Lake Trout Stocking Assessment

Crane Lake

2015

File Report

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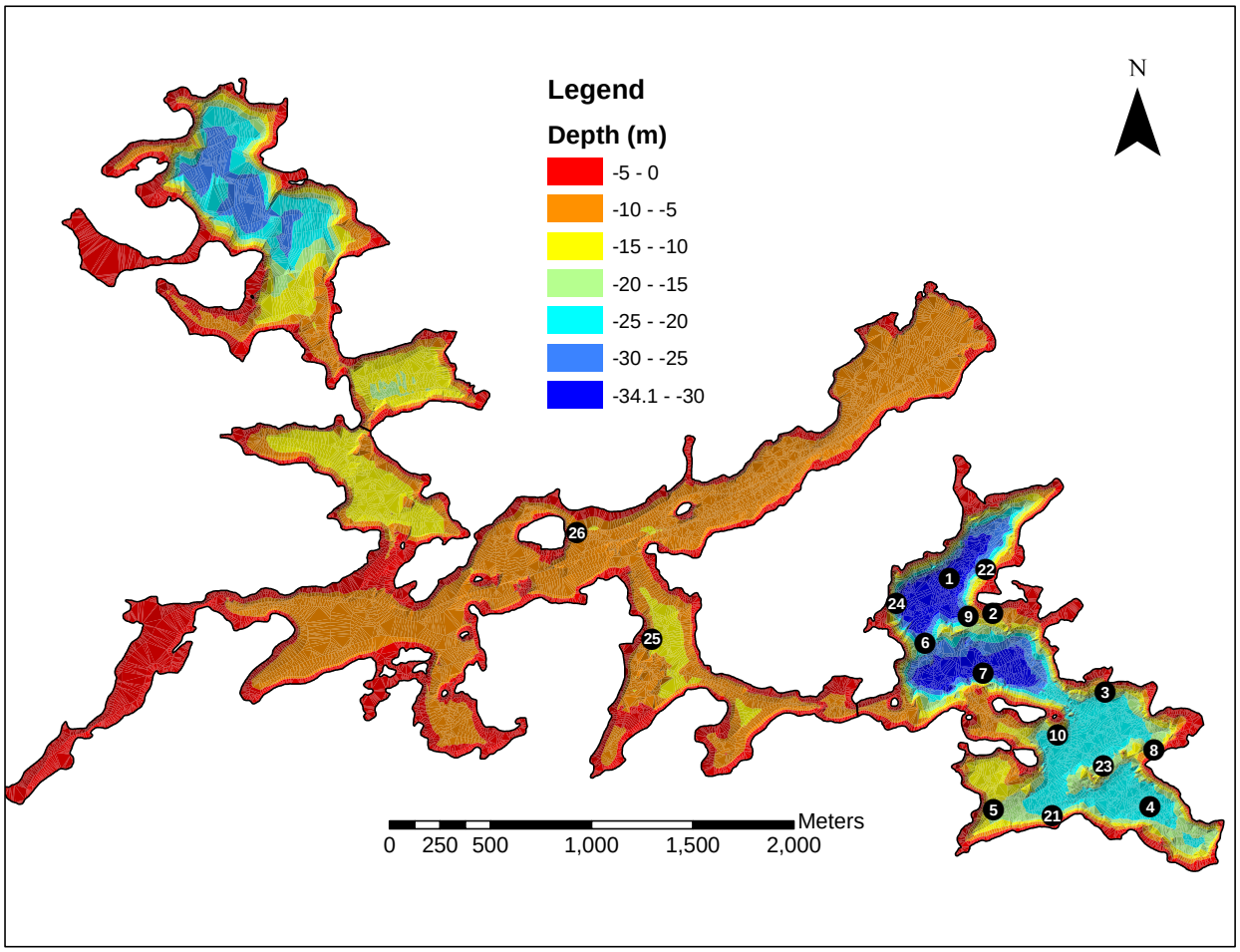
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Crane Lake is a moderately large lake (513 ha) located just south of the Town of Parry Sound within MNRF's Parry Sound administrative district. It contains two deep basins capable of supporting Lake Trout, one in the southeast portion of the lake (max. 32 m), and another at the end of the northwest arm (max. 28 m) (Figure 1); but they are widely separated by about 4 km where the water is generally less than 10 m deep and it is speculated that Lake Trout only live there seasonally. McIntyre (2005) provided a history and summary of the water chemistry and fish community of the lake and an assessment of the cool/warm water fish community.

