Splake Stocking and Fish Community Assessment of Clear Lake

File Report

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Clear Lake (Figure 1) is a small (107 ha) but relatively deep (28 m) lake located within the Perry Township. Access to this lake can be found by taking Highway 11 north of Novar to Highway 592 and travelling 6 km north on Highway 592 to Clear Lake Rd. A public boat launch located at the end of Clear Lake Road.

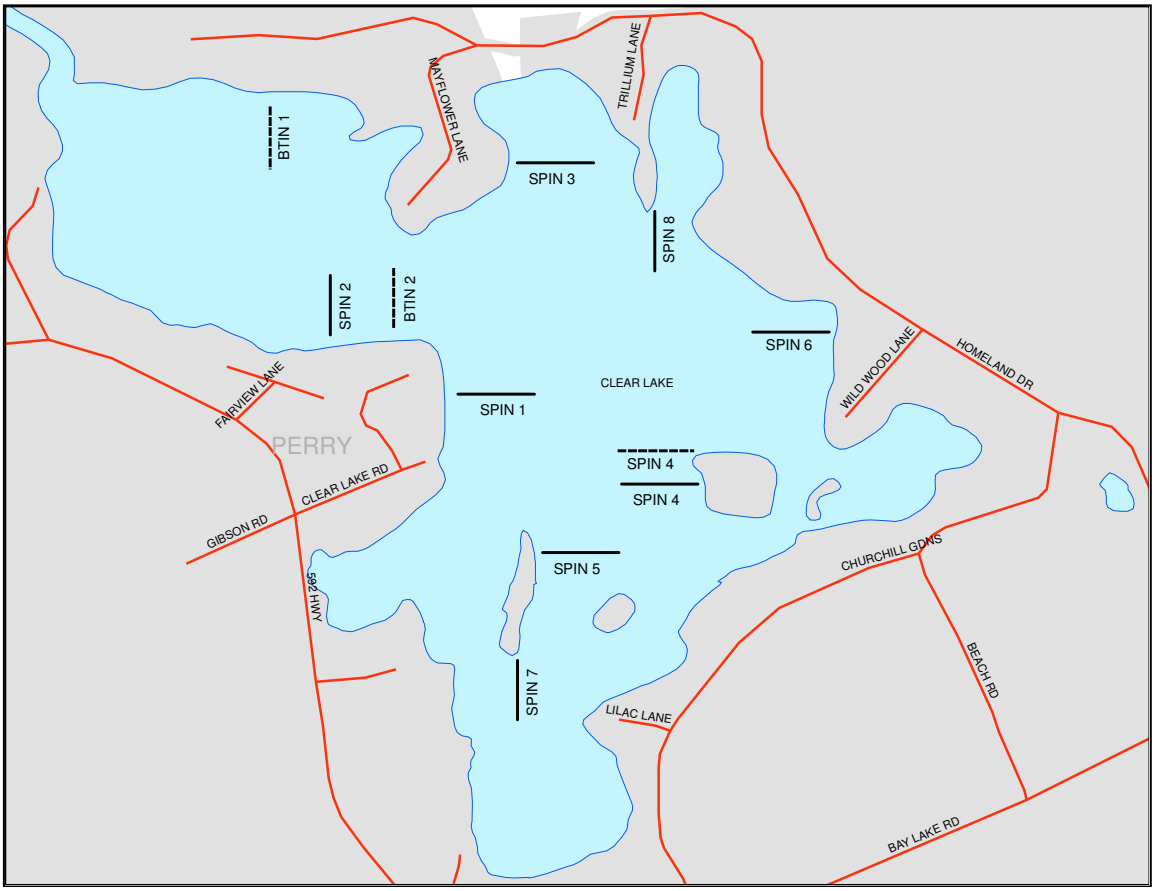


Figure 1 Map showing net set locations, Clear, Lake, 2010.

Lake trout (*Salvelinus namaycush)* and possibly brook trout (*Salvelinus fontinalis)* were native to the lake. With limited habitat available the lake trout population was probably small and unable to sustain significant exploitation. Stocking began in 1930 and continued until 1976.

