Rainbow Trout Stocking Assessment

Clayton Lake

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Clayton Lake is a small (12 ha), moderately deep (Z_{max}.: 8m, Z_{mean}: 3m) lake located in Livingstone Township. The water is very clear (secchi: 6-7 m) and the lake does not thermally stratify. The lake is located entirely on Crown Land; there are no cottages or development on the shore line other than two campsites. It is directly accessible by vehicle from a summer-maintained municipal road (Bear Lake Road); 17.5 km northeast of Dorset. A 911 sign marks the trail leading down towards the lake.

The lake was first inventoried in 1959. Twenty-three brook trout were caught ranging from 15 to 45 cm in length. No observations were made of whether any of the fish caught were naturally occurring. Stocking began in 1949 and occurred regularly until the time of the survey. Northern red-bellied dace were also caught in this survey.

A lake survey was completed in 1971. Again a large number of brook trout were caught (17), ranging from 25 to 40 cm, and it was concluded that they were of natural origin due to the absence of fin clips. The 1969 planting was recorded as having fin clips, however it wasn't recorded whether earlier plantings were marked, therefore the conclusion that all the fish were naturally reproduced is questionable.

A follow up survey in 1973 caught only three brook trout. As stocking had not occurred since 1969, the lower catch possibly suggests that the fish caught in 1971 and 1973 were primarily hatchery fish, though the amount of netting effort was too low to be confident in this conclusion.

In 1991, a total of 24 overnight hoop/trap net sets were completed. No brook trout were caught. The most recent stocking had occurred in 1988. Many sets were in relatively shallow water and may not have been effective at catching trout. White sucker and golden shiners were first documented at this time, presumably introduced accidentally.

Collectively, assessments up to 1991 suggest that Clayton Lake had a limited or no natural brook trout population, but that stocking was successful at creating a fishery. The reason for the cessation of stocking in 1991 is not documented.

In about 2004, an environmental assessment process was completed to allow the stocking of rainbow trout. It was felt that although brook trout stocking had been successful in the past the isothermal nature of the lake lent itself more to a species more tolerant of warmer water. Rainbow Trout were stocked for the first time in 2008 (1000 fall fingerlings) and then again in 2010 (500 fall fingerlings). A netting assessment was completed in 2011 to determine the success of the rainbow trout stocking.

Methods

The assessment occurred on August 31 – September 1, 2011. No strict protocol was followed, though aspects of the *Brook Trout Index Netting* (Monroe 2005) manual were used. Gear consisted of two gangs of gillnet each comprised of three, 15 m panels of either 51 mm or 64 mm mesh. The targeted depth was 3-6 meters. Seven nets were set for a short period during the day (1-2 hours) (Figure 1). As these yielded low catches, four additional sets were left overnight. The sets were mainly perpendicular to the shoreline, although set 7 was parallel to keep the net in the desired stratum. Three minnow traps were set in different areas to determine the baitfish composition of the lake. A dissolved oxygen and temperature profile was also collected.