Figure 1 Map of Crane Lake showing bathymetry and net set locations, 2015.



Lake Trout were not native to Crane Lake (Thurston 1981). Stocking on a put-grow-take basis began in 1972 and has continued to the present (Table 1). Stocking has been generally done every second year with yearlings, with a reduced frequency during the 1980s.

Thurston (1976) assessed the lake in 1976, captured 13 Lake Trout and concluded that the success of the Lake Trout stocking program was less than satisfactory and would require further evaluation. It was re-assessed the following year and 15 overnight gill net sets yielded no Lake Trout (Thurston 1977). It was speculated that stocked trout were moving from Crane to Blackstone Lake and it was recommended that stocking be continued, alternating with years when Blackstone Lake was stocked to try to determine if the hypothesis was correct. The alternate year stocking occurred in 1978-79 following which no stocking

occurred for several years. When stocking was resumed in 1987, it was done the same year as Blackstone and the lakes were stocked on the same cycle until 2015.

The most recent assessment of the Lake Trout population occurred in 1989 (Deary 1990). Seven Lake Trout were caught in 17 overnight sets; all were stocked fish. All, but one, were from the recent 1987 stocking event. Stocking did not occur between 1979 and 1987 so the assessment provided little insight into survival or abundance of catchable-sized fish. All Lake Trout were caught in the southeast basin despite half of the netting effort occurring in the northwest basin; however, it isn't known where fish were stocked in 1987. No specific recommendations were made and stocking was continued.

Table 1 Lake Trout stocking history, Crane Lake.

Year	Age	Number	Mean Weight (g)	Clip	Strain	Location
1972	Yearling	15,000			Lake Manitou	
1973	Yearling	12,000			SK	
1974	Yearling	10,000		LV	Lake Manitou	
1976	Two-year-old	3,000	80	AD	Lake Manitou	
1979	Yearling	5,000	6	LV	SP	
1987	Yearling	3,150	13	RV	Lake Manitou	
1991	Yearling	2,500		RP	Lake Manitou	
1993	Yearling	1,800	14	AD		
1995	Yearling	2,500	20	LP		
1997	Yearling	2,500	14	RV	Killala Lake	
1999	Yearling	2,500	20	LV	Killala Lake	
2001	Yearling	2,500	20	RP	Killala Lake	
2003	Yearling	2,500	20	AD	Killala Lake	
2005	Yearling	2,000	17	LP	Killala Lake	
2007	Yearling	2,000	21	RV	Killala Lake	
2010	Yearling	1,897	61	AD	Big Sound	
2011	Yearling	2,000	20	RP	Killala Lake	
2013	Yearling	2,000	22	AD	Lake Manitou	
2015	Yearling	1,500	30	LP	Lake Manitou	
2016	Yearling	1,000	25	RP	Lake Manitou	SE basin: 500 NW basin: 500
2018	Yearling	1,500	22	AD	Lake Manitou	SE basin: 750 NW basin: 750

Information on the fishery for stocked Lake Trout is lacking. The deepwater habitat occurs in widely separated basins within a much larger lake which may result in a poor fishery when the lake is not thermally stratified as fish are able to disperse throughout the lake. The availability of other Lake Trout fishing opportunities nearby may result in anglers choosing to fish elsewhere as a consequence. The absence of general knowledge by District staff of a fishery on a particular lake is often a good indicator that the fishery is small and/or poor suggesting that stocking of Crane Lake was not achieving its' implicit objective and that stocking should be re-considered. Given that it had been 25 years since the last assessment it seemed prudent to collect current information on the Lake Trout population to support a decision on whether stocking should continue.