An assessment of the lake trout population in 1980 concluded that the lake was unable to support a lake trout fishery (Chapple 1980). Subsequently, splake *(Salvelinus fontinalis x S. namaycush)* were stocked, beginning in 1983. A follow-up assessment was conducted in 1985 and two splake were captured (Gillespie 1985). Stocking has continued until the present, generally with yearlings of the Killala Lake x Hills Lake strain, on an alternate year basis, most recently in 2009 (Table 1). However, the minimal amount of anecdotal information that exists indicates that there is very little interest in the splake fishery, suggesting that it is of poor quality.

Table 1 Recent splake stocking history, Clear Lake.

Year	Number
2001	4000
2003	4000
2005	4000
2007	2000
2009	2000

Stocking of other species has occurred as well. Smallmouth bass (*Micropterus dolomieui*) were stocked from 1956 to 1960 and a self-sustaining population is now present. Brook trout were stocked from 1935 to 1952; presumably discontinued due to poor returns. Finally, rainbow trout (*Onchorhynchus mykiss)* were stocked periodically from 1981 to 2004.

An assessment was conducted in June 2010 to determine the status of the current splake population; specifically to determine whether stocking efforts were successful and the overall current status of the fish community.

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 in mesh and the second of 2.5 in mesh. One net was set for a period of 2 hours focusing on depths around 6 m. Two more nets were set overnight focusing on depths ranging from 2.5 to 10 m.

SPIN gear consisted of gill nets that were 64 m long by 1.8 m high and have eight panels of the following stretch mesh sizes; 2.25, 2.50, 2.75, 3.00, 3.50, 4.00, 4.50 and 5.00 in. The mesh sizes were randomly arranged. SPIN nets were initially set for 2 hour periods focusing on depths ranging from 4 to 12 m. Due to poor catch results; more nets were set overnight at depths ranging from 5 to 12 m. Both BTIN and SPIN nets were set perpendicular to shore.

Captured fish species were measured for fork length and age structures were taken on target species. In some cases fish were only counted due to large numbers caught in the net.

Secchi disc measurements were taken to determine water clarity and a temperature and dissolved oxygen profile was collected to determine suitable habitats for net placement.

RESULTS and DISCUSSION

Netting was conducted between June 17 and June 18, 2010. Weather conditions were sunny with no precipitation. Surface water temperature was steady around 19°C throughout the duration of the sets and dissolved oxygen readings ranged from 12.2 to 0.1 mg/L throughout the water column (Table 2). The range of depths at which cold water species could be expected was about 6 to 15 m. The Secchi disc depth was 6.6 m; relatively high water clarity.

Table 2 Temperature and dissolved oxygen profile, Clear Lake, June 17, 2010.

Depth (m)	Temp. (°C)	D.O. (mg/L)
0.5	19.2	9.7
1	19.1	9.7
2	19.1	9.7
3	19.0	9.7
4	18.9	9.8
5	18.8	9.8
6	16.5	11.8
7	14.9	12.0
8	13.8	12.0
9	12.6	12.2
10	10.6	12.1
11	8.7	10.8
12	7.3	9.1
13	6.4	7.0
14	5.9	5.6
15	5.6	3.7
16	5.5	3.1
17	5.4	2.0
18	5.1	1.3
19	5.1	0.6
20	5.0	0.1

A total of 11 nets sets were completed. Details on net set data can be found in the following Table 3.

Table 3 Net set details, Clear Lake, June 17, 2010.

Effort #	Gear Type	Set Date	Zone	Easting	Northing	Depth (start) (m)	Depth (mid) (m)	Depth (end) (m)	Set Time	Lift Time	Duration (hrs)	Comments
1	SPIN	17-Jun-10	17	635738	5040560	12	15	15	10:30	12:30	2.0	
2	SPIN	17-Jun-10	17	635422	5040706	4	7	8	11:00	13:00	2.0	
3	SPIN	17-Jun-10	17	635800	5040961	4	8	13	11:30	13:30	2.0	
4	SPIN	17-Jun-10	17	636088	5040410	6	9	10	12:00	14:00	2.0	
5	SPIN	17-Jun-10	17	635868	5040292	5	12	10	12:30	14:30	2.0	
6	SPIN	17-Jun-10	17	636314	5040706	5	9	9	13:00	15:00	2.0	
7	SPIN	17-Jun-10	17	635810	5040028	7	8	9	15:00	10:45	19.8	overnight set
8	SPIN	17-Jun-10	17	636044	5040858	5	10	12	15:30	11:45	20.2	overnight set
9	BTIN	17-Jun-10	17	635322	5041000	6		6	12:20	14:20	2.0	
10	BTIN	17-Jun-10	17	635532	5040748	5		8	14:30	9:30	19.5	overnight set
11	BTIN	17-Jun-10	17	636025	5040471	2.5		10	15:30	13:00	21.5	overnight set

