Fish Community and Lake Trout Population Assessment of Loon Lake 2016

File Report

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Loon Lake is located in Proudfoot Township, Parry Sound District. The lake has an approximate surface area of 156 ha. The mean depth is 11 m with a maximum depth of 29 m. Water clarity is high with a secchi disk reading of 6.5 m indicating an oligotrophic state (Lake Fact Sheet, 2014). The water level is regulated and controlled by the MNR-owned and operated dam in accordance with the Magnetawan River Operating Plan. Loon Lake is connected to Grass Lake via a dredged channel approximately 1 m deep. The lake is accessed via a public boat launch near the dam.

The fish community is currently made up of the major fish species Lake Trout, Round Whitefish, Smallmouth Bass (introduced), Burbot and White Sucker. Yellow Perch, Creek Chub, Lake Chub, Common Shiner and Rainbow Smelt (introduced) also inhabit the lake. The invasive species spiny water flea has also been reported in the lake (Lake Fact Sheet, 2014).

Loon Lake provides fair habitat for Lake Trout due to good late summer hypolimnetic dissolved oxygen, however the volume of deep water nursery habitat is limiting. In 1984, a Lake Trout Spawning Bed Assessment found approximately 20 areas suitable for trout spawning, however no spawning behavior was observed, and no eggs were found (Pots 1984).

Lake Trout stocking began in 1949, due to the limited amount of natural recruitment occurring, with intent to manage as a Lake Trout fishery. Lake Trout were regularly stocked on a put-grow-take basis until 2005 (Table 1). The lake is currently designated for management of Lake Trout on a Put-Grow-Take basis (OMNR 2015).

Table 1 History of Lake Trout stocking in Loon Lake since 1980.

Year	Number of Fish
1980	4,600
1982	3,600
1985	4,100
1987	2,000
1989	4,464
1990	4,600
1993	2,000
1996	600
1999	2,000
2002	2,000
2005	1,000

In 1982, a Lake Trout population assessment found 70 percent of the population were hatchery origin. The remaining 30 percent of natural origin were believed to be emigrants from Grass Lake (although there was no direct evidence of movement between the two lakes). Continuation of Lake Trout stocking was recommended (Lake Fact Sheet, 2014).

In 2004, a Spring Littoral Index Netting (SLIN) survey captured 10 Lake Trout, of which only 2 were of hatchery origin. It seemed unlikely that emigration of the magnitude from Grass Lake was occurring and thus there appeared to be significant presence of naturally reproduced fish. Water quality was also in the range that is favourable to natural reproduction; close to the 7 ppm dissolved oxygen criterion. Stocking was suspended in 2005 as it may have had a negative effect on the natural fish (Lake Fact Sheet, 2014).

Rainbow Smelt were anecdotally reported in 2012 and their presence was confirmed in 2014. The illegal introduction of the smelt may impact reproduction of the Lake Trout through predation on or competition with the young.

Summer Profundal Index Netting (SPIN) was completed on Loon Lake in July 2016. The purpose of this survey was to collect data on the health of the population of Lake Trout. Also, the small-mesh gill net component of the Broad-scale Monitoring (BsM) protocol was also completed to target smaller fish and

collect information on species presence. Finally, visual observations of potential Lake Trout spawning locations were conducted in the fall to try to document the occurrence of successful natural reproduction.

