

FISHERIES SAMPLING REPORT- Preliminary Data Summary

Silver Lake- Kingston, Pembroke, Plympton

Basin: South Coastal PALIS Code: 94143

Sample Date: August 27, 2013

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Silver Lake is located in the towns of Kingston, Pembroke and Plympton and abuts the town of Halifax (Figure 1.) It is a 640 acre Great Pond used as a primary water supply by the City of Brockton and functions as the headwaters of the Jones River. Silver Lake has man-made connections to Furnace Pond in Pembroke (Herring River Watershed) and East Monponsett Pond (Taunton River Watershed) used to augment its surface and groundwater inputs for water supply purposes. Due to its status as a primary water supply, the pond is closed to public access (although numerous pond front residences with kayaks and other water craft were noted during the survey). The purpose of the survey was to update fisheries data for the pond. Silver Lake is the headwaters of the Jones River and recent efforts have been made to reconnect the pond to the Jones River to allow migration of anadromous fish.

Methods

A variety of gear types (Table 1) were used to sample Silver Lake including experimental gill nets, seining and angling. Three experimental gill nets (125 feet total length, five 25-foot panels of 1", 1.25, 1.5, 1.75 and 2" bar mesh monofilament nylon) were set for 2 hour daytime sets for a total effort of 6 net-hours. The seine was 45 feet x 6 feet with ¼ inch mesh. Boat access (electric motors only with prior permission from the Brockton Water Dept.) was achieved through the Town of Kingston's Silver Lake Sanctuary (Figure 5). Sampling crew was Steve Hurley, Aaron Best, and Steve Wright with assistance from Pine Dubois of the Jones River Watershed Alliance. Boat assistance was provided to Mass. Dept. of Environmental Protection personnel Greg DeCesare and Mark Mattson. The temperature and dissolved oxygen profile (every 3 feet with 1 foot intervals in the thermocline) was conducted near the deepest spot in the lake using a Yellow Springs Instrument Co. model 51- B oxygen meter.

Results

Fisheries

A total of 371 fish of eight different fish species were sampled in Silver Lake (Table 2); yellow perch and white perch were the most numerous fish species sampled. American eel and brown bullhead can also be expected to occur but are seldom captured in the gear types used during this survey. Average lengths and length of fish sampled are in Table 3 and the length frequency distributions are in Figure 2.

Habitat

Water temperature ranged from 25.5 C (77.9 F) at the surface to 11.25 C (52.3 F) at the bottom (70 F); the thermocline was located between 19 to 30 feet (Figure. Dissolved oxygen ranged from 9.6 ppm at the surface to 10 ppm at 12-15 feet, dropped below 5 ppm at 19 feet, and dropped below 2 ppm at 21 feet. No summer trout water (<70 F and greater than 5 ppm dissolved oxygen) was detected. Extensive beds of rooted aquatic vegetation extended in the shallow areas of the lake from the Silver Lake Sanctuary towards the outlet to the Jones River.

Discussion

Silver Lake appeared to have a diverse warmwater fish community typical of area ponds. The inshore fish community was dominated by yellow perch, banded killifish, pumpkinseed and bluegill sunfish and largemouth bass; chain pickerel and smallmouth bass (Figure 4) were also present. Deeper water areas were dominated by white perch and smallmouth bass. Low oxygen levels were detected in the hypolimnion which may allow phosphorus from bottom sediments to enter the water column. Water quality in the pond should be monitored on a regular basis to determine the potential negative impacts of water imports from more fertile ponds (Furnace and East Monponsett Ponds).

Table 1. Sampling locations in Silver Lake, August 27, 2013.

Gear	Site Number	Location	Gear Type
Seine	1	Near launch Area Silver Lake Sanctuary (SLS)	Boat quarter seine
	2	South of Launch area (SLS)	Boat quarter seine
	3	Shoreline south of launch area (SLS)	Beach seine about 150 feet
	4	By outlet from bog Cloud property (SLS)	Boat quarter seine
Experimental Gill Net	1	Across lake from launch area	Experimental gill net 5 panels 1-2" mesh
	2	Near aqueduct outlet	Experimental gill net 5 panels 1-2" mesh
	3	Point north of cove north of launch area at SLS	Experimental gill net 5 panels 1-2" mesh

Table 2. Fish Species captured by gear type in Silver Lake August 27, 2013.

