Results of a Fish Community Assessment of Morrison Lake 2012

File Report

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Bracebridge, Ontario

2013

Morrison Lake is a medium-sized (249 ha) lake located in Wood Township. It is relatively shallow (Z_{max}= 18 m, Z_{mean} = 4 m) and is an oligotrophic lake with moderate water clarity and low nutrient levels (Secchi depth = 3.2 m, TP = 8.7 ug/l, DMM 2011) (Figure 1).

The lake supports a cool water fishery consisting of largemouth and smallmouth bass, muskellunge and northern pike. Other species known to occur include white sucker, brown bullhead, pumpkinseed, rock bass and a number of small fish species. Ciscos inhabit the limited area of deep water.

Morrison Lake has a limited stocking history. Smallmouth bass were stocked occasionally from 1947 to 1969; largemouth bass in 1954 and 1955 and muskellunge in 1953 and 1965). It isn't clear which if any of these stocking events were new introductions or if the species were native and the stocking was supplemental in nature.

Morrison Lake is one of the very few lakes in Parry Sound District that supports a population of muskellunge, although little is known of the status of the population. Northern pike were first reported to the Bracebridge MNR office in 2007, but they had been present since at least 2002 (L. Angot pers. comm.). Pike have been documented to impact muskellunge populations through competition and direct predation by pike on young muskellunge (Kerr and Grant 2000).

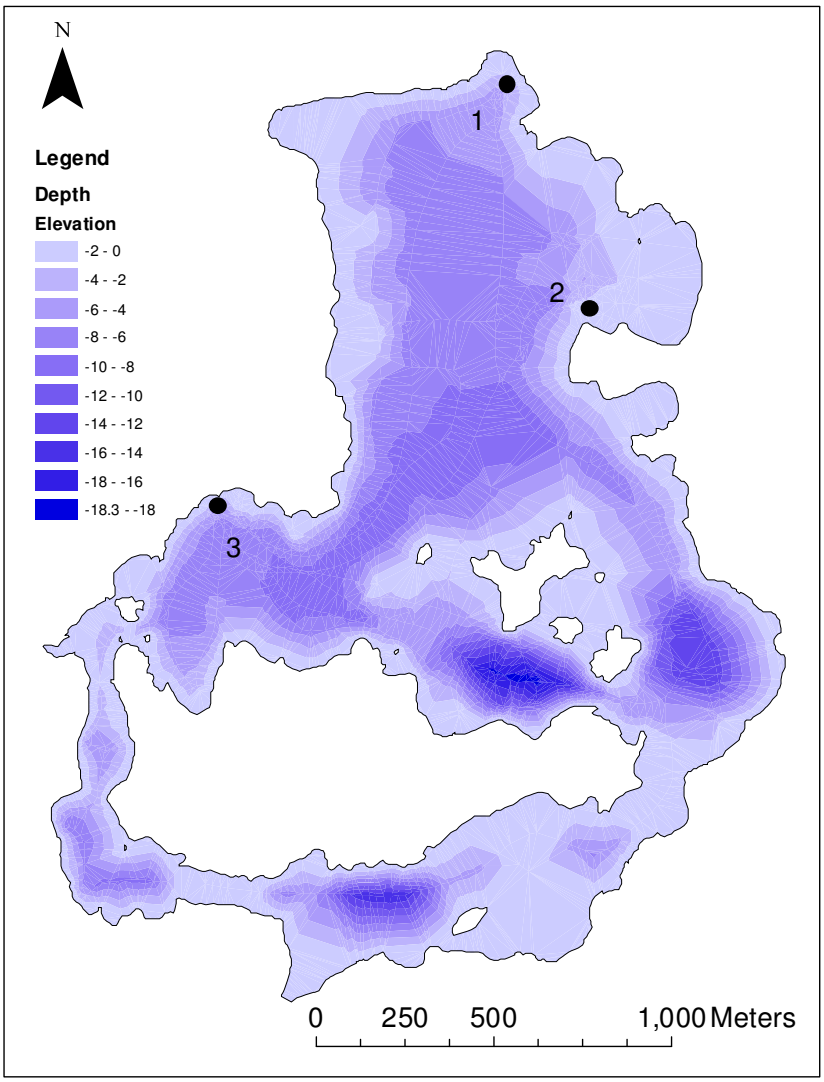


Figure 1 Map of Morrison Lake showing bathymetry (provisional) and net set locations, 2012.

Lake inventories were done on the lake in 1968 and 1987; including bathymetric mapping, basic water chemistry and documenting fish species occurrence. In 1978, a study was done of cisco (lake herring) growth, diet and parasite load (Gilmore 1979).

A low intensity trap netting project was conducted in 2012 to obtain an update of the composition of the fish community. The purpose was to collect background information in support of a District proposal to introduce black crappie into Muldrew and Morrison Lakes.