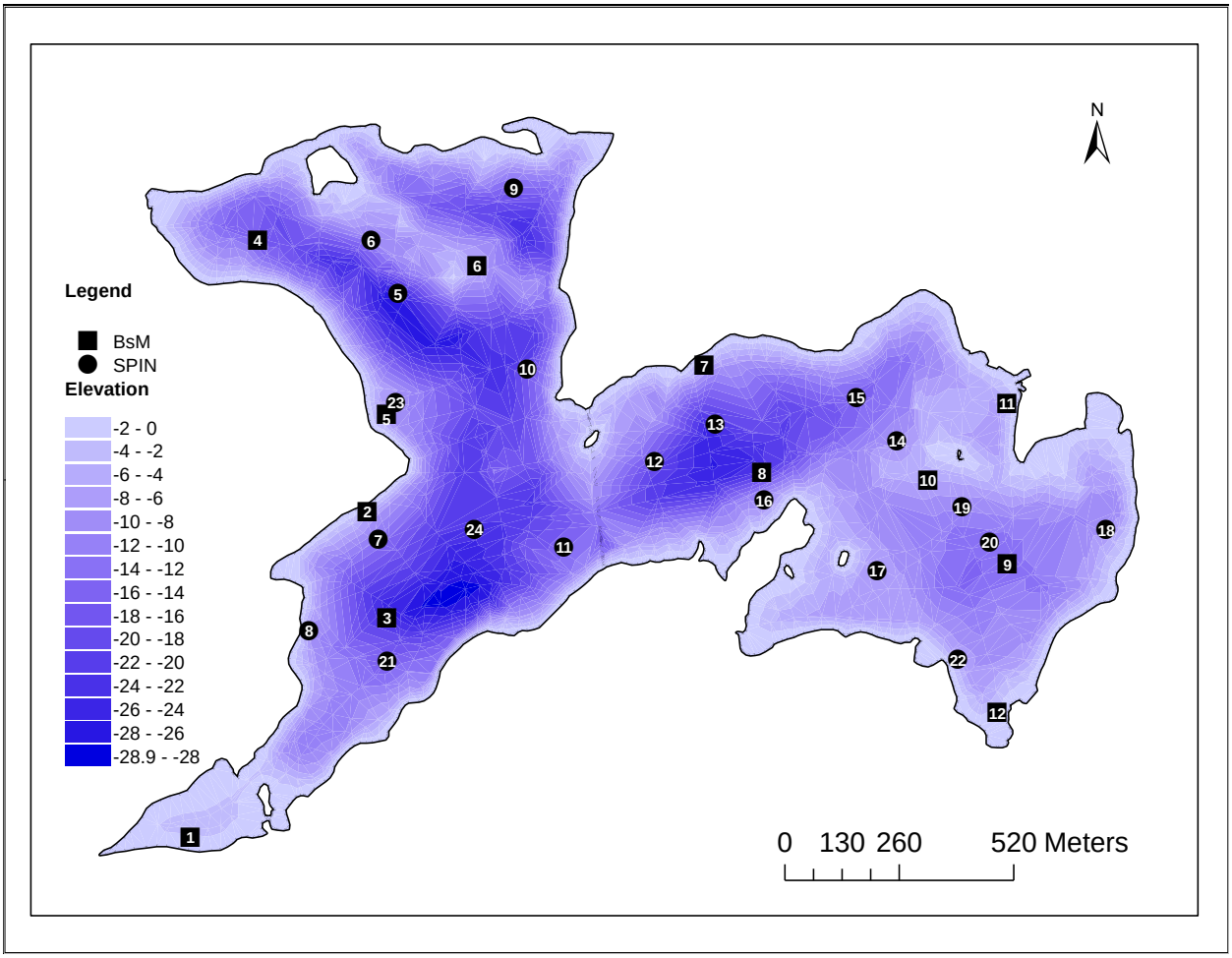


Figure 1 Map of Loon Lake showing bathymetry and SPIN and BsM net set locations, 2016.

Methods

Summer Profundal Index Netting protocol was followed (Sandstrom and Lester, 2009). Gear consisted of gill nets gangs 64 m long and 1.8 m high, containing 8 panels per gang. The mesh sizes, in inches, are 2.25”, 2.50”, 2.75”, 3.00”, 3.50”, 4.00”, 4.50” and 5.00”. Single gang straps were set due to the relatively small size of the lake.

Net sets 1 through 4 were accidentally set using large-mesh (NA-1) gill nets normally used in the Broad-scale Monitoring program. Large-mesh gillnets have a length of 24.8 m consisting of 8 panels per gang which are 1.8 meters high. The mesh sizes, in inches, are 1.50”, 2.00”, 2.50”, 3.00”, 3.50”, 4.00”, 4.50” and 5.00”. All efforts were single gang sets (Sandstrom and Lester, 2009). These nets were not used for abundance estimates but fish caught in them were included in the analysis of population characteristics.

Nets were set between July 18, 2016 and July 20, 2016. Efforts were allocated over the depth strata 6-10, 10-20 and 20-29 meters. Nets were set between 10:00 and 14:00 for a time frame of 2 hours. A total of 24 sets were completed; 20 SPIN sets and 4 BsM large-mesh sets.

Net sets were allocated to each stratum in the same proportion as the percentage of the lake in each stratum. Nets sites were chosen randomly, with the caveat that each deep bay had at least one set (Figure 1).

In addition, the small mesh gill net component of the Broad-scale Monitoring protocol was followed (Sandstrom et al., 2015). Gear consisted of small mesh (ON-2) gill nets 12.5m long and 1.8m high, containing 5 panels per gang. The mesh sizes, in inches, are 0.50", 0.75", 1.00", 1.25" and 1.50". All efforts were set as single gang except effort 1 and 12 which were set as double gangs.

Nets were set between July 17, 2016 and July 19, 2016 overnight for a time frame of 16-22 hours. Efforts were allocated over the depth strata 0-3, 3-6, 6-12, 12-20, 20-29 meters. Set locations were decided using the same method as SPIN set locations however weighted toward shallower depth stratums as the purpose was to target smaller fish.

The fork length was measured for all captured fish. Fork length, weight and note of any fin clips were recorded for all Lake Trout. In addition any Lake Trout that were dead on capture were subject to more inclusive sampling, consisting of length, weight, gender and stomach contents. Aging structures were collected from all Lake Trout; pectoral rays from those that were released and otoliths from those dead on capture.

A temperature-dissolved oxygen profile was collected to determine how the lake was thermally stratified and the availability of oxygen.

Visual observations for Lake Trout spawning activity entailed cruising the shoreline at night using an underwater light. Previously completed mapping of potential spawning areas was used as a guide but additional areas were also visited. A known spawning site on Grass Lake was also visited to confirm that the timing of observations was appropriate.

Results

Summer Profundal Index Netting occurred on July 18th, 19th and 20th. At the time, the lake was thermally stratified with the thermocline occurring from approximately 5 to 10 metres deep (Figure 2). The dissolved oxygen measurements exhibited a positive heterograde profile, with the oxygen concentration increasing in the thermocline due to the high water clarity. Useable Lake Trout habitat (<15^{o}C and >4 mg/l D.O.) occurred from about 7 m deep to the bottom of the lake. Optimum habitat was similar (<10^{o}C and >6 mg/l) occurring from 8 m to the bottom.