Common Name	Species	Experimental Nets				Seine					Rod and Reel	All Gear Types
		1	2	3	Total	1	2	3	4	Total		
American eel	<i>Anguilla rostrata</i>	<i>None captured by utilized gear types, expected to be common</i>										
Chain pickerel	<i>Esox niger</i>			1	1			2	2	4		5
Brown bullhead	<i>Ameiurus nebulosus</i>	<i>None captured by utilized gear types, expected in limited to common numbers</i>										
Banded killifish	<i>Fundulus diaphanus</i>					3	10	12		25		25
White perch	<i>Morone americana</i>	3	18	29	50						1	51
Pumpkinseed	<i>Lepomis gibbosus</i>						1	29	7	37		37
Bluegill	<i>Lepomis macrochirus</i>							20	1	21		21
Smallmouth bass	<i>Micropterus dolomieu</i>			2	2	1				1	2	5
Largemouth bass	<i>Micropterus salmoides</i>						3	14	2	19		19
Yellow perch	<i>Perca flavescens</i>						7	174	27	208		208
	Total	3	18	32	53	4	21	251	39	315	3	371

Table 3. Average length (mm and inches) and length ranges of fish sampled in Silver Lake, August 27, 2013.

Species	No.	Length (mm)		Length (inches)	
		Ave.	Range	Ave.	Range
Chain pickerel	4*	142	123-163	5.6	4.8 - 6.4
Banded killifish	25	82	45-98	3.2	1.8 - 3.9
White perch	51	208	170-277	8.2	6.7 - 10.9
Pumpkinseed	37	112	40-153	4.4	1.6 - 6.0
Bluegill	21	93	46-153	3.6	1.8 - 6.0
Smallmouth bass	5	319	81-420	12.6	3.0 - 16.5
Largemouth bass	19	72	62-102	2.8	2.4 - 4.0
Yellow perch	208	109	67-182	4.3	2.6 - 7.2

* one large chain pickerel captured in a gill net had been bitten in half by a snapping turtle and was not measured for total length

Figure 1. Depth map of Silver Lake.

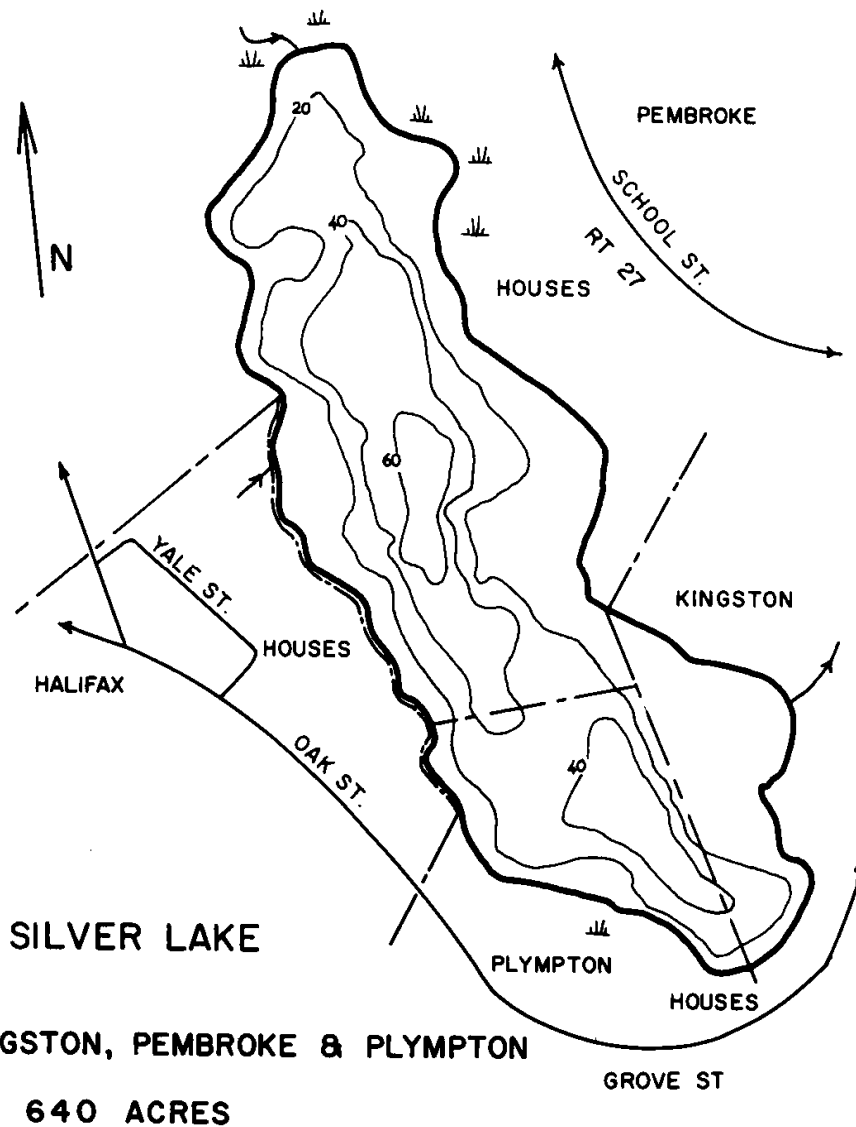


Figure 2. Length frequency distribution of fish species sampled in Silver Lake, August 2013.

