



STRAWBERRY LAKE, LIVINGSTON COUNTY

Fisheries Survey
May 24 – June 28, 2004

Lake Description:

Strawberry Lake is a 257 acre natural lake located in Hamburg Township in southern Livingston County between the cities of Ann Arbor and Brighton. It is at the most upstream end of a series of lakes along the Huron River that is known as the Portage Chain-of-Lakes. The Huron River enters on the northeast shore and exits on the southwest flowing toward Gallagher Lake. Zukey Lake is accessible via a canal on the northwest side of Strawberry Lake. Public access to Strawberry Lake is via a private marina on Zukey Lake or from the public boat launch located on Big Portage Lake at the far end of the lake chain.

The lake is characterized as having an irregular shoreline with limited shoal area and steep contour changes. Approximately 75% of the lake is 20 feet or deeper. There are two large main lake basins with maximum depths of approximately 40 feet (western basin) and 50 feet (eastern basin). Most of the shoreline, other than small stretches of wetland, is developed as residential housing.

Limnological sampling conducted in August of 2004 found a thermocline set up at around 22 feet of depth with water temperatures ranging from 71⁰F at the surface to 67⁰F at the thermocline and then dropping quickly to 53⁰F at 31 feet and then to 50⁰F the rest of the way to the bottom at 46 feet. Dissolved oxygen levels ranged from 11.5ppm at the surface down to 4.5ppm at 22 feet and then dropping quickly to less than 1ppm from below 25 feet to the bottom. Alkalinity, chlorophyll a, and nutrient levels (see Limnological report) show Strawberry Lake is moderately productive with nothing unusual compared to other area lakes.

History:

Although Strawberry Lake has not been stocked directly, walleye historically stocked in other lakes in this Huron River chain of lakes have access to the lake and are the probable source of walleye caught during this survey. Big Portage Lake at the far end of the chain has been stocked with walleye since the early 1980's and regularly since the mid-1990s. Baseline Lake also received several walleye stockings in the 1990s and Zukey Lake (directly connected to Strawberry Lake) has been stocked several times as well (1985, 1988, 2001 and 2004). The first stocking of channel catfish into the lake chain took place in the fall of 2004 (Big Portage–3,000 fish and Zukey–1200 fish) and these will likely soon show up in Strawberry Lake as well.

The lake's fish population was surveyed previously in 1985 and 1995. Strawberry Lake has historically had good fisheries for bluegill, black crappie, and largemouth bass. Larger-than-average bluegills have regularly been reported by anglers and both of the earlier surveys found fish over 9 inches. A few small walleye started showing up in the 1985 survey and adults were found in 1995. Anglers also have reported sporadic catches of walleye over the past several years.

Survey Description:

This lake was sampled as part of the statewide, random lakes, Status & Trend Program. Sampling gear used for this survey included 2 standard inland trap nets, 2 large-mesh fyke nets, 1 experimental gill net, a boom shocker, and a 25-foot seine. During May 24-27, 2004, the trap and fyke nets were each set for three nights while the gill net was only set for two nights. Three seine hauls were conducted on June 14, 2004, and three 10-minute electroshocking stations were sampled during the night of June 28, 2004. Limnological samples were collected and a temperature and dissolved oxygen profile of the lake's main basin were obtained in Mid-August of 2004 when the lake had stratified.



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Fish Analysis:

General

A total of 1,121 fish weighing over 1,277 pounds and comprised of 32 different species were captured during this survey. Panfish species such as black crappie, bluegill, green sunfish, pumpkinseed sunfish, rock bass, redear sunfish, and yellow perch made up 45% of the total catch by number (67% by number if forage species are not counted) and 7% of the catch by weight. Larger gamefish including largemouth bass, northern pike, smallmouth bass and walleye made up 5.5% of the total catch by number (with forage fish removed) and 4% by weight. Rough fish such as bowfin, carp, white sucker, redhorse sucker, longnose gar and northern hog sucker comprised 25% of the total catch by number (with forage fish removed) and the largest portion of the total catch by weight at 89%. The 11 small forage species collected (359 fish total) were mostly blacknose shiner, logperch, and sand shiner, with small numbers of the other species (see "Catch by Species – All Efforts" report for complete list of fish species). A few brown bullhead and yellow bullhead were captured as well as some common map and spiny softshell turtles.