A total of 20 single gang sets were completed of which 6 were in the 6-10 meter stratum, 10 were in the 10-20 meter stratum, and 4 were in the 20-29 meter stratum. In addition the first 4 net set locations (efforts 1 through 4) were set using large-mesh Broad-scale nets. Efforts 21-24 were set again at these locations using SPIN nets to correct this mistake. Data from the large-mesh broad-scale net sets has been included in the results (Figure 1, Table 2).

The catch summary for the SPIN netting efforts is as follows: 8 Lake Trout, 1 Rainbow Smelt, 1 Round Whitefish, 27 Smallmouth Bass and 46 White Suckers. All species caught were previously documented in the lake (Table 3).

Broad-scale netting efforts occurred on July 17th, 18th and 19th. A total of 12 sets were completed of which 3 were in the 0-3 meter strata, 3 in the 3-6 meter strata, 2 in the 6-12 meter strata, 2 were in the 12-20 meter strata and 2 were in the 20-29 meter strata (Figure 1, Table 4).

Depth (m)	Temp (˚C)	DO(mg/l)
0.5	23.3	8.4
1	23.2	8.4
2	23.2	8.4
3	23.0	8.5
4	22.8	8.5
5	22.2	8.9
6	16.6	11.8
7	12.6	12.6
8	10.0	12.0
9	8.4	11.5
10	7.2	10.8
11	6.5	10.5
12	6.0	9.9
13	5.8	9.5
14	5.6	9.1
15	5.5	8.9
16	5.4	8.7
17	5.3	8.5
18	5.3	8.5
19	5.3	8.4
20	5.3	8.2
21	5.3	8.2
22	5.3	8.0
23	5.3	7.8
24	5.2	7.4
25	5.2	7.2
26	5.2	6.4

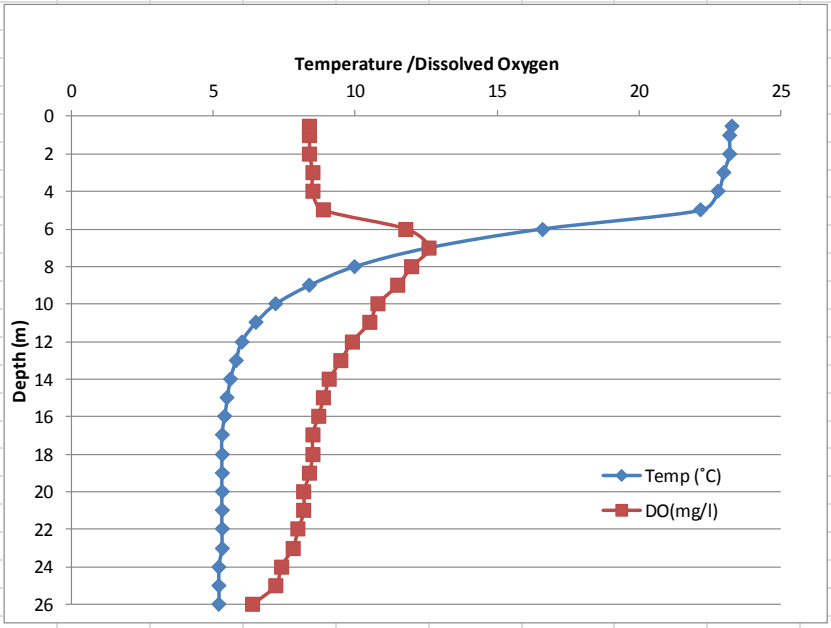


Figure 2 Dissolved oxygen and temperature profile from Loon Lake, July 17, 2016.

Table 2 Summer Profundal Index Netting set details, Loon Lake, 2016.

Effort	Easting	Northing	Set Date	Set Time	Lift Time	Gear	Total Gangs	Stratum	Depth Start (m)	Depth End (m)
1	638201	5058305	18/07/2016	10:05	12:15	BsMlg	1	10 - 20	11	13
2	638328	5058449	18/07/2016	10:30	12:35	BsMlg	1	20 - 29	21	27
3	638329	5058666	18/07/2016	10:50	13:00	BsMlg	1	20 - 29	20	23
4	638210	5058928	18/07/2016	11:10	13:15	BsMlg	1	6 -10	7	9
5	638222	5059182	18/07/2016	11:40	13:39	SPIN	1	20 - 29	20	27
6	638161	5059302	18/07/2016	12:10	14:09	SPIN	1	10 - 20	11	15
7	638177	5058624	18/07/2016	12:30	14:30	SPIN	1	10 - 20	11	16
8	638020	5058418	18/07/2016	12:50	14:48	SPIN	1	6 -10	7	10
9	638485	5059421	19/07/2016	10:00	12:14	SPIN	1	10 - 20	12	21
10	638516	5059011	19/07/2016	10:25	12:21	SPIN	1	10 - 20	12	18
11	638599	5058607	19/07/2016	10:45	12:55	SPIN	1	10 - 20	18	15
12	638805	5058802	19/07/2016	11:00	13:05	SPIN	1	10 - 20	12	20
13	638943	5058886	19/07/2016	11:30	13:35	SPIN	1	20 - 29	19	26
14	639356	5058848	19/07/2016	11:45	13:48	SPIN	1	6 -10	6	7
15	639264	5058947	19/07/2016	12:30	14:33	SPIN	1	10 - 20	11	14
16	639054	5058713	19/07/2016	12:50	14:50	SPIN	1	6 -10	5	11
17	639311	5058554	20/07/2016	9:55	11:55	SPIN	1	6 -10	7	8
18	639831	5058646	20/07/2016	10:15	12:30	SPIN	1	6 -10	5	10
19	639504	5058698	20/07/2016	10:35	12:40	SPIN	1	10 - 20	10	13
20	639567	5058618	20/07/2016	10:55	13:00	SPIN	1	10 - 20	13	14
21	638198	5058349	20/07/2016	11:15	13:25	SPIN	1	10 - 20	14	17
22	639494	5058352	20/07/2016	11:35	13:35	SPIN	1	20 - 29	26	28
23	638217	5058936	20/07/2016	12:20	14:20	SPIN	1	6 -10	6	9
24	638396	5058647	20/07/2016	12:55	14:55	SPIN	1	20 - 29	24	24

Table 3 Catch summary, Loon Lake, 2016.