One daytime two-hour BTIN set was unsuccessful in producing any fish. It was decided to set two overnight BTIN sets and they were successful in catching 204 rock bass (*Ambloplites rupestris*), 1 smallmouth bass and 8 white sucker (*Catostomus commersoni).*

The daytime SPIN net sets were successful in producing a small catch. Six 2-hour sets were conducted and 3 smallmouth bass, 7 white sucker and 1 splake were caught. It was decided to set two overnight sets due to low catch efforts and they were successful in catching 51 rock bass, 3 smallmouth bass, 62 white sucker, 2 yellow perch (*Perca flavescens*), 1 rainbow trout, 1 burbot *(Lota lota)* and one brown bullhead (*Ameiurus nebulosus).* The total catch of fish sampled from both BTIN and SPIN efforts can be found in Table 4.

Table 4 Catch summary for Clear Lake, June 17 to 18, 2010.

Effort #	Gear Type	Rock Bass	Smallmouth Bass	White Sucker	Yellow Perch	Splake	Rainbow Trout	Burbot	Brown Bullhead
1	SPIN	0	0	0	0	0	0	0	0
2	SPIN	0	0	1	0	0	0	0	0
3	SPIN	0	1	0	0	0	0	0	0
4	SPIN	0	2	0	0	0	0	0	0
5	SPIN	0	0	3	0	0	0	0	0
6	SPIN	0	0	3	0	1	0	0	0
7	SPIN	14	0	47	2	0	0	1	0
8	SPIN	37	3	15	0	0	1	0	1
9	BTIN	0	0	0	0	0	0	0	0
10	BTIN	151	1	4	1	0	0	0	0
11	BTIN	53	0	4	0	0	0	1	0
Total Catch		**255**	**7**	**77**	**3**	**1**	**1**	**2**	**1**

The summary of minimum, maximum and mean fork length of species caught can be found in Table 5. The single splake caught was a large individual with a fork length of 702 mm. It appeared healthy and had a good condition factor. The single rainbow trout was also fairly large (552mm FL) but it was thin and appeared to be in poor condition. Its' stomach contained a bolus of spiny water fleas.

Table 5 Minimum, maximum and mean fork length, by species, Clear Lake, 2010.

Species	Sample Size	Min Fork Length	Max Fork Length	Mean Fork Length
Rock Bass	154	121	195	157
Smallmouth Bass	7	207	372	287
White Sucker	77	404	542	465
Yellow Perch	3	199	283	245
Splake	1	702	702	702
Rainbow Trout	1	552	552	552
Burbot	2	388	395	392
Brown Bullhead	1	273	273	273

Additional information on catch data can be found in Table 6 in the appendix.

This assessment detected two species not previously documented in Clear Lake; rock bass and spiny water flea. Both species have probably become established inadvertently through bait bucket or live well dumping or other human activity. It is possible that rock bass were intentionally stocked, albeit, without authorization. Both species have the ability of have a major influence on the lake; on the near shore fish community for rock bass and the offshore zooplankton community and related food web for the spiny water flea.

Only one splake was caught despite regular stocking of large numbers of fish. Clearly, early survival for the year of stocking is very poor. Based on the one fish caught, a splake that does manage to grow to a critical size can find good feeding opportunities. Conversely, the rainbow trout did not.

Smallmouth bass, rock bass, yellow perch and burbot compete with splake for available food sources. In particular the high rock bass density could be resulting in strong competition for the available food for newly stocked fish. The high water clarity indicates that the lake is poor in productivity which would exacerbate the problem.

Smallmouth bass, rock bass and burbot are potential predators of small splake. The lake has a relatively large littoral zone, compared to the area of deep water, which support large populations of bass. The high water clarity may be a factor that contributes to high predation, particularly by bass. Anecdotally, burbot are common in the lake and may be a major predator as well.

