Splake Stocking and Fish Community Assessment of Grandview Lake 2010

File Report

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Grandview Lake (Figure 1) is a small (74 ha), relatively deep (26 m), clear water (Secchi: 5.7 m DMM 2008) lake located in Ridout Township. The lake is accessible by the public directly off Hwy 117, between Baysville and Dorset. There is no launch for trailered boats but small boats and canoes may be put in at a landing.

The composition of the native fish community is not documented; stocking of several species began before the first survey. Lake and brook trout were stocked beginning in 1939 and 1943, respectively; the early dates suggesting that if there were native populations the abundance was low. Smallmouth bass were introduced beginning in 1948. Lake trout stocking continued, periodically, until 1975. A lake trout population assessment was done in 1976. Nine lake trout were caught of which six did not have hatchery fin clips suggesting some natural reproduction was occurring. It was recommended that the lake should no longer be managed for lake trout due to the limited amount of habitat and low abundance of stocked and possibly natural fish.

Splake stocking began in 1986. An assessment in 1988 caught no stocked splake. A follow-up assessment was planned but never completed and splake stocking continued until the present (Table 1). Three large lake trout were also caught in this assessment.

Anecdotally, it appeared that there was little fishing effort directed at the stocked splake, suggesting that the fishery was poor. An assessment was completed in 2010 to obtain current information on the composition of the fish community and on the abundance and population characteristics of stocked splake.

METHODS

Aspects of the Brook Trout Index Netting (BTIN, Monroe 2005) and Summer Profundal Index Netting (SPIN, Sandstrom et al 2007) gear and protocols were used. The intent was to use a variety of gear to maximize the chance of detecting all of the major fish species that were present, with an emphasis on mesh sizes expected to catch splake.

The BTIN gear consisted of two monofilament gillnets that were 90 m long by 2.4 m high. Each net was comprised of 6 panels, all of one mesh size; one of 2 inch mesh and the second of 2.5 inch mesh.

SPIN gear consisted of gill nets that were 64 m long by 1.8 m high and had two eight-panel gangs of the following stretch mesh sizes; 2.25, 2.50, 2.75, 3.00, 3.50, 4.00, 4.50 and 5.00 inch. The mesh sizes were randomly arranged.

A third gill net comprised two panels of 1.0 inch mesh was also used.

Captured fish species were measured for fork length and age structures were taken from target species.

A zooplankton net haul was done to look for the presence of invasive spiny water flea.

A temperature and dissolved oxygen profile was available from the District of Muskoka sampling program (Appendix).

RESULTS and DISCUSSION

Netting was conducted in two time periods; August 11-12 and August 18-19, 2010 (Table 2). In the first period eight sets were completed; five short duration daytime sets (three BTIN, two SPIN) and three overnight sets (two BTIN, one SPIN). The second set of net sets was done specifically to target ciscos which were not caught in the first eight sets. All were overnight sets (one BTIN, two SPIN and one small mesh gill net). Nets were generally set in and below the thermocline to target splake and cisco.

The catch was dominated by white suckers (105 caught), followed in order of abundance by smallmouth bass (22), burbot (12), splake (2), rock bass (1) and lake trout (1)(Table 3).

The two splake caught were both large individuals (582 and 698 mm FL, Table 4, Table 5). The larger individual was aged to be 8 years old. An age could not be determined from the other.

The lake trout was also a large individual with a partially regenerated fin clip indicating that it was a stocked fish. It was aged to be 36 years old, which corresponds fairly closely with the last documented stocking event in 1975.

Changes to the fish community composition have occurred since the last assessment in 1988. Rock bass have become established through unknown means. Only one was caught but they are probably more abundant than the netting suggests, as most netting effort was in or below the thermocline, where rock bass would not typically occur.

No ciscos were caught, despite being abundant in previous assessments. While it is not conclusive that they no longer occur in the lake, at the very least the abundance appears to be

dramatically lower than in the past. The reason for the decline isn't known. The abundance of deep water predators does not appear to be high enough to have affected the population greatly. It is possible that non-native smelt, which were detected in previous surveys, impacted the cisco through competition for zooplankton food or depredation on larval cisco. No smelt were caught in 2010, though it is likely that they are still present (they are only vulnerable to the smallest mesh sizes used and may escape detection if the abundance is low).