Species	BsM sm	BsM lg	SPIN	Total
Brown Bullhead (233)	1	0	0	1
Common Shiner (198)	21	0	0	21
Lake Chub (185)	1			
Golden Shiner (194)	4	0	0	4
Lake Trout (81)	1	0	8	9
Pumpkinseed (313)	1	0	0	1
Rainbow Smelt (121)	122	0	1	123
Round Whitefish (102)	1	0	1	2
Smallmouth Bass (316)	15	0	27	42
White Sucker (163)	7	1	46	53
Yellow Perch (331)	32	0	0	32
Total	205	1	83	288

Table 4 Small-mesh Broad-Scale Monitoring net set details, Loon Lake, 2016.

Effort	Easting	Northing	Set Date	Set Time	Lift Date	Lift Time	Total Gangs	Stratum	Depth Start (m)	Depth End (m)
1	637750	5057949	17/07/2016	15:21	18/07/2016	9:30	2	0 - 3	2	3
2	638152	5058688	17/07/2016	15:30	18/07/2016	10:40	1	3 - 6	4	5
3	638197	5058447	17/07/2016	15:40	18/07/2016	11:00	1	20 - 29	21	24
4	637903	5059304	17/07/2016	15:50	18/07/2016	11:30	1	12 - 20	13	15
5	638196	5058909	18/07/2016	15:25	19/07/2016	9:25	1	6 - 12	6	9
6	638402	5059246	18/07/2016	15:35	19/07/2016	10:07	1	3 - 6	4	5
7	638918	5059019	18/07/2016	15:45	19/07/2016	10:34	1	0 - 3	2	3
8	639049	5058776	18/07/2016	16:00	19/07/2016	11:06	1	20 - 29	20	24
9	639607	5058568	19/07/2016	14:20	20/07/2016	9:22	1	12 - 20	13	14
10	639426	5058759	19/07/2016	14:45	20/07/2016	9:37	1	6 - 12	6	7
11	639606	5058933	19/07/2016	15:15	20/07/2016	10:00	1	3 - 6	3	6
12	639584	5058231	19/07/2016	15:30	20/07/2016	10:25	2	0 - 3	2	3

The catch summary for BsM efforts is as follows: 1 Brown Bullhead, 21 Common Shiner, 4 Golden Shiner, 1 Lake Chub, 1 Lake Trout, 1 Pumpkinseed, 122 Rainbow Smelt, 1 Round Whitefish, 15 Smallmouth Bass, 7 White Sucker, and 32 Yellow Perch (Table 3). Pumpkinseed, Lake Chub and Golden Shiner had not previously been documented.

The catch rate of Lake Trout from the SPIN sets was calculated as the area-weighted, selectivity corrected catch per net. The catch rate was 0.4/net (Appendix). Application of the large-bodied conversion resulted in an estimated density of 1.5 fish/ha or 173 (68% C.I.: 0-374) fish.

Of the nine Lake Trout captured all except one had no clip on capture. One had a left pectoral clip indicating that it had been stocked in 2005 and was 12 years old (Table 5).

The Lake Trout population was dominated by adult-sized fish, greater than 550 mm fork length. Fork lengths ranged from 490 mm to 665 mm with an average of 602 mm (Figure 3). There was no representation of smaller trout.

Table 5 Summary of Lake Trout caught in Loon Lake, July 18-20, 2016.

Fish #	Gear	Fork Length (mm)	Total Length (mm)	Round Weight (g)	Fin Clip	Fate	Sex	Gonad Cond	Stom	Age
1	BsM sm	650		3800	0	R				8
2	SPIN	665	725	3600	0	R				13
3	SPIN	590	633	2650	LP	R				12
4	SPIN	665		3450	0	D	F	23	2	18
5	SPIN	600	665	3300	0	R				7
6	SPIN	560	611	2300	0	D	F	23	2	9
7	SPIN	610	660	3050	0	R				12
8	SPIN	490	540	1500	0	R				9
9	SPIN	590	652	2650	0	R				12

