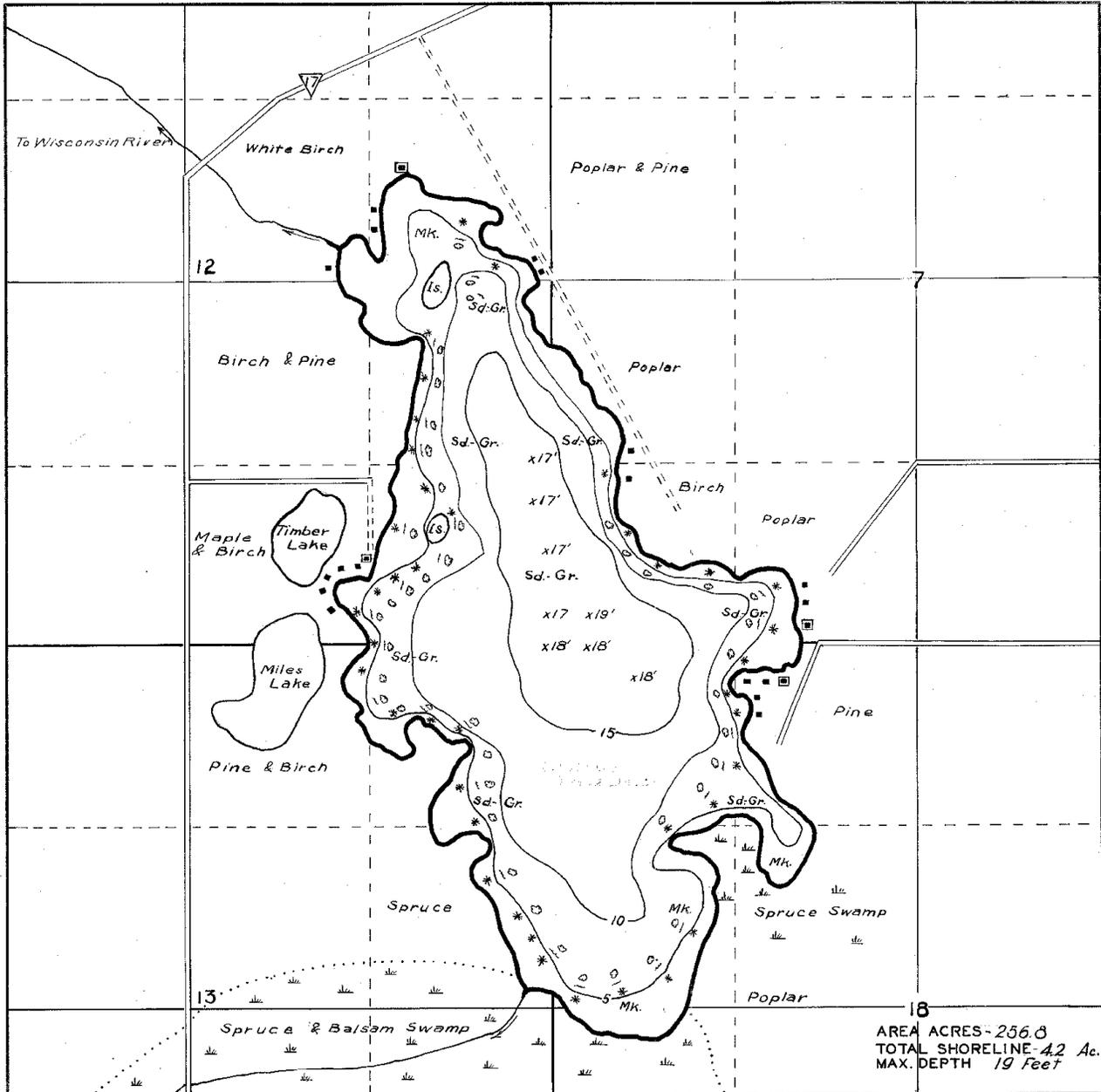
Table A.14. Yellow perch length at age in Julia Lake, Oneida County Wisconsin during 2012.

Age	Number of fish	avg. length	Northern WI avg.
2			4.6
3	4	5.7	6.0
4	31	6.6	6.9
5	25	7.5	7.9
6	9	8.6	9.0
7	9	8.7	9.9
8	11	8.7	10.8
9	3	8.6	12.1
10			

LAKE SURVEY MAP

WISCONSIN CONSERVATION DEPARTMENT
 BIOLOGY DIVISION
 LAKE AND STREAM IMPROVEMENT SECTION

LAKE JULIA
 SECTION 12, 7, 13, 18
 TOWNSHIP 36 N
 RANGE 8-9 E
 TOWN OF CRESCENT-PELICAN
 COUNTY ONEIDA



AREA ACRES - 256.8
 TOTAL SHORELINE - 4.2 Ac.
 MAX. DEPTH 19 Feet

DATE July 29, 1939
 COMPILED BY
 TRACED BY L. E. K.
 SOURCE OF INFORMATION
W.P.A. Lake Improvement Project
 SOUNDINGS WPA Lake Survey
 DATES OF MAP REVISION
 WORK AGENCY W. P. A.

R 8 E R 9 E LAKE IMPROVEMENT RECORD

TYPE	DATE	1937
○ BRUSH REFUGES		45
~ SAPLING TANGLES		291
□ SPAWNING BOXES		
* MINNOW SPAWNERS		417
TOTAL		751

SCALE 8 inches = 1 mile

- LEGEND
- WEED BEDS
 - ROCKY SHOALS
 - Sd SAND
 - Cl CLAY
 - Gr GRAVEL
 - Mk MUCK
 - DWELLING
 - ABANDONED DWELLING
 - RESORT