

DATE: January 28, 1998

FILE REF: 3600

TO: Randy Schumacher

FROM: Sue Beyler *AB*

SUBJECT: Spring, 1997 electrofishing survey on Lower Phantom Lake (WBIC 0765800)

SUMMARY

We found largemouth bass to be moderately abundant in Lower Phantom Lake during a May, 1997 electrofishing survey. Largemouth were robust and did not appear to be stunted. PSD shows neither excessive nor inadequate recruitment from stock to quality size. However, the RSD-15 and length frequency data suggest that mortality of legal-sized bass is high.

Bluegill PSD and catch rates showed an excess of young bluegills and high mortality of bluegills over 6 inches in length. Comparison of the bluegill catch rate to catch rates and population estimate of bluegills in Oconomowoc Lake resulted in an estimate of 91,000 bluegills in Lower Phantom. We concluded that a surplus of young bluegills existed in Lower Phantom which could safely be removed for field transfer without negatively impacting the population.

Subsequent to this determination, we removed 20,130 bluegills by fyke net over a 1 week period and transferred them to Big Muskego Lake. Bluegills were sorted out of the nets, and no bluegills 6 inches or longer were taken.

METHODS

We electrofished 2.2 miles of shoreline of 433 acre Lower Phantom Lake on May 21, 1997. The purpose of the survey was to evaluate bass and bluegill abundance and population structure. Lower Phantom was one of several lakes in the Illinois-Fox River watershed being considered for field transfer of bluegills into Big Muskego Lake. Therefore, we needed to determine if Lower Phantom had "surplus" bluegills which could be removed without adversely impacting the population.

Electrofishing began at dark. We sampled two 0.5 mile timed run stations, where we attempt to capture all fish. We collected gamefish only (bass, northern pike and walleye) for an additional 1.2 miles (Figure 1). All fish were identified and measured to the nearest tenth-inch in length.

Sampling conditions were very good, with light SW wind and generally clear water. Water temperature was 61°F.