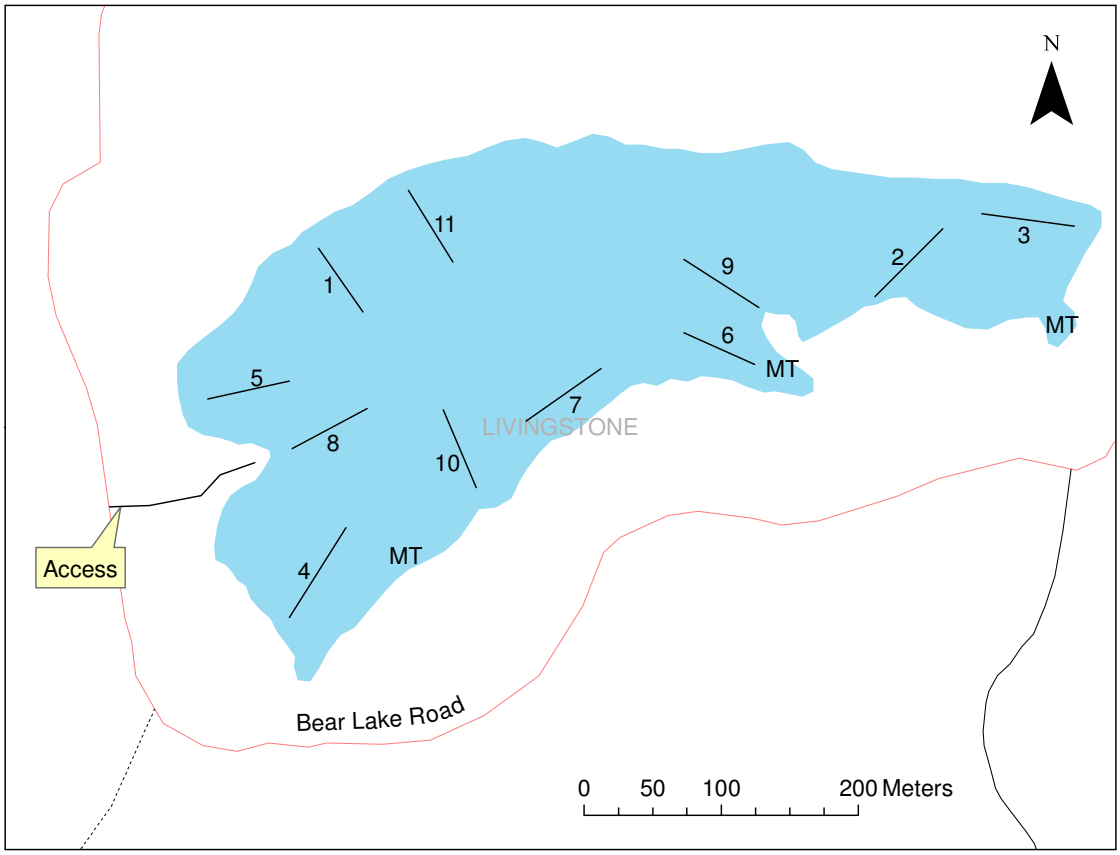


Figure 1 Map of net set and minnow trap locations, Clayton Lake, 2011.

Results and Discussion

The dissolved oxygen and temperature profile is shown in Table 1. The lake was essentially isothermal with oxygen depletion occurring only just above the sediments at the deepest point.

Table 1 Dissolved oxygen and temperature profile, Clayton Lake, August 31, 2011.

Depth (m)	Temperature ©	Dissolved Oxygen (PPM)
1.0	21.2	6.9
2.0	21.2	6.6
3.0	21.1	6.6
4.0	21.1	6.4
5.0	21.1	6.2
6.0	21.0	6.1
7.0	21.0	5.8
8.0	21.0	1.1

The seven short-duration day time sets caught one brook trout (Table 2). It was a mature female that was 280 mm fork length (FL) long (Table 3).

The overnight sets caught six rainbow trout. They ranged in size from 395 to 509 mm FL and 675 to 1600 g round weight (RWT). Stomach contents were composed of aquatic invertebrates and brook sticklebacks.

Table 2 Net set effort and catch summary, Clayton Lake, 2011

Effort	Start Depth (m)	End Depth (m)	Start Time	End Time	Catch	Comment
1	2.8	5.4	1120	1230		
2	2.5	7.7	1133	1247		
3	3.1	6.0	1145	1315		
4	3.0	6.3	1155	1355	1 brook trout	
5	2.9	5.5	1242	1425		
6	4.0	6.3	1255	1430		
7	4.1	4.5	1321	1436		
8	3.2	5.6	1400	1020		overnight
9	3.4	7.6	1424	1051	2 rainbow trout	overnight
10	2.7	5.8	1434	1005	2 rainbow trout	overnight
11	2.4	7.9	1445	1036	2 rainbow trout	overnight

Table 3 Detailed fish data, Clayton Lake, 2011.

Fish	Species	FL (mm)	TL (mm)	RWT (g)	Sex	Maturity	Stomach content	Comment
1	brook trout	280	287	220	female		invertebrates	
2	rainbow trout	421	421	750				released
3	rainbow trout	479	510	1250	female	developing	invertebrates, stickleback	
4	rainbow trout	440	468	1050	female	developing	damselfly larva	
5	rainbow trout	395	416	675	male	developing		
6	rainbow trout	509	537	1600	male	developing	invertebrates, stickleback	
7	rainbow trout	415	435	800	female		invertebrates	

The three minnow traps were set in different habitats of the lake; only one fish was caught, a brook stickleback. The trap that caught it was set along the most southern shoreline of the lake. The trap was placed in heavy log cover where small fishes were observed.

The brook sticklebacks which were caught in the minnow trap and found in stomach contents, are the first record of the species from Clayton Lake. It is likely that they are native. White suckers were not caught. The 1991 assessment caught only one and suggested that it was present due to an inadvertent introduction. Apparently a reproducing population was not established. This is a positive observation as white suckers would compete directly with trout for the invertebrate-dominated food supply in this lake.

Conclusions and Recommendations

Clayton Lake appears to support a very small natural brook trout population. This is consistent with the limited amount of good thermal habitat. We conclude that the large number of brook trout caught in earlier assessments were primarily stocked fish.

The catch of six rainbow trout, despite the very high water clarity and generally low catchability of the species, indicates that survival has been reasonable. Age structures were not collected but it appears that fish from both plantings were present in the catch. The food supply appears to be dominated by invertebrates, which rainbow trout are suited to take advantage of, as evidenced by good growth. The lake has good near shore habitat for fish; most of the shoreline is a rocky drop off with fallen log cover. High levels of dissolved oxygen are found throughout the water column.

Clayton Lake is easy to access; a small boat can be carried down the trail and launched at the shoreline.

It is recommended that rainbow trout stocking on a put-grow-take basis be continued.

References

Monroe, B. 2005. Manual of instructions: brook trout index netting. Algonquin Fisheries Assessment Unit, Ministry of Natural Resources, Whitney. 31 p.