Brook Trout Stocking Assessment Report

Sward Lake

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Sward Lake (10.3 ha) is located in Livingstone Township, 3 km west of Dividing Lake Provincial Park. Travelling northeast on Highway 35 from Dorset, turn right onto Kawagama Lake Road, then continue onto Livingstone Lake Rd. At Livingstone Lake turn right onto a Crown land access road. The lake is located 6.5 km from the turnoff from Livingstone Lake Rd.

One hunt camp is located on the southwest shore of the lake with a bridge access crossing Hinterland Creek. There is no place to launch a large boat on Sward Lake; however, a small aluminium boat can easily be carried a short distance and launched off the bridge going to the hunt camp.

Based on file information, a Brook Trout Index Netting (BTIN) survey was completed in 2005. No brook trout were caught in the survey and it was recommended that the lake be considered for stocking with brook trout on a put-grow-take basis. The first stocking event occurred in the spring of 2010 when 500 Dickson Lake strain brook trout were stocked. The fish were reared at the North Bay Fish Culture Station. They were approximately 7 g when stocked and had a left pectoral fin clip.

A one day assessment was completed on August 5, 2011. The purpose was to assess the population and the success of brook trout stocked in the spring of 2010.

Methods

The assessment was completed on August 5, 2011. The gear prescribed in the *Brook Trout Index Netting (*Monroe 2005) manual was used; two gangs, each consisting of three, 15 m panels of a single mesh size, 2 inch (51 mm) or 2.5 inch (64 mm). Two sets of two gangs were used. The net set depth and duration varied from the protocol; nets were set to target depths where the probability of capturing trout was believed to be the highest (in and near the thermocline). Sets were set for variable amounts of time; maximizing netting effort within the single day of the assessment.

Captured fish were measured for fork length, examined for fin clips and, if alive, released. Dead brook trout were examined for stomach contents and gonad state.

A temperature and dissolved oxygen profile was collected and the Secchi depth was measured to determine the availability of suitable habitat and the depths at which nets should be set.

Minnow traps, baited with dry dog food, were set in different habitats to determine the composition of the small fish community in the lake.

Results and Discussion

The lake was thermally stratified with the thermocline occurring between 3-4 m (Table 1). Dissolved oxygen declined slightly but remained at acceptable levels in the thermocline and fell below 4 ppm deeper than 6 m. A Secchi disk reading was taken at 12:10 pm at UTM coordinates 683234E and 5029654N. The Secchi disk reading was 2.4 m. The conditions were calm with 10% cloud cover.

Table 1 Dissolved oxygen and temperature profile, Sward Lake, August 5, 2011.

Depth (m)	Temperature ©	Dissolved Oxygen (PPM)
0.5	23.6	7.6
1.0	23.5	7.6
2.0	22.7	7.4
3.0	18.8	8.7
4.0	11.5	5.1
5.0	8.0	5.1
6.0	6.8	4.5
7.0	5.9	2.7
8.0	5.5	0.9

A total of seven net sets were completed (Figure 1, Table 2). Starting depths ranged from 1.8 to 4.6 m and ending depths ranged from 4.2 to 9 m. The sets were mainly perpendicular to the shore, starting at the edge of heavy aquatic vegetation growing near the shoreline. Sets number 3 and 4 were parallel with the shoreline, on drop offs with large rock and fallen tree cover, to stay within the desired depth range. Four nets out of 7 were approximately 2 hour sets; the remaining 3 were about 1 hour set times.