From 1995 to 2005 the stocking rate of splake was consistently 4000 fish ranging from 26 to 73 g. On average, that rate was about twice the suggested guideline (2.0-2.5 kg/ha for waters > 6 m deep; OMNR 2002). The rate had been calculated when the fish size was near the lower end of the range of sizes (25-30 g); however, in recent years the fish stocked have averaged closer to 50 g. The stocking rate was updated and in 2007 and 2009 only 2000 splake were stocked. Overstocking of splake may have been another reason for the poor survival due to the competition for available resources.

Biennial stocking of Clear Lake with yearling splake currently has a low level of success. Different stocking methods are going to have to be implemented in order to improve the splake population in Clear Lake. The reduction in the stocking rate does not appear to have improved survival; although there may be a lag time before the forage food supply improves. Other options for improving survival include stocking a different genetic strain other than the Killala Lake X Hills Lake strain currently stocked, and stocking fish at a larger size, possibly fall yearlings, but at reduced numbers. Continued monitoring should be done to assess any further changes to the stocking strategy. If better survival and returns of stocked fish can not be realized, stocking should be discontinued.

REFERENCES

Chapple, B. 1980. Clear Lake Perry Township lake trout assessment program, 1980. File Report. Ontario Ministry of Natural Resources, Bracebridge. 12 p + appendices.

Gillespie, G. 1985. Schamerhorn Lake splake stocking assessment – 1985. File Report. Ontario Ministry of Natural Resources, Bracebridge. 4 p + appendices.

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.

APPENDIX

Table 6 Detailed catch information, Clear Lake, June 17 to 18, 2010.

Effort #	Gear Type	Mesh Size	Species	Fish #	Fork Length	Fate	Comments
2	SPIN	300	163	1	415	RG	
3	SPIN	350	316	2	343	RG	
4	SPIN	250	316	3	260	RG	
4	SPIN	250	316	4	241	RG	
5	SPIN	450	163	5	443	RG	
5	SPIN	450	163	6	425	RG	
5	SPIN	450	163	7	503	RG	
6	SPIN	225	163	8	435	RG	
6	SPIN	300	163	9	503	RG	
6	SPIN	400	82	10	702	RG	
6	SPIN	300	163	11	458	RG	
7	SPIN	300	163	12	495	RG	
7	SPIN	300	163	13	428	RG	
7	SPIN	300	163	14	432	RG	
7	SPIN	300	163	15	440	RG	
7	SPIN	300	163	16	412	RG	
7	SPIN	300	331	17	283	RG	
7	SPIN	300	163	18	488	RG	
7	SPIN	300	163	19	515	RG	
7	SPIN	350	163	20	425	RG	
7	SPIN	350	163	21	480	RG	
7	SPIN	350	163	22	440	D	
7	SPIN	350	163	23	404	D	
7	SPIN	350	163	24	440	RP	
7	SPIN	350	163	25	490	RG	
7	SPIN	350	163	26	470	D	
7	SPIN	350	163	27	498	RG	
7	SPIN	225	163	28	443	RG	
7	SPIN	225	311	29	142	D	
7	SPIN	225	163	30	493	RG	
7	SPIN	225	311	31	132	D	
7	SPIN	225	311	32	142	D	
7	SPIN	225	271	33	395	D	
7	SPIN	400	163	34	442	D	
7	SPIN	400	163	35	435	D	
7	SPIN	400	163	36	473	D	
7	SPIN	400	163	37	438	D	
7	SPIN	400	163	38	493	D	
7	SPIN	400	163	39	425	D	
7	SPIN	400	163	40	455	RG	
7	SPIN	400	163	41	484	D	
7	SPIN	450	163	42	487	RF	
7	SPIN	450	163	43	472	D	
7	SPIN	450	163	44	495	RF	
7	SPIN	450	163	45	465	RP	
7	SPIN	450	163	46	495	D	
7	SPIN	450	163	47	506	RG	
7	SPIN	450	163	48	472	RP	
7	SPIN	450	163	49	508	RP	