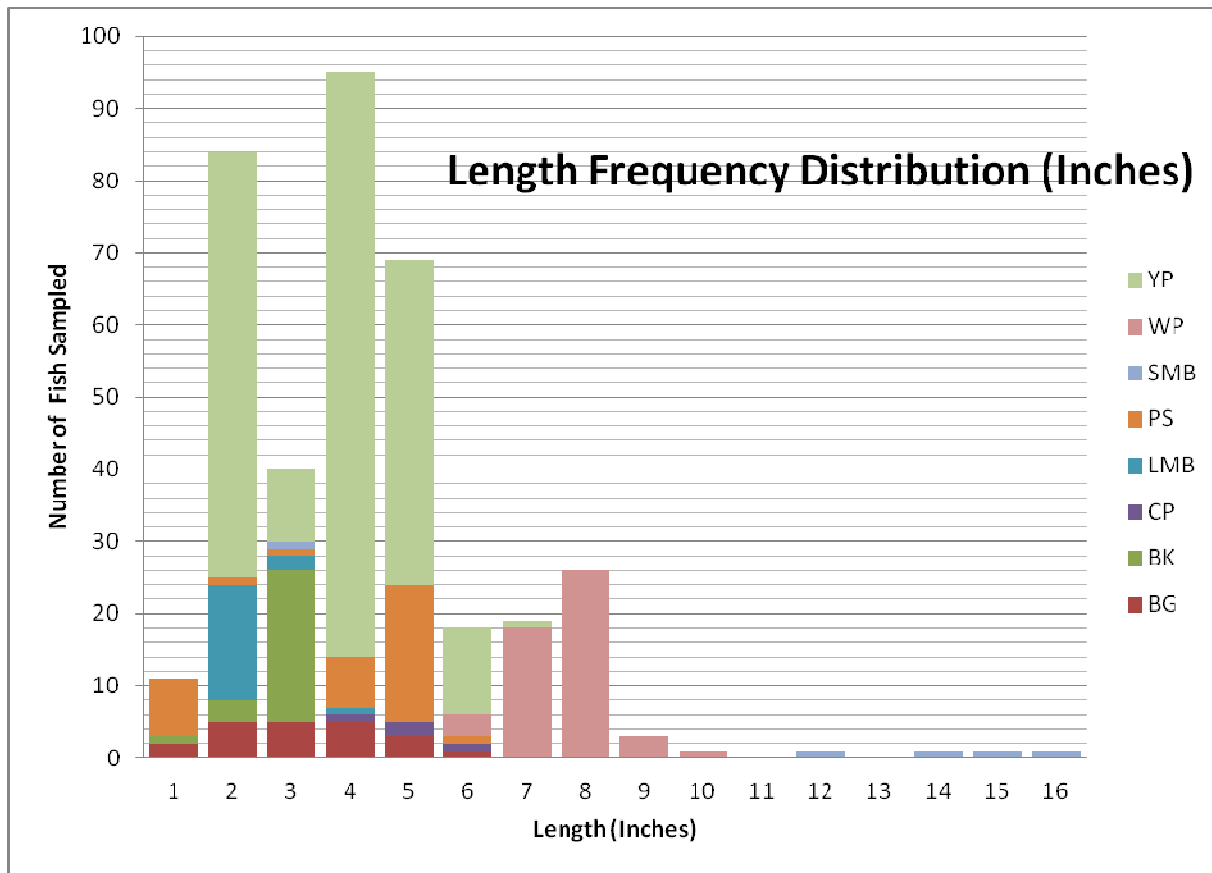


Figure 3. Temperature and dissolved oxygen profile in Silver Lake, August 23, 2013.