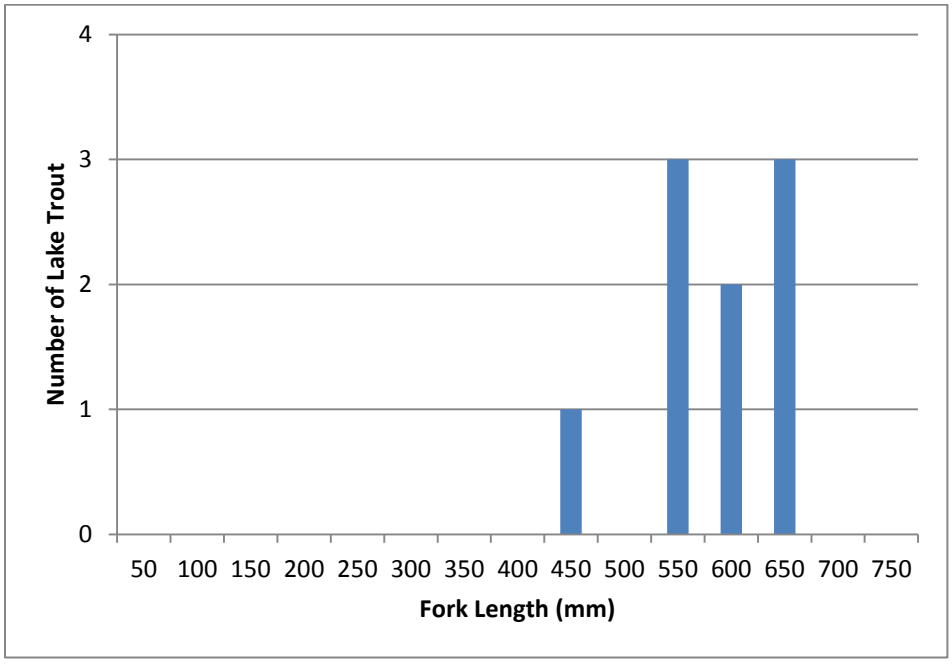


Figure 3 Size distribution (labelled at lower limit) of Lake Trout caught in Loon Lake during 2016 survey.

Evening spawning observations occurred on October 25, 26 and 30, 2016 (Table 6). Surface water temperatures were 10, 9 and 8.5^{o}C, respectively. The water level on Oct 26, 2016 was 0.75 m (local datum) having declined from 0.95 m on Oct 12. The operating plan calls for the target drawdown level of 0.64 m by Oct 15 with a normal operating zone of 0.44 to 0.79 m. The areas visited varied between the three evenings but all the main or high probability areas were visited at least two times. On the first evening 7 Lake Trout were observed at the known spawning shoal on Grass Lake, while on the last evening approximately 50 were seen. These observations confirmed that the window for observations was appropriate.

On Loon Lake, on Oct 25, Lake Trout were observed only in the narrows (2 fish) and the nearby island (1 fish). On Oct 26, three Lake Trout were observed at the west end of the narrows (main narrows not visited), 7 Lake Trout at 6 scattered locations and 6 Lake Trout at a previously un-identified shoal in the north arm (Site 25). Finally, on Oct 30 three Lake Trout were observed at Site 25 and what were believed to be Lake Trout eggs at a second nearby new location, Site 24. Fewer fish were in the narrows on the last night (2 at the east end) and none at other sites.

Table 6 Summary of Lake Trout spawning observations, Loon Lake, 2016.

Date:	25-Oct-16	26-Oct-16	30-Oct-16	
Time:	19:00-21:45	20:00-22:23	18:30-21:15	
Water Temp.:	10.0	9.0	8.5	
Site	Number of Fish Observed			Comment
1	0	0	0	
2	0	0	0	
3				
4	0	1 LT	0	
5	0	0	0	
6	0	1	0	
7		0		
8		0	0	
9		0	0	
10		1 LT	0	
11		2 LT	0	
12B	0	3 LT, 2 RWF, 3 WS	4 RWF	
13	0	0		
14	0	0		
15	0	1	0	
16	1 RWF		0	
17				
18				
19				
20				
21	0	0		
22	0			
23	0		0	
24	0		LT eggs, 2 WS	638210, 5059352
25	0	6 LT	3 LT, 1 RWF, 1 WS	638340, 5059212
Launch		1		
Narrows	2 LT			
East end of Narrows Island near Narrows	1 LT		2 LT, 2 RWF	
Grass Lake Is.	7 LT (west end)		50 LT, 2 RWF	

LT: Lake Trout, RWF: Round Whitefish, WS: White Sucker
Blank cell indicates site was not visited

Discussion

The SPIN protocol is designed to produce estimates of the abundance of catchable (> 300 mm FL) Lake Trout. The catch rate (number of fish caught per net set) is an indication of relative abundance and can be converted to absolute abundance (number or density of fish) using relationships developed for the protocol. The amount of netting effort expended provided an approximate estimate of abundance which is sufficient for management purposes. Because of the variability of catch, many more nets sets would be required to obtain a highly precise estimate of the Lake Trout population size. Overall the abundance of Lake Trout is relatively low.

The small mesh gill nets are designed to detect the presence of species, particularly small-bodied species not normally caught in targeted sport fish population assessments. Three species not previously recorded for the lake were caught, Pumpkinseed, Lake Chub and Golden Shiner. All are common species that are probably native to the lake.

This was the first assessment in which Rainbow Smelt were caught. They were caught in large numbers confirming their previously reported presence and giving an indication of their abundance. A local resident suggested that smelt had emigrated from Sand Lake, which is downstream of Loon Lake. However the large elevation difference between the lakes (~34 m) including natural falls and the dam make it extremely unlikely that they could have colonized the lake without human assistance. Smelt may impact the trout population in two ways. In some circumstances reproduction of trout is impaired through predation on and competition for resources with the young. However, smelt are a food source for larger trout and can contribute to faster growth and larger ultimate size.