Effort #	Gear Type	Mesh Size	Species	Fish #	Fork Length	Fate	Comments
7	SPIN	250	163	50	484	D	
7	SPIN	250	311	51	188	D	
7	SPIN	250	311	52	174	D	
7	SPIN	250	311	53	163	D	
7	SPIN	250	311	54	165	D	
7	SPIN	250	163	55	420	D	
7	SPIN	250	311	56	145	D	
7	SPIN	250	311	57	147	D	
7	SPIN	250	311	58	169	D	
7	SPIN	250	311	59	172	D	
7	SPIN	250	311	60	152	D	
7	SPIN	250	311	61	170	D	
7	SPIN	250	311	62	169	D	
7	SPIN	500	163	63	470	D	
7	SPIN	500	163	64	496	D	
7	SPIN	500	163	65	507	RP	
7	SPIN	500	163	66	527	D	
7	SPIN	500	163	67	542	D	
7	SPIN	275	163	68	409	D	
7	SPIN	275	163	69	415	D	
7	SPIN	275	331	70	252	RF	
7	SPIN	275	163	71	457	D	
7	SPIN	275	163	72	488	D	
7	SPIN	275	163	73	488	D	
7	SPIN	275	163	74	433	D	
7	SPIN	400	163	75	477	D	
8	SPIN	450	163	76	455	D	
8	SPIN	250	163	77	440	D	
8	SPIN	500	163	78	490	D	
8	SPIN	275	76	79	552	D	
8	SPIN	275	311	80	190	RF	
8	SPIN	275	163	81	425	RF	
8	SPIN	400	163	82	515	RF	
8	SPIN	400	163	83	475	D	
8	SPIN	300	233	84	273	RG	
8	SPIN	300	163	85	426	D	
8	SPIN	UNK	163	86	514	RG	Fell out of net
8	SPIN	300	163	87	440	D	
8	SPIN	300	316	88	342	D	
8	SPIN	300	316	89	372	D	
8	SPIN	225	163	90	417	D	
8	SPIN	225	311	91	158	D	
8	SPIN	225	311	92	152	D	
8	SPIN	225	311	93	154	D	
8	SPIN	225	311	94	169	D	
8	SPIN	225	311	95	190	RG	
8	SPIN	225	311	96	164	D	
8	SPIN	225	311	97	152	D	
8	SPIN	225	311	98	165	RG	
8	SPIN	225	311	99	158	D	
8	SPIN	225	311	100	143	D	
8	SPIN	225	311	101	154	D	
8	SPIN	225	311	102	150	D	
8	SPIN	225	311	103	150	RG	

Effort #	Gear Type	Mesh Size	Species	Fish #	Fork Length	Fate	Comments
8	SPIN	225	311	104	152	RG	
8	SPIN	225	311	105	153	RG	
8	SPIN	225	311	106	160	D	
8	SPIN	225	311	107	161	D	
8	SPIN	225	311	108	148	RG	
8	SPIN	225	311	109	162	D	
8	SPIN	225	311	110	166	D	
8	SPIN	225	311	111	152	D	
8	SPIN	225	311	112	148	D	
8	SPIN	225	311	113	171	RG	
8	SPIN	225	311	114	152	D	
8	SPIN	225	311	115	163	D	
8	SPIN	225	311	116	158	D	
8	SPIN	225	311	117	172	D	
8	SPIN	225	311	118	154	D	
8	SPIN	225	311	119	152	RG	
8	SPIN	225	311	120	142	D	
8	SPIN	225	311	121	162	D	
8	SPIN	225	311	122	160	D	
8	SPIN	225	316	123	242	D	
8	SPIN	225	311	124	155	D	
8	SPIN	225	311	125	178	D	
8	SPIN	225	311	126	172	D	
8	SPIN	225	311	127	163	D	
8	SPIN	400	163	128	484	D	
8	SPIN	400	163	129	515	D	
8	SPIN	400	163	130	444	D	
8	SPIN	400	163	131	496	D	
8	SPIN	400	163	132	504	D	
10	BTIN	200	311	133	124		
10	BTIN	200	163	134	501		
10	BTIN	200	163	135	451		
10	BTIN	200	311	136	146		
10	BTIN	200	311	137	137		
10	BTIN	200	311	138	134		
10	BTIN	200	316	139	207		
10	BTIN	200	163	140	450		
10	BTIN	200	163	141	430		
10	BTIN	200	311	142	133		
10	BTIN	200	311	143	145		
10	BTIN	200	311	144	128		
10	BTIN	200	311	145	145		
10	BTIN	200	311	146	127		
10	BTIN	200	311	147	135		
10	BTIN	200	311	148	132		
10	BTIN	200	311	149	123		
10	BTIN	200	311	150	145		
10	BTIN	200	311	151	136		
10	BTIN	200	311	152	137		
10	BTIN	200	311	153	135		
10	BTIN	200	311	154	143		
10	BTIN	200	311	155	139		
10	BTIN	200	311	156	142		
10	BTIN	200	311	157	154		