Methods

Components of the Nearshore Community Index Netting (NSCIN) protocol were followed (Stirling 1999). Gear consisted of six-foot (1.8 m) spring-haul trap nets with 150 ft (45.7 m) leads. Nets were set perpendicular to shore in water with a target depth of 1.7 to 3.5 m deep at the gap. Nets were set over night.

Captured fish were measured for fork length and released.

Zooplankton hauls were collected at the deepest point in the lake, the downwind end of the lake and close to the access point to determine the presence of invasive spiny water flea (Sandstrom et al. 2010).

Bathymetry data was collected with a GPS depth sounder opportunistically while travelling the lake but a systematic survey was not completed.

Results and Discussion

Nets were set on August 1 and lifted on August 2, 2012. Three net sets were completed (Table 1, Figure 1). Net set locations were chosen to sample a variety of habitats and locations. Net 1 was in a shallow bay near the inlet with a soft muck bottom and abundant macrophytes. Net 2 was on an exposed shoreline with a sandy bottom and little cover. Net 3 was deeper and had a mix of sandy and soft bottom with some vegetation.

Table 1 Net set details, Morrison Lake, 2012.

Set	Easting	Northing	Set Time	Lift Time	Depth (m)			Substrate	Cover
					Start	Mid	Gap		
1	622251	4970954	11:30	9:45	0	2	3	soft mix: muck, detritus	high: macrophytes, logs/trees
2	622483	4970323	12:30	11:00	0	0.8	1.6	sand: sand, silt	low: logs/trees
3	621434	4969762	13:10	12:05	0	2	4	sand: sand , detritus	low: macrophytes

A total of 92 fish of eight different species were caught (Table 2). Smallmouth bass were most frequently caught (33) with most occurring at Site 3 (21). Largemouth bass were the second most commonly caught species, with 26 being captured, most at Site 1 (21). Rock bass (16) and northern pike (10) were caught in moderate numbers. Bluegill (3, Figure 2), muskellunge (2), white sucker (1) and brown bullhead (1) comprised the remainder of the catch.

The smallmouth bass ranged from 180 to 467 mm fork length with a broad range of sizes well represented in the catch (Table 3 and 4). A similar range in sizes of largemouth bass was caught (235-450 mm). The northern pike were primarily between 450 and 650 mm. The two muskellunge were 892 and 1100 mm.

Table 2 Catch summary, Morrison Lake, 2012.

Set	northern pike	muskel-lunge	white sucker	brown bullhead	rock bass	bluegill	smallmouth bass	largemouth bass
1	2				8	1	4	21
2	6	1			3		8	2
3	2	1	1	1	5	2	21	3
Total	10	2	1	1	16	3	33	26



Figure 2 Bluegill, Morrison Lake, August 2, 2012.

Table 3 Descriptive statistics for fork length (mm), by species, Morrison Lake, 2012.

Species	n	Mean	Std. Dev.	Min.	Max
northern pike	10	556	95	355	648
muskellunge	2	996	147	892	1100
white sucker	1	500			
brown bullhead	1	175			
rock bass	16	144	32	110	200
bluegill	2	143	4	140	145
smallmouth bass	33	310	100	180	467
largemouth bass	26	352	59	235	450

Table 4 Fork length distribution, by species, Morrison Lake, 2012.

Fork Length (mm)	northern pike	muskel-lunge	white sucker	brown bullhead	rock bass	bluegill	smallmouth bass	largemouth bass
100-149					9	2		
150-199				1	6		4	
200-249					1		8	2
250-299							4	4
300-349							5	5
350-399	1						2	9
400-449							6	5
450-499	2						4	1
500-549	1		1					
550-599	1							
600-649	5							
850-899		1						
1050-1100		1						
Total	10	2	1	1	16	2	33	26

The contents of the zooplankton hauls were not analyzed in detail, but no spiny water fleas were identified.

Public contacts made as a result of the netting activity and the public notice for the proposed stocking yielded some supplemental information. A 'bloom' of the medusae of freshwater jellyfish was reported in September 2012. An angler provided a summary of his muskellunge and pike catches since 2001 (Table 5). A decline in the number of muskellunge caught coincides with an increase in pike catch. A number of muskellunge greater than 50" long were reported.

Table 5 Reported muskellunge and northern pike angling summary, L. Angot (pers. comm.).

	Muskellunge				Pike		
Year	Number	Mean Length (in.)	Number <40"	Number >50"	Number	Mean Length (in.)	Size Detail
2001	50	44	10	5			
2002	30	44	0	2	5		
2003	20	44	0	0	50	24	
2004	20	44	2	2	50	24	
2005	10	44	0	0	100	24	20% > 30"
2006	10	44	0	0	100	24	30% > 30"
2007	10	44	0	2	100	24	30% > 30"
2008	6	44	0	0	150		30% < 24", 30% > 30"
2009	6	44	0	2	200		30% < 24", 30% > 30"
2010	4	40-44	0	0	200		30% < 24", 30% > 30"
2011	2	40-44	0	0	200		a few over 40"
2012	1	44					many < 20"

The amount of netting effort in this survey was limited and was intended to obtain a cursory description of the fish community; in particular to confirm the presence of northern pike or any other new introductions. The sample size provides some indication of the community composition but was too small to make robust estimates of abundance or the attributes of individual species populations.