Only two Round Whitefish were caught, one in each gear. In 2004, large numbers of Round Whitefish were caught in the SLIN survey (Table 7). The SLIN protocol is different from SPIN and includes more length of net of mesh sizes to which Round Whitefish are vulnerable. However, the capture of only two in 2016 suggests there has been a major decline in the Round Whitefish population. It has been speculated that the high Round Whitefish density may negatively impact Lake trout through competition for food, especially amongst young trout, however, like smelt, whitefish are also a food source for trout. Rainbow Smelt have also been documented to impact recruitment of Lake Whitefish (and presumably Round Whitefish) in some situations. Overall, smelt might impact reproduction of Lake Trout and Round whitefish, but a reduction of Round Whitefish might actually benefit Lake Trout by reducing competition, possibly off-setting direct impacts of smelt on Lake Trout.

Being a relatively new member of the fish community, it will take more time to observe what the long term impact of smelt will be on both Lake Trout and Round Whitefish. It will be difficult to describe the dynamics between the three species given the infrequency of assessments and difficulty of detecting causal relationships. Overall, it is expected that smelt will have a detrimental effect on the Lake Trout and Round whitefish populations.

No very small Lake Trout were caught in either the SPIN or small mesh nets, which might suggest that reproduction is poor (and possibly impacted by smelt). However, the selectivity of the SPIN gear for larger fish and the small sample size of captured trout make it questionable to make a conclusion on the strength of reproduction based on the netting results. Younger fish were caught in previous assessments in 1982 and 2004 (Table 8, Figure 4).

Table 7 Catch summary, Spring Littoral Index Netting, Loon Lake, 2004.

	Round Whitefish	Lake Trout	White Sucker	Yellow Perch
Net Sets	30	30	30	30
Total Catch	263	10	5	10
Mean	8.8	0.3	0.2	0.3
St. Dev.	10.5	0.7	0.4	0.8
Min.	0	0	0	0
Max.	37	3	1	3
p of capture	0.90	0.23	0.17	0.20

The fall observations confirmed that spawning activity is taking place in Loon Lake. Although the netting didn't confirm the presence of very young fish it is very likely that at least some natural recruitment is occurring in Loon Lake, based on the amount and quality of deep water habitat. The number of fish observed in Loon Lake was much smaller than was observed in Grass Lake. That is expected as the amount of quality deep water nursery habitat is considerably higher in Grass Lake.

Table 8 Individual fish details for Lake Trout, Loon Lake, SLIN, 2004.

Sample	Fish	Fork Length (mm)	Total Length (mm)	Round Weight (g)	Age	Fin Clip
1	1	496	450	875	7	
5	2	456	411	725	6	
5	3	585	532	1750	13	LP
5	4	517	472	1000	8	
10	5	437	399	610	7	
11	6	389	355	405	4	
21	7	724	660	3650	18	RV
21	8	473	430	850	8	
26	9	562	512		7	
27	10	503	459	960	11	

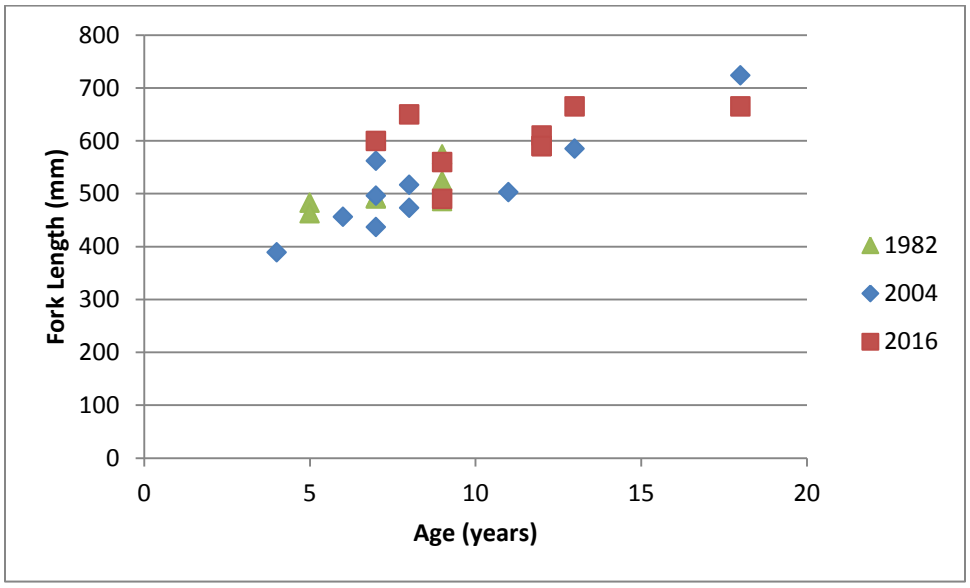


Figure 4 Plot of size (fork length) at age for Lake Trout captured in Loon Lake, 1982, 2004 and 2016.

The spawning observations provide a strong indication that successful natural reproduction is occurring in Loon Lake. Although numerous sites had been identified to have suitable substrate, most were observed to be of poor quality due to combinations of particle size, bed thickness and wind exposure. The newly-identified offshore shoals are excellent candidates for enhancement due to their proximity to deep water and location remote from competing shoreline uses. The lake association should be contacted to determine if they are interested in undertaking a project.

At the time of the survey some suitable spawning substrate on Grass Lake was dewatered while very little was exposed on Loon lake. More work would be required to assess the impact or benefit of the drawdown. At the very least if the draw down continues it should be achieved completely before spawning begins.