No naturally reproduced lake trout or brook trout were caught. In 1976, several unclipped lake trout and one unclipped brook trout were caught, indicating that some reproduction was occurring. If they are still present in the lake their abundance must be very low.

The zooplankton haul did not yield any spiny water flea, but large numbers of native water fleas were caught.

Despite regular stocking of relatively large numbers of splake, only two were caught; both large, older individuals. Early survival of stocked fish is very poor. This phenomenon has been observed in other splake lakes in the District. It appears to be related to high water clarity and the presence of other large predators, notably smallmouth bass. It is speculated that direct depredation by and/or competition with bass is causing low survival of newly stocked fish. The splake that were caught were large and robust indicating that the fish that do survive past the early post–stocking period can find ample food, grow quickly and live a long time.

In recent years the stocking rate of splake was consistently 2500 fish. Using a rough average size at stocking of 50 g, the recommended stocking rate is about 1900 to 2300 fish (2.0-2.5 kg/ha for waters > 6 m deep; OMNR 2002). The recommended rate is a generalized value based on a limited number of studies. While the actual rate was only modestly above the recommended rate, it may be excessive for the available food resources for small fish in Grandview Lake, resulting in poor survival.

A trial has been initiated to stock splake as fall yearlings in Clear (Perry Twp.) and Corkery Lakes where low early survival has been observed as well. This trial is intended to determine whether the postulated early-survival bottleneck can be by-passed by stocking larger fish and stocking them in the fall when bass are becoming less active. If better returns can be obtained using this strategy, it could be applied to Grandview Lake as well. If not, stocking less frequently or at a lower density could be attempted to explore whether excessive stocking is reducing the availability of food for newly stocked fish. Failing that, discontinuation of splake stocking would be appropriate as a reasonable fishery is not currently being created. If splake stocking is

discontinued the stocking of a species that could perhaps take better advantage of the deep water habitat and apparent zooplankton abundance, such as rainbow trout, could be considered.

REFERENCES

DMM, 2008. Grandview Lake, lake data sheet. District Municipality of Muskoka.

Monroe, B. 2005. Manual of instructions: brook trout index netting. Fish and Wildlife Branch. Ontario Ministry of Natural Resources, Peterborough, Ontario.

OMNR. 2002. Guidelines for stocking fish in inland waters of Ontario. Ontario Ministry of Natural Resources, Peterborough.

Sandstrom, S. and N. Lester. 2009. Manual of instructions for Summer Profundal Index Netting (SPIN): a lake trout assessment tool. Ontario Ministry of Natural Resources, Peterborough, Ontario. Version 2009.1. 22 p. + appendices.

Table 1 Recent splake stocking history, Grandview Lake. All recent stockings were of spring yearlings.

Year	Number
2004	2500
2006	2500
2008	2500
2010	2500

Table 2 Net set details, Grandview Lake, 2010.

Effort	Date	Gear	Mesh Size (in)	Easting	Northing	Depth 1 (Start)	Depth 2 (mid)	Depth 3 (end)	Set Time	Lift Time	Comments
1	11-Aug-10	BTIN	2.5	653059	5007453	5	7	11	10:05	12:02	
2	11-Aug-10	BTIN	2.0	652825	5006858	5	9	13	10:20	12:20	
3	11-Aug-10	BTIN	1.5	653210	5007380	10	14	17	10:45	12:42	
4	11-Aug-10	SPIN	2.25 - 5.0	652923	5007180	8	13	17	11:05	13:05	
5	11-Aug-10	SPIN	2.25 - 5.0	653218	5006899	9	13	16	11:30	13:28	
6	11-Aug-10	SPIN	2.25 - 5.0	652866	5007162	8	16	17	13:40	9:30	Overnight Set
7	11-Aug-10	BTIN	2.0	652863	5007291	11	9	10	13:50	10:20	Overnight Set
8	11-Aug-10	BTIN	2.5	652845	5006857	7	9	15	14:00	11:00	Overnight Set
9	18-Aug-10	BTIN	1.5	653105	5007244	6	18	20	13:45	9:30	Overnight Set
10	18-Aug-10	Gill Net	1.0	652930	5007198	6	12	17	14:00	9;50	Overnight Set
11	18-Aug-10	SPIN	2.25 - 5.0	655966	5006790	13	17	19	14:15	10:05	Overnight Set
12	18-Aug-10	SPIN	2.25 - 5.0	653196	5006901	14	16	18	14:30	10:30	Overnight Set

Table 3 Catch summary for Grandview Lake, 2010.