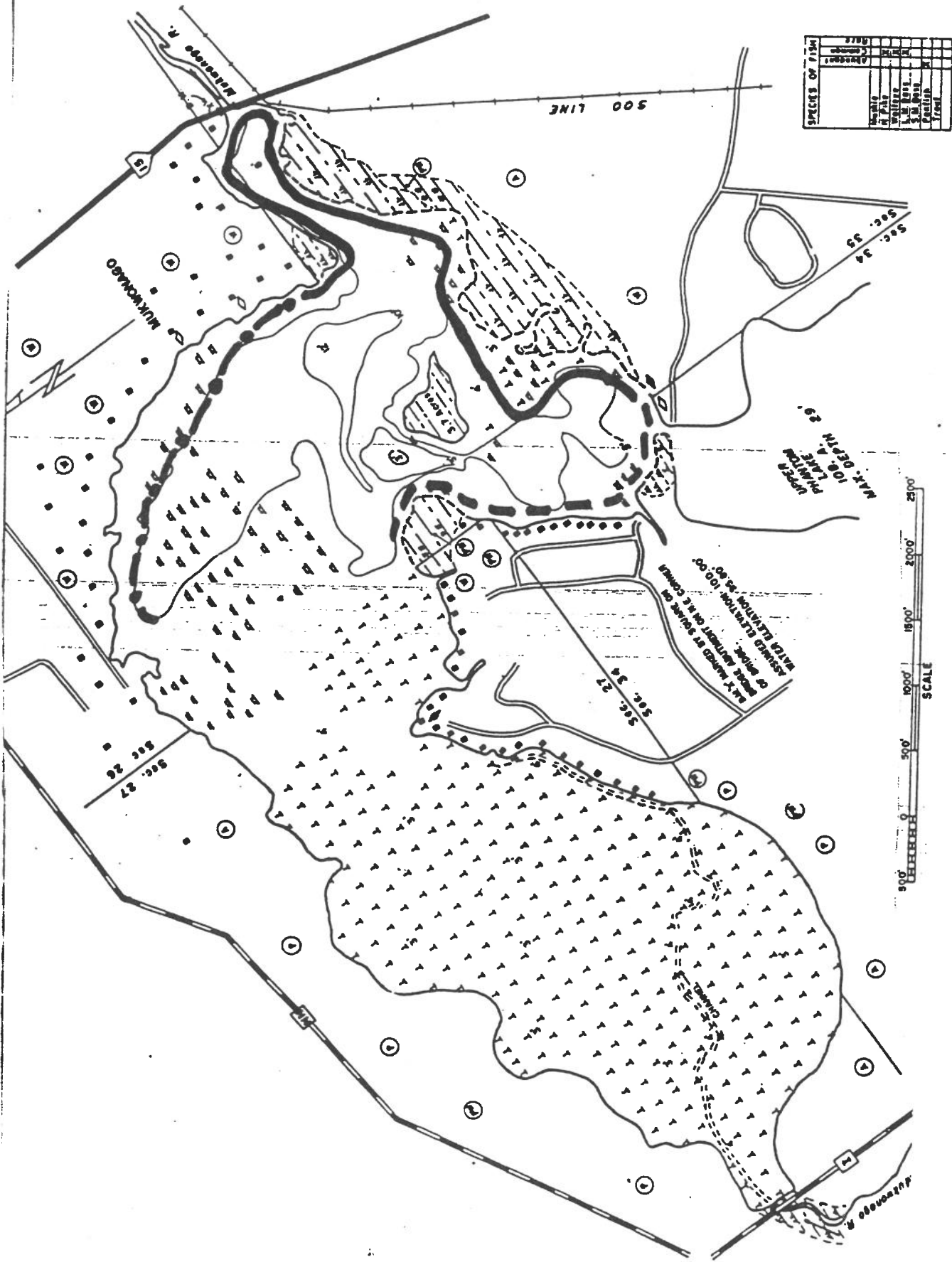


Figure 1. Lake survey map of Lower Phantom Lake, indicating the May 21, 1997 electrofishing stations. Timed run 1 (0.5 miles) ——— ; gamefish (1.2 mi.) ●

RESULTS

Timed Run Stations

We captured 16 species of fish in our two timed run stations. Largemouth bass was the predominant gamefish species, and bluegill was the predominant panfish species in both stations. More largemouth were captured in station 1 (Table 1). More fish, primarily bluegills, were captured in station 2 (Table 2).

Table 1. Fish captured from timed run station 1 of Lower Phantom Lake, May 21, 1997. Survey length = 0.5 mile; shocking time = 0.33 hour.

Species	Number	Catch/Mile	Mean Length	Std. Dev.
Largemouth Bass	30	60	9.4	1.79
Northern Pike	1	2	20.2	-
Bluegill	47	94	4.7	1.05
Yellow Perch	30	60	5.6	0.87
Warmouth	17	34	5.1	1.39
Pumpkinseed	3	6	5.9	0.34
Black Crappie	1	2	6.6	-
Lake Chubsucker	13	26	6.4	0.83
Yellow Bullhead	2	4	11.7	0.30
Brown Bullhead	1	2	12.3	-
Bowfin	2	4	14.3	0.25
White Sucker	4	8	14.7	2.68
Golden Shiner	7	14	4.4	0.35
Carp	2	4	26.0	2.00
Total	160	320		

Table 2. Fish captured from timed run station 2 of Lower Phantom Lake, May 21, 1997. Survey length = 0.5 mile; shocking time = 0.33 hour.