The survey confirmed the presence of northern pike in the lake. The catch of a number of fish of various sizes supplemented with the angler report confirms that a robust reproducing population is established and comprises

a major component of the fish community. As a large-bodied top predator pike are capable of having impacts on other species in the lake and have probably affected the abundance and population structure of the major prey species such as yellow perch, pumpkinseed and rock bass. Largemouth and smallmouth bass would be eaten as well, particularly smaller individuals, but the survey results show that the both species are still common and appear to have a healthy range of sizes in their populations. Without survey information from before pike became established it is not possible to determine how much impact pike have had on these species.

The two muskellunge caught confirm their continued presence in the lake. The netting results give only a limited indication of their abundance but the angler report indicates that the population has declined since pike have become established. Kahshe Lake, nearby, also has a muskellunge and was invaded by pike about 20 years ago. Sporadic reports indicate that muskellunge continue to persist in Kahshe Lake at a low level of abundance. The long-term prognosis for Morrison Lake is probably the same.

Muskellunge are managed by the application of minimum size limits, based on documented growth potential for individual populations (OMNR 2003). In the absence of lake-specific information a generic 91 cm minimum size limit is applied in FMZ 15. Adequate information is provided here to show that the growth potential of this population is well over 40” and therefore a lake-specific regulation could be applied.

The survey also detected the presence of bluegill; believed to be the first record of this species from the lake and the first verified record from inland waters in Parry Sound District. They have been documented nearby in Sparrow Lake on the Severn River system (Broad-scale Monitoring, Cycle 1 raw data). With no information on how long they have been in Morrison Lake it is difficult to speculate how abundant they may be become or their impact on the rest of the fish community. Keast et al. 1978, found them to be most abundant in vegetated areas but were versatile and could be found in most habitat types present in Opinicon Lake. They will probably compete with other small centrarchids, such as pumpkinseed (which were not caught in the survey but are probably present) and rock bass but will not become a dominant component of the fish community as they have in the shallow, productive, heavily vegetated Kawartha Lakes.

No black crappie were captured. Following the survey a second hand report was received of an angler catching crappie. If crappie were present in significant numbers they should have been present in the trap net catch and without verification of the angler report it must be assumed that they are not yet present in the lake.

Spiny water fleas were not found in the zooplankton samples. They are now established in most large lakes in Muskoka and it is probably inevitable that they will eventually colonize Morrison Lake as well. It is well documented that they have a major impact on native zooplankton communities (Yan et al. 2011) but to date evidence of long term impacts on fish communities is lacking.

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Appendix Biological attributes of sampled fish, Morrison Lake, 2012.

Sample	Species	Fish	Fork Length (mm)	Round Weight (g)
1	131	1	490	
1	131	2	476	
2	131	2	528	
2	131	3	615	
2	131	4	560	
2	131	5	640	
2	131	6	648	
2	131	7	620	
3	131	2	630	
3	131	36	355	
2	132	1	1100	
3	132	1	892	
3	163	19	500	
3	233	33	175	
1	311	28	185	
1	311	29	200	
1	311	30	175	
1	311	32	110	
1	311	33	112	
1	311	34	114	
1	311	35	115	
1	311	36	110	
2	311	18	180	
2	311	19	175	
2	311	20	120	
3	311	23	170	
3	311	25	120	
3	311	31	125	
3	311	32	155	
3	311	35	135	
1	314	31	140	
3	314	24		
3	314	34	145	
1	316	19	320	
1	316	20	305	
1	316	21	335	
1	316	26	285	
2	316	8	462	
2	316	10	463	
2	316	11	467	
2	316	12	440	
2	316	13	429	
2	316	14	409	
2	316	15	455	
2	316	17	420	
3	316	4	350	
3	316	5	342	
3	316	6	402	
3	316	7	300	
3	316	8	355	
3	316	9	434	
3	316	10	258	
3	316	11	200	
3	316	13	215	
3	316	14	190	
3	316	16	200	
3	316	17	190	
3	316	18	230	
3	316	20	210	
3	316	21	180	
3	316	22	195	
3	316	26	220	
3	316	27	295	
3	316	28	250	
3	316	29	200	
3	316	30	215	
1	317	3	378	
1	317	4	343	
1	317	5	390	
1	317	6	400	
1	317	7	382	
1	317	8	409	
1	317	9	352	
1	317	10	374	
1	317	11	425	1350
1	317	12	270	
1	317	13	395	
1	317	14	305	
1	317	15	324	
1	317	16	350	
1	317	17	290	
1	317	18	295	
1	317	22	235	
1	317	23	440	1520
1	317	24	375	
1	317	25	335	
1	317	27	300	
2	317	9	410	
2	317	16	382	
3	317	3	450	
3	317	12	290	
3	317	15	243	