Set No.	lake trout	splake	white sucker	burbot	rock bass	smallmouth bass
1						1
2			2			
3						
4			13			4
5			4			
6			27	2		2
7			26			6
8		2	18	3		5
9			1	4	1	1
10						
11			4	1		2
12	1		10	2		1
Total	1	2	105	12	1	22

Table 4 Descriptive statistics of the fork lengths of captured fish, by species, Grandview Lake, 2010.

	lake trout	splake	white sucker	burbot	rock bass	smallmouth bass
n	1	2	105	12		22
mean	735	640	411	337		329
min.		582	163	213		143
max.		698	534	450		447
std. dev.		82	78	83		105

Table 5 Fork length frequency distribution, by species, Grandview Lake, 2010.

Fork Length (mm)	lake trout	splake	white sucker	burbot	smallmouth bass
125-149					1
150-174			1		
175-199					2
200-224			1	1	
225-249			6	2	4
250-274			3		3
275-299			2		
300-324			6	2	
325-349			2	2	
350-374				1	
375-399			1		2
400-424			18	1	3
425-449			34	2	6
450-474			12	1	
475-499			14		
500-524			1		
525-549			2		
550-574					
575-599		1			
600-624					
625-649					
650-674					
675-699		1			
700-724					
725-749	1				

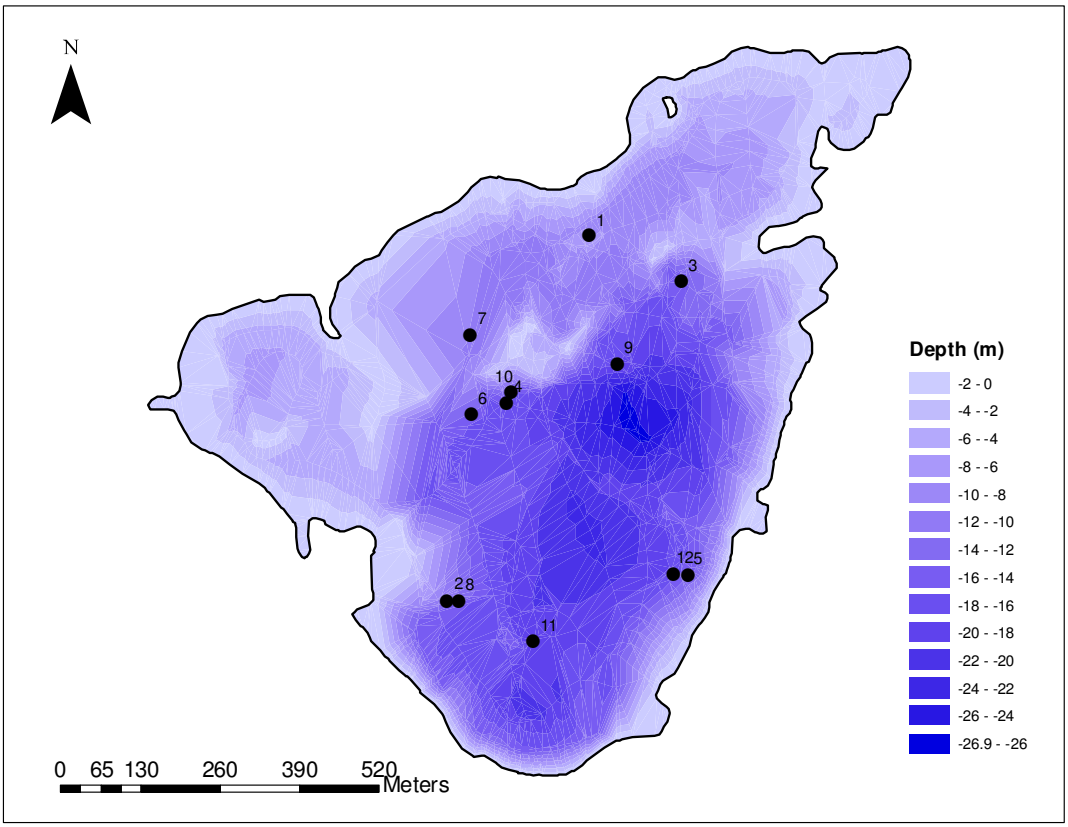
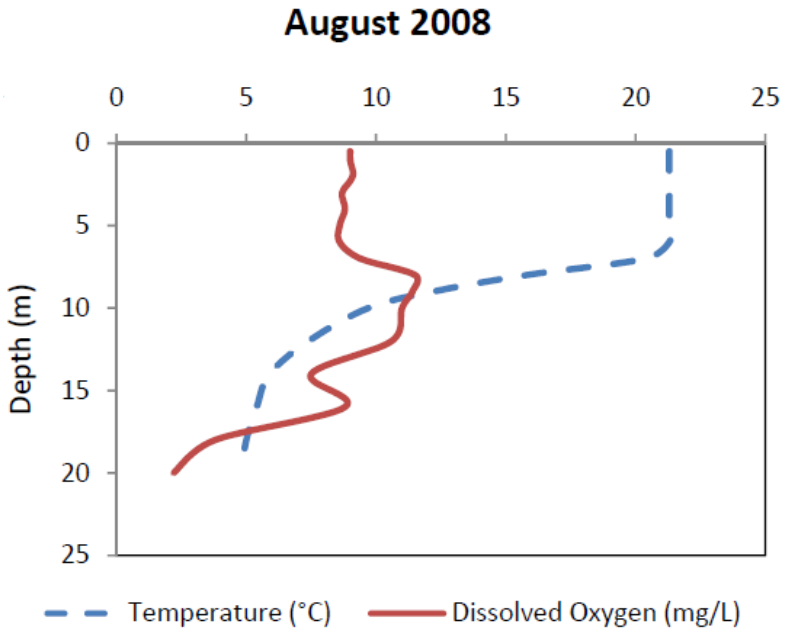