Panfish

Bluegill were by far the most abundant panfish caught in this survey. They comprised over 56% of the total survey catch by number (leaving out forage fish) and 6% by weight. Over 83% of bluegills from the trap and fyke net catch exceeded the minimum size acceptable to anglers (6 inches) with an average length of 7.0 inches and 11 individuals exceeding 9 inches. Growth rates based on length-at-age information from scale samples were very good with a mean growth index 0.8 inches over the state average. Previous surveys in 1985 and 1995 found slightly larger average lengths (7.3 and 8.0 inches respectively), a higher percentage of 6-inch fish (96% of trapnet catch for both surveys), and similarly better than average growth rates. Trapnet catch-per-effort was slightly below 1995 and significantly below the 1985 catch rate (16 vs.19 vs.30).

The quality of the bluegill population in Strawberry Lake was also evaluated using Schneider's Index. This index provides a ranking system that describes the quality of a bluegill population in a lake using a scale of 1 to 7 primarily based on the percent of bluegills in the trapnet catch in the 6, 7, and 8-inch size ranges (Schneider 1990). The index calculated for Strawberry Lake based on this survey is 5.4 which corresponds to a "good-excellent" rating. This is slightly below the index of 6.4 (excellent-superior) calculated from the 1985 and 1995 surveys.

Rock bass and **yellow perch** were the only other panfish caught in significant numbers in this survey comprising just over 5% and 3%, respectively, of the total catch by number with forage fish removed. The rock bass ranged from 3 to over 8 inches with an average length of 6.0 inches while the yellow perch ranged from 1 to 6 inches in length.

Other panfish collected included 7 **black crappie** (largest at 9 inches), 4 **redear sunfish** (8-9 inches), 3 **green sunfish** (1-3 inches), and 2 **pumpkinseed sunfish** (4-6 inches). The black crappie catch was significantly less than previous surveys with only 3 caught in 6 trapnet lifts this survey vs. 21 fish in 4 net lifts in 1995 and 50 fish in 4 net lifts in 1985. This was also the first time redear sunfish have been found in the Portage chain of lakes. While there are no records of them ever having been stocked in the chain, they have been stocked elsewhere in the Huron system (Bruin Lake and Halfmoon Lake) and some have apparently made their way into the Portage chain.



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Large Gamefish

Largemouth and **smallmouth bass** were the large gamefish found in highest abundance during this survey. Together they totaled 4% of the total catch by number (with forage species removed) and 1% by weight with about equal numbers of each. Only one of each species caught in the survey exceeded the minimum legal size limit of 14 inches, but angling reports indicate there are plenty of legal-sized bass present in the lake. The minimal growth data available from this survey indicated the largemouth bass were growing above state average (mean growth index of +1.0) while smallmouth bass growth was about equal to the state average.

Small numbers of **walleye** and **northern pike** were also collected during this survey. The total of 7 walleye (all over the minimum legal size limit of 15 inches) and 5 northern pike (4 over the minimum legal size limit of 24 inches) accounted for almost 3% of the total catch by weight. Fisheries Division has been stocking walleye fingerlings for several years in the lake chain (see History section) and a small population appears to be present in this lake. Sporadic angling reports also indicate a limited walleye fishery is present.

Rough Fish

The numbers and weight of large, non-game fish species (commonly referred to as rough fish) collected during this survey indicates they comprise a major portion of the fish biomass in the lake. **Common carp** made up 15% of the total catch by number (114 fish) and 80% by weight. **Golden redhorse** and **longnose gar** (4% and 3.5% of the total catch by number) made up another 6% of the total weight caught. Other large, non-game fish species collected included 7 **common white sucker**, 5 **northern hog sucker**, and 3 **bowfin** for a total of 89% of the total fish weight collected during this survey.