At the time of netting, most of the area in and below the thermocline was useable by Lake Trout. However, as summer progresses dissolved oxygen levels decline due to respiration and are not replenished until the thermal stratification breaks down in the fall. The late summer dissolved oxygen level (expressed as the mean volume-weighted hypolimnetic dissolved oxygen (MVWHDO) concentration) is a good indicator of the quality of the deep water habitat. At levels of 7 ppm and higher, a

lake should be fully capable of supporting a natural population with the capability declining progressively, below 7 ppm. The long term average for Loon Lake is 6.2 ppm, indicating that the lake is capable of supporting a moderate amount of natural reproduction.

The combination of useable habitat volume and quality place Loon Lake in the middle of the range of lakes in Parry Sound District (Figure 5). Most lakes that are stocked have less or poorer habitat (the cluster of lakes with more habitat have low water clarity), whereas there are also many lakes that are managed as natural lakes that have similar or worse habitat than Loon Lake. Overall, Loon Lake appears capable of being managed as a natural Lake Trout population but the quality of the fishery will be poorer than if the lake is stocked. As interference by stocked fish can impact natural reproduction stocking is generally not done when a lake is capable of supporting a natural population. Stocking in such a situation may be rationalized if done on a strategic basis such as due to high economic value of the fishery, diverting pressure from other lakes or providing an alternate fishery in favour of protecting higher quality natural lakes. Grass Lake supports a larger natural population and is a higher priority for protection than Loon Lake, but there are also alternate Lake Trout fishing opportunities nearby. Overall, Loon Lake appears capable of supporting a natural population and there isn't compelling need to stock it strategically; therefore the current management approach of suspending stocking and continuing to monitor the lake is recommended. The impacts of the changes to the fish community observed in this assessment will take more time to be fully manifested. It would be premature to change the formal designation from PGT to natural until the long term impact and management direction is confirmed.

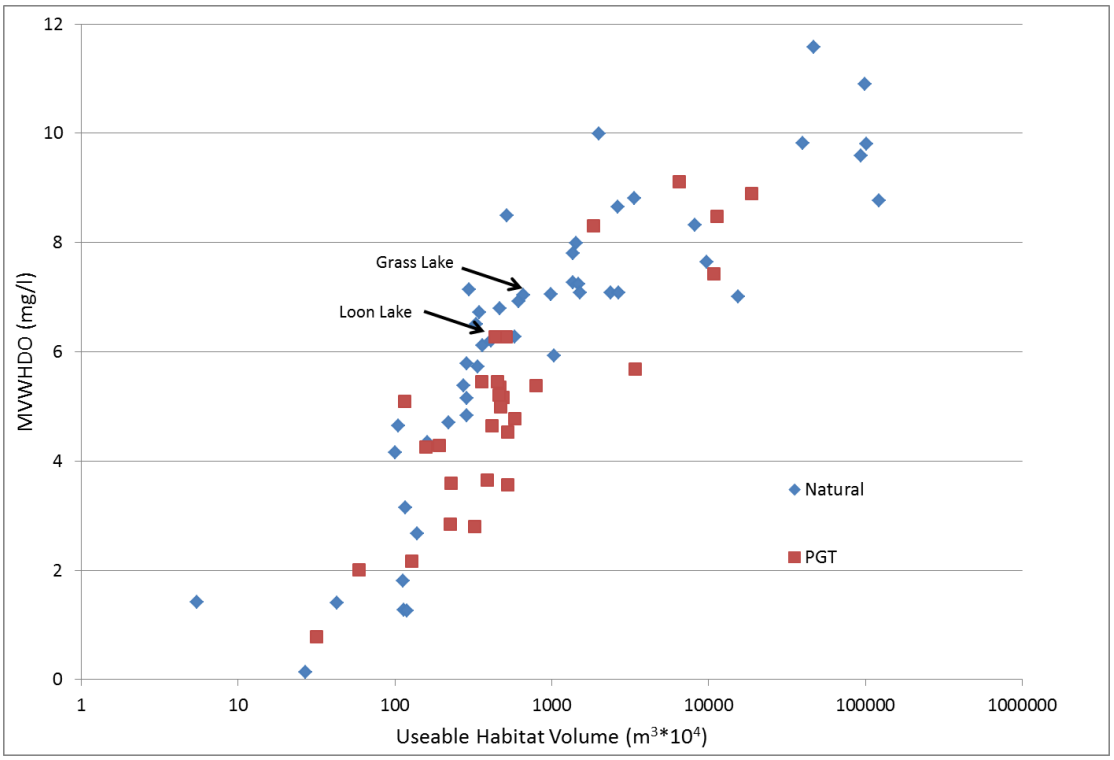


Figure 5 Plot of average late summer useable habitat volume and dissolved oxygen level, by management designation, for Lake Trout Lakes in Parry Sound District.

This survey did not address the still outstanding question of whether, or how much, movement of Lake Trout there is between Loon and Grass Lake. The observation of trout in the narrows suggests that there is some. The amount of movement and its' nature (incidental, net direction, etc.) could only be determined with a much more detailed study. The likelihood of some movement indicates that the two lakes should be managed together and therefore is further impetus for continuing to manage Loon Lake for natural reproduction.