Figure 1 Map showing bathymetry and net set locations, Grandview Lake, 2010.

Appendix Temperature and dissolved oxygen profile from Grandview Lake, August 2008 (DMM 2008).



Appendix Detailed fish information, Grandview Lake, 2010.

Effort	Mesh Size (in)	Species	Fish #	Fork Length (mm)	Fate	Comments
1	2.5	316	1	430	RF	
2	2.0	163	2	492	RG	
2	2.0	163	3	427	RG	
3						no catch
4	2.8	163	4	_	RG	
4	2.8	163	5	465	RG	
4	2.8	163	6	465	RG	
4	2.8	163	7	440	RG	
4	5.0	163	8	494	RG	
4	5.0	163	9	526	RG	
4	2.5	163	10	405	RG	
4	2.5	163	11	399	RG	
4	2.5	163	12	430	RG	
4	4.5	163	13	_	RG	
4	4.5	163	14	413	RG	
4	4.5	163	15	450	RG	
4	4.5	316	16	440	RG	
4	4.5	316	17	_	RG	
4	4.5	316	18	440	RG	
4	4.5	316	19	393	RG	
4	4.5	163	20	492	RG	
5	4.5	163	21	439	RG	
5	4.0	163	22	437	RG	
5	4.0	163	23	417	RG	
5	4.0	163	24	430	RG	
6	4.5	163	25	493	RG	
6	4.5	163	26	433	RG	
6	2.5	163	27	489	RG	
6	2.8	163	28	467	RG	
6	2.8	163	29	452	RG	
6	4.0	163	30	432	RG	
6	4.0	163	31	455	RG	
6	4.0	163	32	427	RG	
6	4.0	163	33	420	RG	
6	4.0	163	34	440	RG	
6	4.0	163	35	438	RG	
6	4.0	163	36	477	D	
6	4.0	163	37	480	D	
6	4.0	163	38	440	RF	
6	2.3	271	39	336	RG	
6	2.3	271	40	324	RG	
6	3.5	163	41	445	D	
6	3.5	163	42	422	RG	
6	3.5	163	43	448	RG	
6	3.5	163	44	424	RG	
6	3.5	163	45	437	D	
6	3.5	163	46	434	RG	
6	3.5	163	47	468	RG	
6	3.5	163	48	480	RG	
6	3.0	163	49	445	RG	
6	3.0	316	50	437	D	