Methods

The Summer Profundal Index Netting (SPIN) protocol was used during the assessment (Table 2, Sandstrom and Lester 2009), SPIN gear consists of monofilament gill nets that are 64 meters long, 1.8 meters high and consist of 8 panels, made up of a variety of mesh sizes.

The protocol has two options for setting nets; daytime sets of 2 hours duration and over-night sets. Both were used in this assessment. Nets are allocated to depth strata proportional to their area.

Captured Lake Trout were measured (FL and TL), weighed, examined for fin clips and had ageing structures collected. Non-target species were measured for fork length only. Fish were live-released when possible.

A GPS depth sounder was used to collect bathymetry data, and temperature and dissolved oxygen profiles were collected in the deep basins.

Table 2 Summary of SPIN protocol (Sandstrom and Lester 2009).

Parameter	Criteria
Season	Surface water greater than 18^{o} C
Set Durations	SPIN(L2) two hour (min); two hours twenty minutes (max)
	SPIN(L18) eighteen hours (min); twenty hours (max)
Gear Length	64m (8 mesh sizes x 8 m panels)
Mesh Series	2.25, 2.50, 2.75, 3.0, 3.5, 4.0, 4.5, 5.0 (stretch inch)
Set Orientation	Random
Depth	7 Strata (2-10m, 10-20m, 20-30m, 30-40m, 40-60m, 60-80m, 80+m)
Spatial Stratification	Effort equally distributed over entire lake
No. Samples per Lake	No. of Sets SPIN(L2) = 0.0184(Area >10m, ha) + 24 (max. 140)
	Minimum of three sets in non-core stratum and five in core stratum (10-40m)
No. Sets per Day	6, 9 or 12 sets
Target Biological Sample	n = 75+ lake trout
Overall Target CUE	Relative Standard Error = 0.15

Results and Discussion

Netting occurred on July 16-17, 2015. Netting was confined primarily to the southeast basin (Figure 1). The lake was stratified with a well-defined thermocline occurring from 4 to 8 m deep (Table 3). Dissolved oxygen levels were not measured, but based on past profiles collected in late summer, it was assumed that useable Lake Trout habitat occurred to the deepest point. Ten standard short-duration (2-hour) SPIN nets were set on the first day, followed by six nets set over-night (Table 4); two of the over-night sets were placed in the main lake to explore the possibility of Lake Trout occurring away from the deep basins. The daytime sets ranged from 5 to 31 m deep, with one set less than 10 m deep, four sets in the 10-20 m stratum, three sets between 20-30 m and two sets deeper than 30 m. Overnight sets were in a similar depth range but several nets were set across stratum boundaries to sample as much different habitat as possible with a small number of nets.

Daytime sets yielded only four Smallmouth Bass, resulting in the decision to use overnight sets (Table 5).

Overnight sets caught Lake Trout (3), Cisco (2), Northern Pike (3), Muskellunge (1), Burbot (3) and Smallmouth Bass (21). All of the Lake Trout were caught in the deep basin.

The Lake Trout were all large individuals, ranging from 556 to 699 mm FL and 2.5 to 5.5 kg in weight (Table 6). Ages of all fish could not be determined with certainty from fin clips due to the potential for fish from two different fin clipping cycles being present. The smallest fish was 11 years old and the larger fish could have been between 9 and 23 years old. It could not be determined whether the fish caught had been stocked in Crane Lake or in Blackstone Lake due to stocking being done in the same years since 1991.

The measurements of other captured fish are found in Table 7.

Table 3 Temperature profile, Crane Lake, July 16, 2015. Location UTM NAD83 585861, 5006837.

Depth (m)	Temp (°C)
0	23.2
1	23.0
2	22.9
3	22.8
4	22.7
5	16.6
6	11.2
7	7.8
8	6.1
9	5.4
10	4.9
12	4.6
14	4.4
16	4.3
18	4.2
20	4.1

Table 4 Net set summary, Crane Lake 2015. All sets used single-gang, standard SPIN nets.

