

Cantley Creek HADD Compensation Project:
2006 Post-Restoration Monitoring and Maintenance Report

by

Atlantic Coastal Action Program – Cape Breton (ACAP-CB)
P. O. Box 28, Station A, Sydney, NS, B1P 6G9

November 2006

Monitoring was carried out to ensure proper functioning of digger logs and survival of bank-side vegetation. Included in the 2006 portion of the project was a third Quality Habitat Evaluation. We also completed electro-fishing to compare the population evaluation of 2004 against 2006.

Digger Logs Monitoring and Maintenance

Digger logs were checked during low flow periods (July-August) to determine if they were functioning as intended (visual inspection and photographs). Two logs were found to be failing, and several deflectors were again increased in size.

Vegetation Enhancement Monitoring and Maintenance

Riparian vegetation maintenance occurred several times during the summer to ensure survivorship. This maintenance consisted of watering and cutting back of competitive weeds. Structures were observed several times to determine the rate at which the structures were able to root and grow. No waddles were found to have broken or dislodged. Monitoring of 300 Black spruce seedlings planted along residential properties in 2005 was performed it was noted that the survival rate of the seedlings was approximately 80%.

Monitoring Fish Population and Habitat Changes

Tables 1 and 2 contain pre-restoration and first year post QHEI which can be utilized for comparisons. Changes in fish habitat within the portion of Cantley Creek targeted for restoration was quantified by re-assessing the brook using the Quality Habitat Evaluation Index (QHEI) habitat protocols (see Table 3). The evaluation of geographical and physical characteristics of the restoration locations on Cantley Creek was made using the Ohio State Environmental Protection Agency's Qualitative Habitat Evaluation Index (QHEI). The QHEI is composed of an array of metrics that describe attributes of physical habitat that may be important in explaining the species presence, absence, and composition of fish communities in a stream.

Population studies using the electro-fishing method was completed during the summer of 2006. (see Appendix A/B) Included was the CABIN study which is used to monitor diversity and health changes of the stream. However the CABIN data will not be analyzed and compared till spring of 2007.

Table 1. Pre-restoration Cantley Creek (2004) habitat scoring for two sites assessed on Cantley Creek using Quality Habitat Evaluation Index (Metrics highest possible score in parentheses).

Metric	Site 1 Score	Site 2 Score
Substrate (max - 20 pts)	16	16
In stream Cover (max - 20 pts)	0	10
Channel Quality (max - 20 pts)	5	11
Riparian/Erosion (max- 10 pts)	5	5
Pool Riffle (max - 20 pts)	5	7
Gradient (max - 10 pts)	6	6
Total Score (100 pts)	37	55

Table 2. Post-restoration Cantley Creek (2005) habitat scoring for two sites assessed on Cantley Creek using Quality Habitat Evaluation Index (Metrics highest possible score in parentheses).

Metric	Site 1 Score	Site 2 Score
Substrate (max - 20 pts)	16	16
In stream Cover (max – 20 pts)	0	13
Channel Quality (max - 20 pts)	6	12
Riparian/Erosion (max- 10 pts)	6	6
Pool Riffle (max - 20 pts)	8	9
Gradient (max - 10 pts)	6	6
Total Score (100 pts)	42	62

Table 3. Post-restoration Cantley Creek (2006) habitat scoring for two sites assessed on Cantley Creek using Quality Habitat Evaluation Index (Metrics highest possible score in parentheses).

Metric	Site 1 Score	Site 2 Score
Substrate (max - 20 pts)	16	16
In stream Cover (max – 20 pts)	0	14
Channel Quality (max - 20 pts)	7	14
Riparian/Erosion (max- 10 pts)	8	8
Pool Riffle (max - 20 pts)	10	11
Gradient (max - 10 pts)	6	7
Total Score (100 pts)	47	70

The comparisons of pre-restoration versus post-restoration shows significant improvements for a two year time frame (see Table 1, Table 2 and Table 3). Improvements were a direct result of the pools that have begun to form on the downstream side of the digger logs that were installed.