In summary, the Lake Trout population of Loon Lake is at a relatively low level of abundance but supporting itself through natural reproduction. Loon Lake provides fair habitat for Lake Trout due to an adequate supply of late summer hypolimnetic dissolved oxygen, however the volume of deep water nursery habitat is limiting. The low abundance is probably a result of the habitat quality in combination with interactions with other fish species including illegally introduced Rainbow Smelt. Options are to manage for a self-sustaining population and accept the low abundance as the natural capacity of the lake to support trout. Or, alternatively, given the low abundance and low potential for major improvement naturally the lake could be stocked on a put-grow-take basis. It is recommended that the lake continue to not be stocked and monitoring be continued. Enhancement of the newly identified shoals 24 and/or 25 should be considered to ensure that spawning habitat is not limiting the productive potential of the population.

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Appendix

SUMMER PROFUNDAL INDEX NETTING REPORT

Lake: Loon Lake | Office: BB Area | Secchi: | TDS: | Phosphorus: | Linf: | GDD: | Xfield 1:

Date: 2016 (Year) (Month) | Total Area: 152 | Sampled Area: 117 | Max Depth: 29 | Mean Depth: | Lmat: | Z: | Xfield 2:

Using Large Body Conversion

Area Wt. Selectivity Adj Values	Total Catch	Arith CUE	SE CUE	RSE CUE	Density (ha)	Pop Est	Low Est	Upper Est	Pred. Level
Lake Trout >=300 and <=1500mm	8	0.40	0.13	0.33	1.5	173	0	374	68%

Stratum Info	Sites #	Total # Nets	% Sites	% Samp Area	Tot Catch #	Tot Catch %	Mean CUE	SE CUE	RSE CUE	Mean FLEN	SE FLEN
Stratum 1 (5-10m)	6	6	30%	36%	1	12%	0.17	0.17	1.00	665	0.00
Stratum 2 (10-20m)	10	10	50%	47%	6	73%	0.61	0.10	0.17	607	15.33
Stratum 3 (20-30m)	4	4	20%	17%	1	14%	0.30	0.30	1.00	490	0.00
Stratum 4 (30-40m)	0	0			0						
Stratum 5 (40-60m)	0	0			0						
Stratum 6 (60-80m)	0	0			0						
Stratum 7 (80+m)	0	0			0						
Total	20	20	100%	100%	8	100%	0.40	0.13	0.33	608	7.21
				actual	8						

Total Biomass >300mm: 3.74 kg/ha sampled

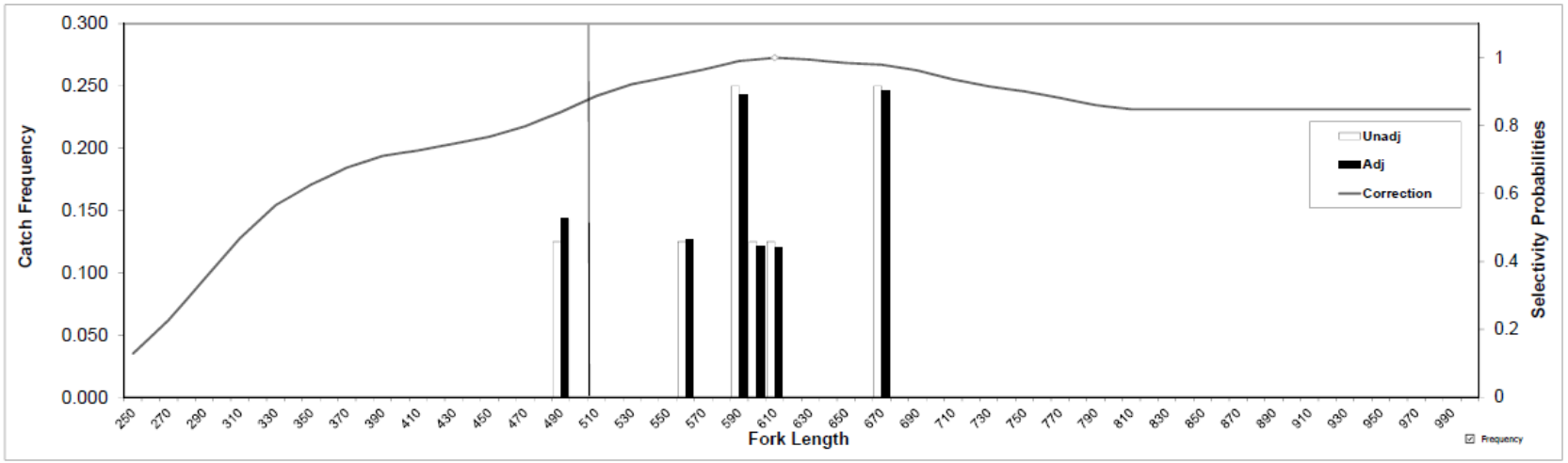
avg wt of a fish: 2.53 kg

Previous Arith Mean:
Previous Arith Stdev:
Previous n=
p-Value:
Previous Mean,Stdev, n= not specified

Power Observed: 29%

Power Desired: 80%
Change Detectable: 25%
Sets Required (n=): 161

Thermocline(top): n/a m
Thermocline(bottom): 0 m



Selectivity Model
- no correction
- 1_Pakohelmo
- gamma
- S_Walker (use this)
- bi-modal

density relationship available

% zero S1	83%
% zero S2	50%
% zero S3	75%
% zero S4	
% zero S5	
% zero S6	
% zero S7	
Area Wt % zero	66%

No. of Sets Next Day	
Stratum 1	1
Stratum 2	6
Stratum 3	1
Stratum 4	
Stratum 5	
Stratum 6	
Stratum 7	

Report generated with ver. 9.07

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