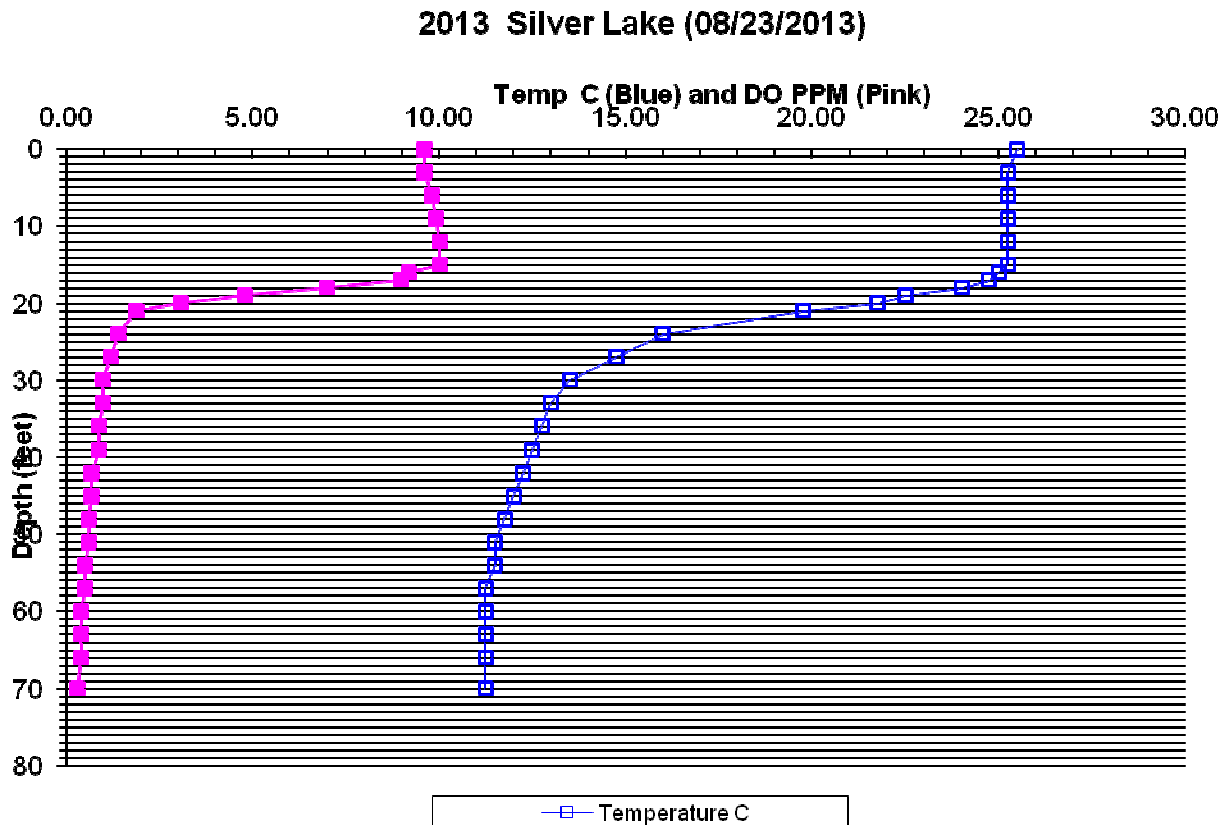


Table 3. Temperature and dissolved oxygen profile of Silver Lake, August 27, 2013.

Temperature - Dissolved Oxygen Profiles

Pond: Silver Lake Town: Kingston Pembroke Plympton
Date: 27-Aug-13 Time: 11:35 AM

Conductivity: 161 uS pH: 7.29
Transparency: clear 3.60 meters Alk:
11.8 feet

Air Temp: C

palis	Date	Depth (feet)	Temp. (C)	D.O. (ppm)	Temp (F)
94143	27-Aug-13	surface	25.50	9.6	77.9
94143	27-Aug-13	3	25.25	9.6	77.5
94143	27-Aug-13	6	25.25	9.8	77.5
94143	27-Aug-13	9	25.25	9.9	77.5
94143	27-Aug-13	12	25.25	10.0	77.5
94143	27-Aug-13	15	25.25	10.0	77.5
94143	27-Aug-13	16	25.00	9.2	77.0
94143	27-Aug-13	17	24.75	9.0	76.6
94143	27-Aug-13	18	24.00	7.0	75.2
94143	27-Aug-13	19	22.50	4.8	72.5
94143	27-Aug-13	20	21.75	3.1	71.2
94143	27-Aug-13	21	19.75	1.9	67.6
94143	27-Aug-13	24	16.00	1.4	60.8
94143	27-Aug-13	27	14.75	1.2	58.6
94143	27-Aug-13	30	13.50	1.0	56.3
94143	27-Aug-13	33	13.00	1.0	55.4
94143	27-Aug-13	36	12.75	0.9	55.0
94143	27-Aug-13	39	12.50	0.9	54.5
94143	27-Aug-13	42	12.25	0.7	54.1
94143	27-Aug-13	45	12.00	0.7	53.6
94143	27-Aug-13	48	11.75	0.6	53.2
94143	27-Aug-13	51	11.50	0.6	52.7
94143	27-Aug-13	54	11.50	0.5	52.7
94143	27-Aug-13	57	11.25	0.5	52.3
94143	27-Aug-13	60	11.25	0.4	52.3
94143	27-Aug-13	63	11.25	0.4	52.3
94143	27-Aug-13	66	11.25	0.4	52.3
94143	27-Aug-13	70	11.25	0.3	52.3

Figure 4. Smallmouth bass young-of-year from Silver Lake, August, 2013.



Figure 5. Shoreline view of Silver Lake, just south of launch area at Silver Lake Sanctuary, Kingston.