Set	Easting	Northing	Set Date	Set Time	Lift Date	Lift Time	Start Depth (m)	Mid Depth (m)	End Depth (m)
1	585899	5006917	07/16/2015	10:00	07/16/2015	12:00	32	33	34
2	586115	5006744	07/16/2015	10:20	07/16/2015	12:20	5	9	9
3	586670	5006357	07/16/2015	10:40	07/16/2015	12:40	10	16	21
4	586892	5005789	07/16/2015	11:00	07/16/2015	13:00	22	23	23
5	586117	5005773	07/16/2015	11:20	07/16/2015	13:20	10	15	17
6	585779	5006600	07/16/2015	11:40	07/16/2015	13:40	22	25	27
7	586067	5006451	07/16/2015	12:15	07/16/2015	14:15	31	31	31
8	586911	5006068	07/16/2015	12:35	07/16/2015	14:35	10	10	9
9	585993	5006732	07/16/2015	12:55	07/16/2015	14:55	10	16	22
10	586435	5006142	07/16/2015	13:15	07/16/2015	15:15	20	20	21
21	586408	5005745	07/16/2015	14:55	07/17/2015	9:45	8	15	21
22	586080	5006964	07/16/2015	15:10	07/17/2015	10:25	6	15	24
23	586662	5005990	07/16/2015	15:25	07/17/2015	9:55	12	7	10
24	585638	5006795	07/16/2015	15:45	07/17/2015	10:46	5	20	33
25	584428	5006619	07/16/2015	15:55	07/17/2015	11:26	6	10	11
26	584057	5007145	07/16/2015	16:00	07/17/2015	11:45	9	9	9

The amount of netting effort used in this survey was sufficient to provide a crude estimate of the abundance of Lake Trout in the southeast basin. Much more effort would have been required to sample the northwest basin and other areas of the lake as well and to obtain more precise estimates of abundance or obtain a large enough sample of measured fish to make inferences about the population structure. We didn't have the resources to commit that level of effort to this survey. Even if more sampling was done, the potential movement of fish between Crane and Blackstone Lakes and our inability to determine the origin of fish would have confounded interpretation anyway.

Table 5 Catch summary, Crane Lake, 2015.

Set	Lake Trout	Northern Pike	Smallmouth bass	Muskellunge	Cisco	Burbot
1						
2			1			
3						
4						
5						
6						
7						
8			3			
9						
10						
21						
22	1		5		1	1
23	1		1	1	1	
24	1	1	4			1
25			4			1
26		2	7			
	3	3	25	1	2	3

Table 6 Biological attributes of captured Lake Trout, Crane Lake, 2015.

Effort	Fish	FL	TL	RWT	Sex	Gonad	Clip	Age
22	8	556	615	2545	2	22	LP	11
23	2	620	684	3550	2	22	RV	9 or 19
24	6	699	754	5500	2	22	AD	13 or 23

The catch of no Lake Trout in ten standard daytime sets and only three in targeted overnight sets indicates that the abundance of Lake Trout in the southeast basin is low. The large size and old age suggest the survival is poor and/or emigration is occurring, though the sample size is very limited.

The habitat in the two deep basins appears to be good for Lake Trout. Late summer dissolved oxygen levels and water clarity are relatively high (Table 8); high enough to make one wonder why the lake did not support a native Lake Trout population. Blackstone Lake is in the same situation, suggesting there is a common cause. The deep basins appear to be capable of supporting relatively high densities of stocked Lake Trout. The current number of fish stocked (1,500/event) is somewhat less than the 2,100 calculated as the recommended rate by the provincial stocking guidelines (20/ha of water >15 m). The number

stocked could be increased accordingly to try to improve abundance, even though it doesn't seem likely that the number stocked is the major reason for the observed low catch rate.

The locations at which Lake Trout have been stocked have not been reliably recorded for some past events. Because the deep water habitat is in discrete basins, it is important that Lake Trout be stocked directly in them to maximize survival; fish stocked away from these basins, such as near the public access may not be able to find the deep basins when the lake becomes thermally stratified and would be exposed to many predators in the process. All future stocking should be directly into the deep basins and the locations be recorded.