Forage Fish

The smaller fish species collected in this survey (359 individuals) were comprised mainly of **blacknose shiner** (145 fish), **logperch** (100 fish), and **sand shiner** (65 fish). **Spotfin shiner** (17 fish) and **bluntnose minnow** (10 fish) were also common. Only a few individuals of several other forage fish species were collected. These included 1 **banded killifish**, 2 **brook silverside**, 2 **golden shiner**, 5 **johnny darter**, 7 **mimic shiner** and 5 **spottail shiner**.

Miscellaneous Species

Other fish species caught included **brown bullhead** (3 fish) and **yellow bullhead** (3 fish). Turtles collected included 8 **common map** turtles with shells 4-10 inches long and 8 **spiny softshell** turtles ranging from 6-13 inches carapace length.

Conclusions and Management Recommendations:

1. The quality of the bluegill fishery in Strawberry Lake is still very good to excellent with good growth rates and excellent numbers of larger individuals. It does appear to have declined slightly compared to the earlier surveys in terms of average size, numbers of large fish, and a lower quality index as described earlier in the panfish section.
2. Black crappie numbers have been declining steadily according to the survey history with trapnet CPEs dropping from 12.5 in 1985 down to 5 in 1995 and only 0.5 fish per net lift in this survey. Water temperatures were similar in all years (mid 60's to 70 °F) and the number of net lifts was also similar ranging from 4 to 6 trapnet lifts per survey. Reasons for the decline are unknown at this time.



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Conclusions and Management Recommendations (cont.):

3. Black bass (largemouth and smallmouth) growth remains better than most area lakes with lengths-at-age above the state average for both species. Bass catch rates are typically poor in net surveys with angler reports often a better indicator of legal-size fish abundance. Anglers report adequate numbers of legal bass from this lake and the Portage chain-of-lakes in general.
4. There is a good diversity and abundance of forage fish species present in the lake that reflects the diverse habitats present and the overall health of this lake's ecosystem. This diversity also helps support the relatively large number of predator species found here.
5. Walleye are present in fairly good numbers even though stockings have occurred only in connecting lakes. The recent initiation of walleye fingerling stocking directly into Strawberry Lake should help increase this population and enhance the fishery that has developed. Stocking walleye spring fingerlings into this lake on an every other year basis should continue to maintain the fishery.
6. Several of the non-game fish species found in this survey are more typical of riverine environments. Golden redbreast and northern hog sucker were two of those likely present mainly due to the influence of the Huron River which flows through this lake.
7. Channel catfish stocking into this system was initiated in the fall of 2004 just subsequent to this survey. The development of a fishery for this species and the potential impacts on the fish community should be monitored by resurveying this lake in 3-4 years.



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2004 FISHERIES SURVEY SAMPLING SITES

INSTITUTE FOR FISHERIES RESEARCH
 DIVISION OF FISHERIES MICHIGAN CONSERVATION DEPT.
 LAKE INVENTORY MAP
STRAWBERRY LAKE
 AREA 257 ACRES
 OUTLINE FROM AAA AERIAL ENLARGMENT 7/29/37 SOUNDINGS 1/24-25/39
 INVENTORY 7/13-15/39 T.I.N., R.5E., SEC. 27,28

LEGEND

- | | | |
|--------------|-------------------|------------------------|
| □ Sand | SHORE FEATURES | STATIONS |
| ▭ Muck | — Road | △ Temp, chem, plankton |
| VEGETATION | ■ Cottage | △ Plankton |
| T Floating | ■ Dock | □ Bottom sample |
| - Submergent | W Marsh | ⊗ Fish sample |
| I Emergent | W Wooded | ⊞ Brush shelter |
| | W Semi-wooded | |
| | — Permanent inlet | |
| | — Outlet | |
- ⊞ 120 BRUSH SHELTERS, IN 10 GROUPS OF 4 AND 16 GROUPS OF 5 EACH, INSTALLED JANUARY AND APRIL 1949.

- = Trapnet site
 = Fyke net site
 = Gill net site
 = Seine site
 = Boomshocker site
 Fish C