The “In stream Cover” category remained at 0 for the lower reach due to the fact that the max water depth was still below 20 cm. According to the QHEI, in-stream cover is not useful (and therefore is assigned a 0) until water depths exceed 20 cm. Pools downstream of digger logs were very close to 20 cm deep in the lower section (deepest 16.5 cm when assessment carried out in August, 2005). We feel that the process of pool formation will continue in the years to come resulting in greater water depths which will allow portions of the lower reach to attain a depth of 20 cm or more, thus increasing the fish habitat quality as measured by the Quality Habitat Evaluation Index. Improvements in Riparian/Erosion were due to successful stabilization of a heavily eroding bank occurring along the upper reach (site 2). Further improvement in this category should be seen once seedlings and transplanted vegetation begins to attain greater heights (3-4 years).

Appendix A

Fish Data Collection Sheet – Electro-Fishing

Cantley Creek
Aug. 11/04

Fish #	Sweep #	Species	Length (mm)	Wet Weight (grams)
1	1	Brook Trout	200	100
2	1	Brook Trout	190	92
3	1	Brook Trout	160	48
4	1	Brook Trout	130	45
5	1	Brook Trout	160	52
6	1	Brook Trout	180	78
7	1	Brook Trout	58	6
8	1	Brook Trout	148	36
9	1	Dead Brook Trout	180	
10	1	Dead Brook Trout	175	
11	1	Dead Brook Trout	145	
12	2	Brook Trout	190	87
13	2	Brook Trout	165	68
14	2	Brook Trout	150	42
15	2	Brook Trout	155	50
16	2	Brook Trout	130	34
17	2	Brook Trout	125	25
18	2	Brook Trout	120	26
19	2	Brook Trout	65	6
20	3	Brook Trout	55	3
21	3	Brook Trout	55	3
22	3	Brook Trout	220	144
23	3	Brook Trout	160	60
24	3	Brook Trout	155	52
25	3	Brook Trout	145	50
26	3	Brook Trout	145	50
27	4	Brook Trout	130	23
28	4	Brook Trout	160	53

Remarks Dead Brook 180 mm
175 mm
145 mm
gill flaps open
mouth agape

Battery # Caddis Flies
4

Sweep #	Time (sec)	Fish - Alive	Fish - Dead
1	156	8	3
2	176	8	
3	164	7	
4	143	2	

Appendix B:

FISH DATA COLLECTION SHEET- ELECTRO-FISHING

CANTLEY CREEK AUG.23/06

CREW: Wayne, Amy, Jim

FISH #	SWEEP #	SPECIES	LENGTH	(WET WEIGHT – grams)
1	1	Brook Trout	240mm	188
2	1	Brook Trout	155mm	43
3	1	Brook Trout	135mm	24
4	1	Brook Trout	168mm	64
5	1	Brook Trout	162mm	65
6	1	Brook Trout	75mm	4
7	1	Brook Trout	190mm	72
8	1	Brook Trout	78mm	5
9	1	Brook Trout	175mm	72
10	1	Brook Trout	80mm	6
11	1	Brook Trout	195mm	90
12	1	Brook Trout	145mm	36
13	1	Brook Trout	150mm	50
14	1	Brook Trout	148mm	47
15	1	Brook Trout	170mm	60
16	1	Brook Trout	70mm	3
17	1	Brook Trout	60mm	3
18	1	Brook Trout	135mm	26
19	1	Brook Trout	165mm	52
20	1	Brook Trout	165mm	55
21	1	Brook Trout	160mm	50
22	1	Brook Trout	150mm	45
23	1	Brook Trout	150mm	49
24	1	Brook Trout	145mm	32
25	2	Brook Trout	200mm	142
26	2	Brook Trout	185mm	90
27	2	Brook Trout	145mm	42
28	2	Brook Trout	195mm	100
29	2	Brook Trout	135mm	26
30	2	Brook Trout	165mm	62
31	2	Brook Trout	87mm	6
32	2	Brook Trout	225mm	124
33	2	Brook Trout	145mm	38
34	2	Brook Trout	128mm	20
35	3	Brook Trout	225mm	128
36	3	Brook Trout	132mm	30
37	3	Brook Trout	70mm	6
38	3	Brook Trout	137mm	30

SWEEP #	TIME (sec)	FISH ALIVE	FISH DEAD
1	284	24	0
2	164	10	0
3	148	4	0

Total fish: 38 – all alive