Species	Number	Catch/Mile	Mean Length	Std. Dev.
Largemouth Bass	13	26	11.3	2.60
Bluegill	103	206	4.8	1.08
Yellow Perch	41	82	5.2	0.75
Warmouth	3	6	5.8	1.22
Pumpkinseed	11	22	6.0	0.24
Lake Chubsucker	11	22	7.4	0.58
Yellow Bullhead	1	2	8.8	-
Brown Bullhead	4	8	11.9	0.45
Bowfin	5	10	21.1	5.21
Golden Shiner	9	18	5.3	0.87
Emerald Shiner	2	4	3.4	0.25
Longnose Gar	1	2	16.3	-
Carp	4	8	24.8	4.56
Total	208	416		

Our overall catch rate for bluegills from the two stations, combined, was 150 per mile. Mean length of bluegills from the combined sample was 4.7 inches. The length frequency showed a strong peak at 4 to 5 inches (Figure 2). Proportional stock density (PSD), using a stock size of 3 inches and a quality size of 6 inches, was 12.4 percent. Relative stock density with a quality length of 8 inches (RSD-8) was 2.1 percent. Anderson (1980) recommended a target PSD range of 20 to 60 percent, and RSD-8 range of 5 to 20 percent.

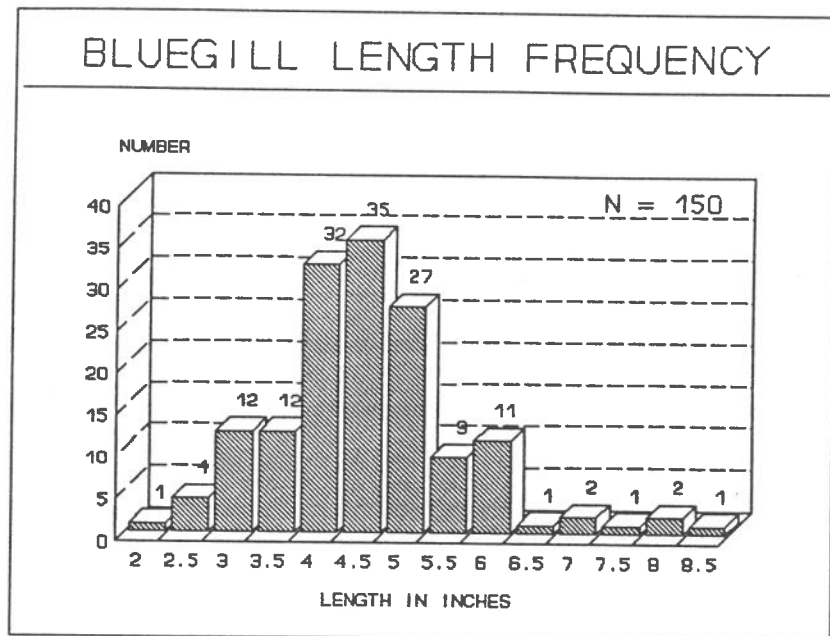


Figure 2. Length frequency for bluegills from the two timed run stations of Lower Phantom Lake, May 21, 1997.

To estimate the number of bluegills in Lower Phantom, I used the catch rate and compared it to the catch rate and population estimate of bluegills from the 1994 Oconomowoc Lake comprehensive survey. Based on a catch rate of 10 per mile and a population of 6,060 in Oconomowoc Lake, I estimated the Lower Phantom Lake bluegill population at 91,000. This estimate probably does not accurately reflect the number of bluegills 3 inches and smaller. Younger fish are generally underrepresented in our samples due to gear limitations.

Second in abundance in the timed runs were yellow perch. In our combined stations we captured 71 perch averaging 5.4 inches in length. Peaks in the length frequency occur at 4.5 and 6 inches (Figure 3). Our largest perch was 7.8 inches long.