Effort	Mesh Size (in)	Species	Fish #	Fork Length (mm)	Fate	Comments
6	3.0	163	51	428	RG	
6	3.0	163	52	418	RG	
6	3.0	163	53	435	RG	
6	2.0	163	54	455	RG	
6	2.0	316	55	447	RG	
7	2.0	316	56	382	D	
7	2.0	163	57	288	D	
7	2.0	163	58	240	D	
7	2.0	163	59	427	D	
7	2.0	163	60	224	D	
7	2.0	163	61	438	D	
7	2.0	316	62	256	D	
7	2.0	163	63	432	RG	
7	2.0	316	64	188	D	
7	2.0	163	65	422	RG	
7	2.0	163	66	426	RG	
7	2.0	163	67	230	D	
7	2.0	163	68	306	RG	
7	2.0	163	69	256	D	
7	2.0	163	70	343	D	
7	2.0	163	71	236	D	
7	2.0	163	72	320	D	
7	2.0	163	73	422	RG	
7	2.0	163	74	519	RG	
7	2.0	163	75	325	D	
7	2.0	163	76	468	RG	
7	2.0	163	77	317	D	
7	2.0	163	78	306	D	
7	2.0	316	79	411	D	
7	2.0	163	80	232	D	
7	2.0	163	81	243	D	
7	2.0	316	82	185	D	
7	2.0	163	83	305	RG	
7	2.0	163	84	324	D	
7	2.0	163	85	233	D	
7	2.0	163	86	269	D	
7	2.0	316	87	227	RG	
8	2.5	163	88	417	RG	
8	2.5	163	89	433	RG	
8	2.5	163	90	421	RG	
8	2.5	163	91	432	D	
8	2.5	271	92	412	D	
8	2.5	163	93	425	RG	
8	2.5	163	94	453	RG	
8	2.5	163	95	455	RG	
8	2.5	316	96	238	RG	
8	2.5	163	97	405	RG	
8	2.5	163	98	400	RG	
8	2.5	163	99	443	RG	
8	2.5	163	100	417	RG	
8	2.5	271	101	355	RG	
8	2.5	163	102	422	D	
8	2.5	163	103	490	RG	

Effort	Mesh Size (in)	Species	Fish #	Fork Length (mm)	Fate	Comments
8	2.5	271	104	330	D	
8	2.5	163	105	445	D	
8	2.5	163	106	435	RG	
8	2.5	163	107	287	D	
8	2.5	316	108	247	RG	
8	2.5	316	109	242	RG	
8	2.5	316	110	274	RG	
8	2.5	163	111	410	RG	
8	2.5	316	112	259	D	
8	2.5	163	113	266	D	
8	2.5	82	114	698	D	age:8
8	2.5	82	115	582	D	no age:vaterite
9	1.5	271	116	237	D	
9	1.5	311	117		D	
9	1.5	316	118	143	D	
9	1.5	163	119	163	D	
9	1.5	271	120	302	D	
9	1.5	271	121	227	D	
9	1.5	271	122	213	D	
10						no catch
11	5.0	163	123	534	RG	
11	2.5	271	124	430	RP	
11	4.5	316	125	445	RF	
11	4.5	163	126	461	F	
11	4.5	316	127	407	D	
11	4.5	163	128	499	R	
11	4.5	163	129	475	R	
12	3.0	163	130	433		
12	3.0	316	131	409		
12	3.0	271	132	430		
12	3.0	163	133	428	D	
12	3.0	163	134	438	D	
12	3.5	163	135	432	D	
12	3.5	163	136	420	D	
12	3.5	163	137	496	D	
12	3.5	163	138	490	D	
12	2.3	81	139	735	D	TL: 797; RWT: 3900; dev. male; LV clip; 36 yo
12	2.3	271	140	450	D	
12	4.0	163	141	422	D	
12	4.0	163	142	435	D	
12	4.5	163	143	490	D	

Note: R: released, RG: released in good health, RF: released in fair health, RP: released in poor health, D: dead in net