Effort #	Gear Type	Mesh Size	Species	Fish #	Fork Length	Fate	Comments
10	BTIN	200	311	158	149		
10	BTIN	200	311	159	152		
10	BTIN	200	311	160	140		
10	BTIN	200	311	161	130		
10	BTIN	200	311	162	126		
10	BTIN	200	311	163	146		
10	BTIN	200	311	164	133		
10	BTIN	200	311	165	165		
10	BTIN	200	311	166	132		
10	BTIN	200	311	167	135		
10	BTIN	200	311	168	136		
10	BTIN	200	311	169	135		
10	BTIN	200	311	170	149		
10	BTIN	200	311	171	165		
10	BTIN	200	311	172	150		
10	BTIN	200	311	173	165		
10	BTIN	200	311	174	134		
10	BTIN	200	311	175	135		
10	BTIN	200	311	176	135		
10	BTIN	200	311	177	165		
10	BTIN	200	311	178	130		
10	BTIN	200	311	179	121		
10	BTIN	200	311	180	135		
10	BTIN	200	311	181	125		
10	BTIN	200	311	182	130		
10	BTIN	200	311	183	139		
10	BTIN	200	311	184	140		
10	BTIN	200	311	185	167		
10	BTIN	200	311	186	136		
10	BTIN	200	311	187	139		
10	BTIN	200	311	188	126		
10	BTIN	200	331	189	199		
11	BTIN	250	163	190	435	RG	
11	BTIN	250	271	191	388	RG	
11	BTIN	250	311	192	178	RG	
11	BTIN	250	311	193	195	D	
11	BTIN	250	311	194	175	D	
11	BTIN	250	311	195	166	RG	
11	BTIN	250	311	196	172	RG	
11	BTIN	250	163	197	440	D	
11	BTIN	250	311	198	173	RG	
11	BTIN	250	311	199	161	RG	
11	BTIN	250	311	200	174	RG	
11	BTIN	250	311	201	177	RG	
11	BTIN	250	311	202	185	RG	
11	BTIN	250	311	203	170	RG	
11	BTIN	250	311	204	162	RG	
11	BTIN	250	311	205	167	RG	
11	BTIN	250	311	206	159	RG	
11	BTIN	250	311	207	163	RG	
11	BTIN	250	311	208	161	RG	
11	BTIN	250	311	209	182	RG	
11	BTIN	250	311	210	181	RG	
11	BTIN	250	311	211	180	RG	

Effort #	Gear Type	Mesh Size	Species	Fish #	Fork Length	Fate	Comments
11	BTIN	250	311	212	185	RG	
11	BTIN	250	311	213	166	RG	
11	BTIN	250	311	214	175	RG	
11	BTIN	250	163	215	440	RG	
11	BTIN	250	311	216	185	RG	
11	BTIN	250	311	217	174	RG	
11	BTIN	250	311	218	182	RG	
11	BTIN	250	311	219	193	D	
11	BTIN	250	311	220	192	RG	
11	BTIN	250	311	221	162	D	
11	BTIN	250	311	222	167	RG	
11	BTIN	250	311	223	182	RG	
11	BTIN	250	311	224	184	RG	
11	BTIN	250	311	225	174	RG	
11	BTIN	250	311	226	177	RG	
11	BTIN	250	311	227	165	RG	
11	BTIN	250	311	228	167	RG	
11	BTIN	250	311	229	165	RG	
11	BTIN	250	311	230	186	RG	
11	BTIN	250	311	231	168	RG	
11	BTIN	250	311	232	185	RG	
11	BTIN	250	311	233	168	RG	
11	BTIN	250	311	234	168	RG	
11	BTIN	250	311	235	165	RG	
11	BTIN	250	311	236	166	RG	
11	BTIN	250	311	237	190	RG	
11	BTIN	250	311	238	165	RG	
11	BTIN	250	163	239	482	D	
11	BTIN	250	311	240	165	RG	
11	BTIN	250	311	241	161	RG	
11	BTIN	250	311	242	175	RG	
11	BTIN	250	311	243	171	RG	
11	BTIN	250	311	244	165	RG	
11	BTIN	250	311	245	173	RG	
11	BTIN	250	311	246	161	D	

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