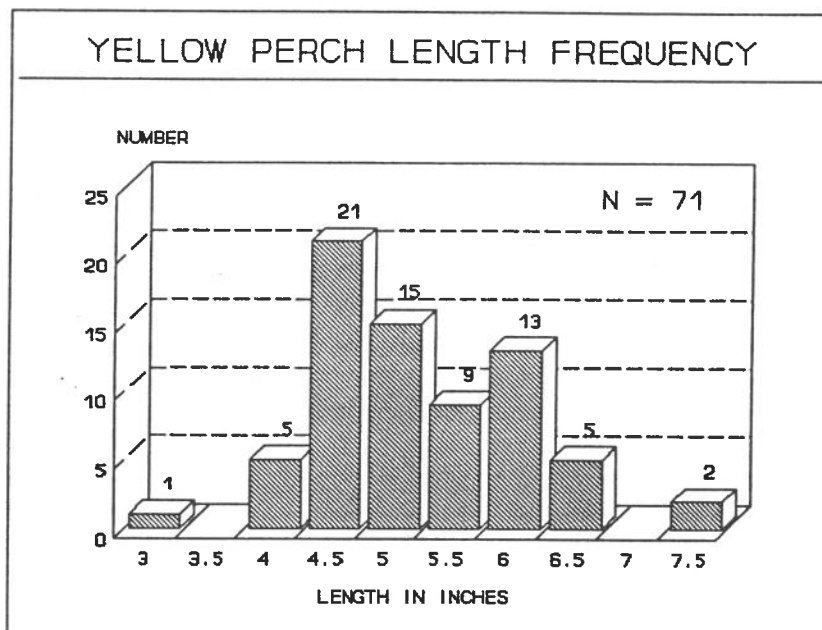


Figure 3. Length frequency for yellow perch from the two timed run stations on Lower Phantom Lake, May 21, 1997.

Twenty-four lake chubsuckers were caught in the two timed run stations. The peak in the length frequency was at 7 inches (Figure 4). Lake chubsuckers, a Wisconsin "watch" species, thrive in quiet water with emergent vegetation. Lower Phantom offers abundant habitat for them.

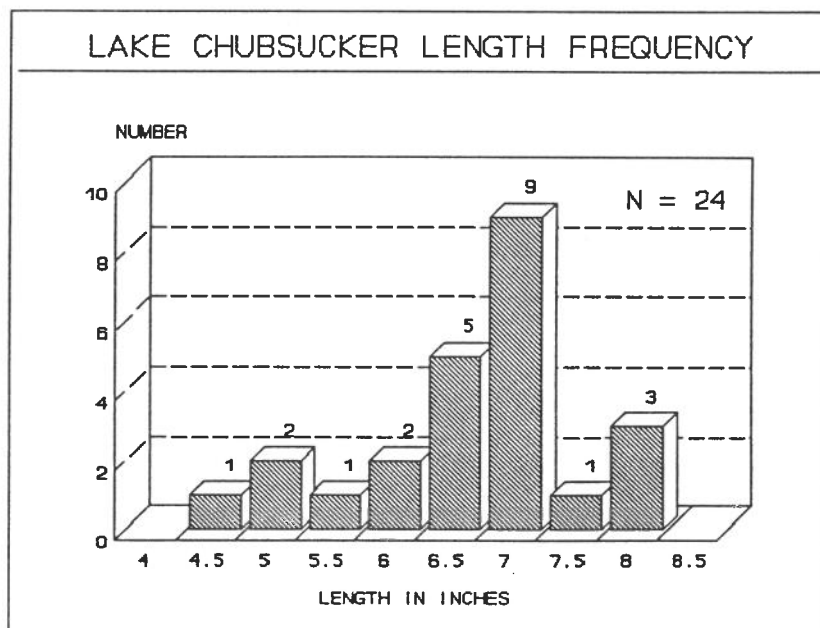


Figure 4. Length frequency for lake chubsuckers from Lower Phantom Lake, May 21, 1997.

Gamefish-only Station

We caught an additional 45 largemouth bass and 2 northern pike in our 1.2 mile gamefish-only station (Table 3).

Table 3. Fish captured from the gamefish-only station of Lower Phantom Lake on May 21, 1997. Survey length = 1.2 miles; shocking time = 0.73 hour.

Species	Number	Catch/Mile	Mean Length	Std. Dev.
Largemouth Bass	45	37.5	11.3	2.70
Northern Pike	2	1.7	15.2	4.80

The length frequency for the 88 largemouth bass captured from all three stations combined had a modal peak at 9 inches and a smaller peak at 13 inches (Figure 5). The length frequency showed adequate quality-size bass (over 12 inches), but numbers dropped off sharply when bass reached the 14 inch size limit.