Table 7 Biological attributes of other species, Crane Lake, 2015.

Effort	Species	Fish	Fate	FLEN	TLEN	RWT
22	Cisco	4	D	295		
23	Cisco	4	D	290		
24	Northern Pike	5	D	702	735	2760
26	Northern Pike	8	R	613		
26	Northern Pike	9	D	706	756	2500
23	Muskellunge	1	R	1180		
22	Burbot	5	D	511		
24	Burbot	1	R	362		
25	Burbot	5	D	327		
2	Smallmouth Bass	1		231		
8	Smallmouth Bass	1		287		
8	Smallmouth Bass	2		344		
8	Smallmouth Bass	3		347		
22	Smallmouth Bass	1	R	367		
22	Smallmouth Bass	2	R	269		
22	Smallmouth Bass	3	R	255		
22	Smallmouth Bass	6	R	355		
22	Smallmouth Bass	7	D	384		
23	Smallmouth Bass	3	D	237		
24	Smallmouth Bass	2	R	288		
24	Smallmouth Bass	3	R	305		
24	Smallmouth Bass	4	R	292		
24	Smallmouth Bass	7	D	255		
25	Smallmouth Bass	1	R	223		
25	Smallmouth Bass	2	D	275		
25	Smallmouth Bass	3	D	287		
25	Smallmouth Bass	4	D	277		
26	Smallmouth Bass	1	D	539		
26	Smallmouth Bass	2	D	324		
26	Smallmouth Bass	3	D	293		
26	Smallmouth Bass	4	D	275		
26	Smallmouth Bass	5	R	498		
26	Smallmouth Bass	6	D	266		
26	Smallmouth Bass	7	D	258		

Table 8 Summary of late summer Lake Trout habitat characteristics, Crane Lake.

Basin	MVWHDO (mg/l)	Useable Habitat (%)	Optimal Habitat (%)	Secchi Depth (m)
Southeast	8.8	57	52	5.1
Northwest	7.3	42	35	5.0

The inability to distinguish which lake re-captured fish were originally stocked into seriously hinders our ability to interpret sampling results. As recommended by Thurston (1977), stocking should be staggered on alternate years between Crane and Blackstone Lakes to facilitate that in the future. Future assessments should entail sampling of both lakes concurrently as well.

The value of continued stocking of Lake Trout into Crane lake is very questionable. Quality habitat exists but it comprises a small portion of the lake. When the lake is not thermally stratified, angling success might be poor as fish can disperse outside of the summer habitat. No information is available on the summer fishery to indicate how much effort is occurring during the stratified period and the quality of the fishery. Blackstone Lake can be accessed directly from Crane Lake, provides more Lake Trout habitat and it is likely that at least some anglers seeking Lake Trout fishing opportunities are travelling there instead of fishing in Crane Lake. Informal observations indicate that much more winter effort occurs on Blackstone than on Crane.

Non-native Rainbow Smelt occur in Crane. In some lakes, interactions with smelt can seriously impact the reproductive success of some species, including Cisco and Walleye, which occur in Crane Lake. The effect varies by species and other confounding factors, especially water clarity. Trout and Cisco seem to be most affected when water clarity is low and, conversely, Walleye are when the water clarity is high. Smelt have been implicated in a historic decline in the Walleye population in Crane Lake though other factors may have played a role as well. We don't know what the current abundance or impact of smelt is, but it is possible that stocking of Lake Trout could have value in suppressing them, to the benefit of other species. The effect is not likely occurring at the existing low level of Lake Trout abundance. It could be a consideration in a deciding whether stocking should be continued.

Overall, this assessment determined that the abundance of Lake Trout in the southeast basin of Crane Lake is currently low suggesting that stocking is not achieving its desired purpose. Uncertainty concerning the movement fish between Blackstone Lake, the possible ecological value of stocking and lack of information on the nature of the fishery make it difficult to make definitive management recommendations. Stocking should only be continued if there is some prospect of gathering information on the fishery and/or conducting a population assessment of Crane and Blackstone Lake concurrently.

References

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