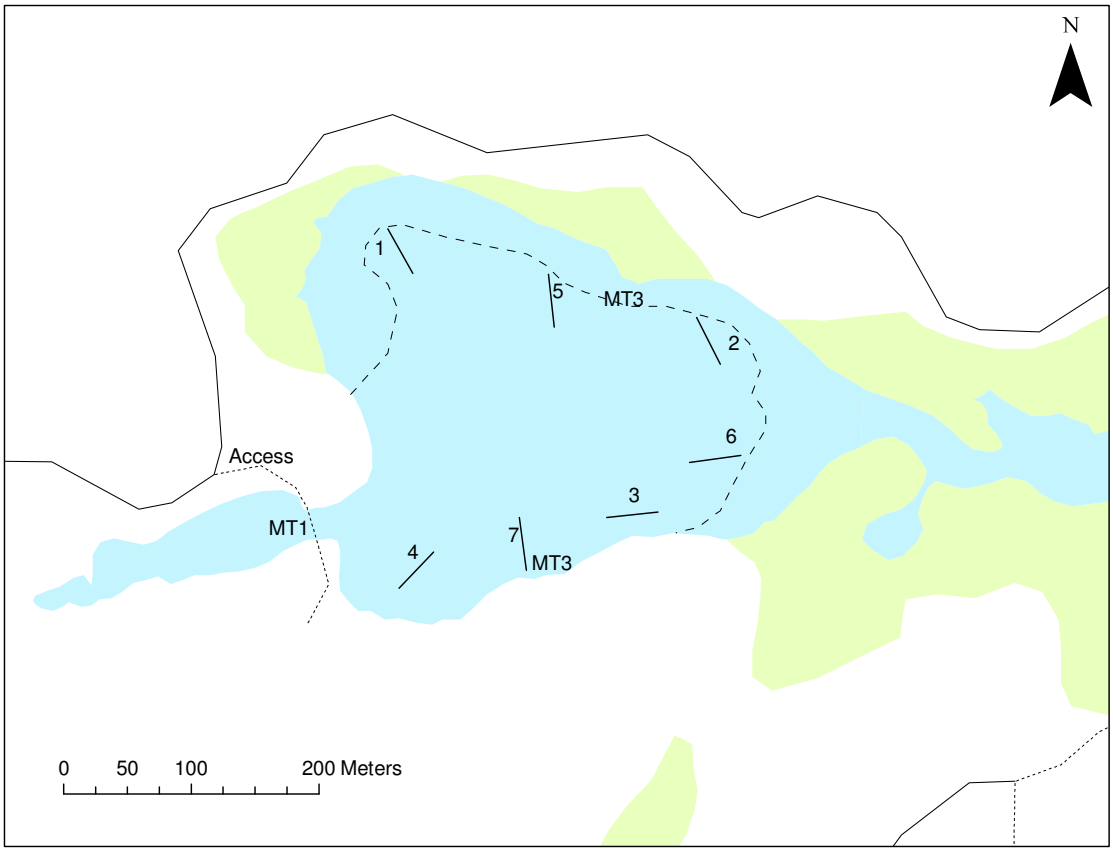


Figure 1 Map of Sward Lake showing gill net (1-7) and minnow trap (MT 1-3) set locations, Aug 5, 2011. Dotted line is approximately edge of dense vegetation.

Table 2 Net set details, Sward Lake, August 5, 2011.

Effort	Mesh Size (mm)	Start Depth (m)	End Depth (m)	Start Time	End Time	Wind Direction	Wind Speed (knots)	UTM Easting	UTM Northing
1	51	2.5	4.2	10:45am	12:35pm	0	0	683117	5029846
2	51	2.9	4.3	10:55am	12:55pm	0	0	683323	5029770
3	64	4.6	4.9	11:09am	13:25pm	0	0	683265	5029625
4	64	1.8	5.0	11:17am	12:20pm	0	0	683131	5029625
5	51	2.5	6.3	12:50pm	13:40pm	270	2	683218	5029787
6	51	2.5	8.0	13:20pm	14:30pm	0	0		
7	64	2.0	9.0	13:35pm	14:45pm	270	2	683243	5029609

Table 3 Gill net catch summary, Sward Lake, August 5, 2011. One additional trout, which had been entangled in a net (torn mesh still around snout; probably set 1 or 2) was found floating.

Net Set	brook trout	white sucker	pumpkinseed
1	1	6	
2		12	1
3	2	1	
4	1	3	
5	2	5	
6		2	
7	3	2	

A total of 10 brook trout, 28 white suckers and one pumpkinseed were caught in the nets (Table 3).

The 10 brook trout ranged in size from 300 to 390 mm fork length (Table 4). All trout caught had the left pectoral fin clipped indicating they were stocked. No naturally reproduced trout were caught. Of the six trout examined internally, 5 were immature females and one a male which appeared to be maturing but was unclear whether it would be in spawning condition this fall. Stomachs contained several small pumpkinseed, a brook stickleback and other fish remains. One stomach contained a bolus of small particles from which several individuals of the large zooplankter *Leptodora* was later identified.

The white suckers ranged from 210 to 382 mm fork length and the pumpkinseed measured 138 mm FL.

The minnow traps all captured large numbers of pumpkinseeds for the short time they were set. Small numbers of creek chubs, golden shiners and northern redbelly dace were also caught (Table 5). The catch of golden shiners was the first record of the species in the lake, although it is possible that they were native. All other species had been documented previously.

Table 4 Brook trout characteristics, Sward Lake, Aug 5, 2011.

Fish Number	Fork Length (mm)	Gonad Status	Stomach Contents	Comments
7	390	N/A	N/A	Found floating in water, LP
2	300	N/A	N/A	LP, released
21	378	Immature female	empty	LP
22	312	N/A	N/A	LP, released
23	332	Immature Female	3 Pumpkinseeds	LP
27	350	N/A	N/A	LP, released
29	321	Developing male	Leptodora	LP
33	340	Immature female	unknown	LP
36	367	Immature female	Brook Stickleback	LP
37	325	Immature female	Unidentifiable fish	LP

Table 5 Contents of minnow traps, Sward Lake, August 5, 2011.

Species	Trap 1	Trap 2	Trap 3
Pumpkinseed	X	X	X
Creek Chub	X		
Golden shiner	X		X
Northern redbelly dace		X	X

Conclusions and Recommendations

Sward Lake appears to be a viable lake for brook trout. The number of trout caught exceeded the expectations of the estimated catch. The lake has a large population of baitfish which the trout were actively feeding upon. The lake has a variety of habitats which are favoured by brook trout. There is an abundance of aquatic vegetation which provides cover for trout; mainly observed were the white water lily and the watershield. The southern shoreline had many boulders, fallen logs and a steep drop off near shore, providing excellent habitat for trout. Even in late summer there was still an abundance of oxygen in and below the thermocline. After analyzing the results of the assessment on Sward Lake on August 5 2011, it is recommended that the stocking of brook trout continue for future angling purposes.

References

Monroe, B. 2005. Manual of instructions: brook trout index netting. Ontario Ministry of Natural Resources, Algonquin Fisheries Assessment Unit, Whitney, Ontario.

Appendix White sucker fork lengths, Sward Lake, August 5, 2011.

Effort	Fish	FL
1	1	332
1	3	294
1	4	332
1	5	245
1	6	210
2	8	375
2	9	340
2	10	305
2	11	215
2	12	285
2	13	218
2	14	216
2	16	215
2	17	225
2	18	220
2	19	218
3	20	327
4	24	341
4	25	348
4	26	350
5	28	324
5	30	325
5	31	347
5	32	351
6	34	319
7	35	382
7	38	350
7	39	372