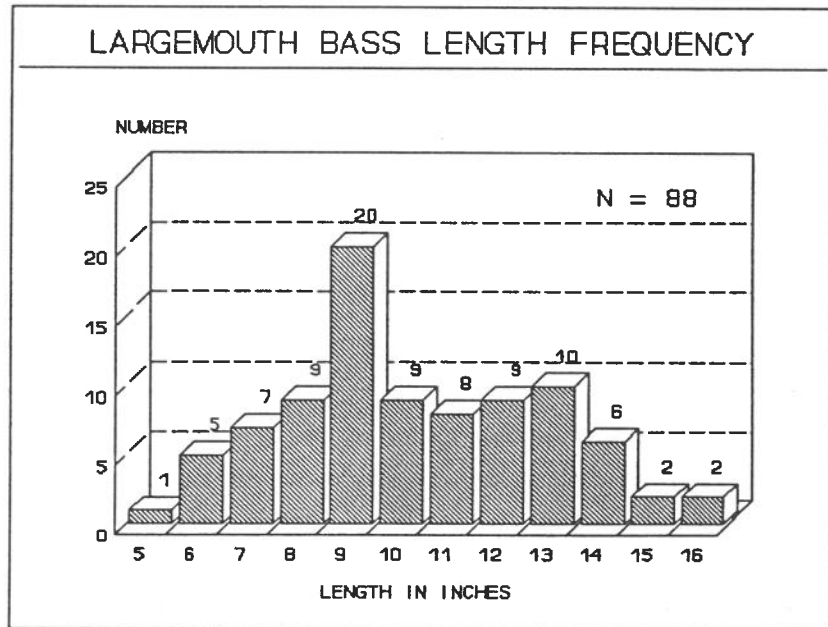


Figure 5. Length frequency for largemouth bass captured on May 21, 1997 from all stations, combined.

Proportional stock density, using a stock length of 8 inches and a quality length of 12 inches, was 39 percent. Relative stock density with a quality length of 15 inches was 5 percent. At 39 percent, PSD is very nearly in the target range of 40 to 70 percent proposed by Anderson (1980). However, RSD-15 was well below Anderson's 15 to 25 percent target.

We captured only 2 northern pike in the gamefish run. They measured 10.4 and 20.0 inches in length.

DISCUSSION

Bluegill PSD and RSD-8 were well below target ranges. A combination of excessive reproduction and high mortality of quality-size bluegills is likely. At 210 per acre, bluegill density is high. Lower Phantom has abundant habitat in which young bluegills can hide from predation. It is also a very popular fishing lake, especially ice fishing.

With the low PSD of the bluegill population we expected to see either too few bass, or poor size structure in the bass population. However, bass PSD showed a fairly good balance between stock size and quality size fish, with neither excessive nor inadequate reproduction. Bass catch rate was moderate to high. The length frequency and low RSD-15 for largemouth indicated high mortality of legal sized bass.

Northern pike catch was very low. Northerns are notoriously easy to catch through the ice, and we would expect them to make up the bulk of the winter gamefish catch on Lower Phantom with its abundance of marsh habitat. Local conservation wardens report that, until recently, they often found the ice littered with fingerling northern pike. Probably thought to be grass pickerel, anglers referred to these fish as "forells," and perceived them as a pest.

Management recommendations, based on this survey, include:

1. Stock northern pike fingerlings at a rate of 5 per acre to supplement what appears to be a low-density population. Follow-up with spring fyke netting, when workload permits, to assess population density and stocking impact.
2. Proceed with plans to field transfer some bluegills out of Lower Phantom for restocking into Big Muskego Lake. Up to 20 percent of the bluegills could be removed without negatively impacting the population. Fish will be sorted, and no bluegills measuring 6 inches or larger will be taken.

Subsequent to this survey, 20,130 panfish were field transferred over a 4 day period ending June 27, 1997. A private purchase by the lake association provided 900 14-inch northern pike stocked in late September. In addition, 40,000 walleye fingerlings were stocked in Lower Phantom and 68,490 were stocked in Upper Phantom in late summer, 1997.