

Shelly Creek Smolt Trap 2012

Introduction:

Shelly Creek is formed near the base of Little Mountain in Parksville, B.C. It flows northeast into the Englishman River, approximately 2km from the Strait of Georgia. The confluence is located 200m upstream of the Island Highway Bridge. This channel is approximately 10km long, including its headwater ditches and tributaries. The lower reaches of Shelly Creek have been negatively impacted by agriculture and urbanization in the area. There are resident cutthroat trout found in Shelly Creek throughout the entire length of the stream. Cutthroat migration is now limited because of several man-made obstructions. Anadromous access ends 1000m from the confluence, where there is a 5m high waterfall.

The 2012 trap project was funded through a DFO Public Involvement Program with support from DFO Community Advisor, Dave Davies. The project was coordinated by the Mid Vancouver Island Habitat Enhancement Society (MVIHES) and supported by its volunteers and members of Qualicum Beach Streamkeepers Society.

Objectives:

This report covers the installation and operation of the Shelly Creek smolt trap in 2012.

Methods:

The smolt trap was installed approximately 200m upstream from the confluence with the Englishman River (Fig. 1). It was placed downstream of the Martindale Road culverts, which drain an upstream pond. The purpose of this location was to ascertain the anadromous use of this channel during months of high flow.

Figure 1. Shelly Creek, Parksville BC Trap Location



A V-weir trap design was decided upon for this site. The site was cleared of twigs and branches and prepared for trap installation. The trap (constructed by volunteer, Pat Vek) was composed of wood panels placed in the bed of the creek. The panels were 4 feet high and 6 feet long and composed of a 2x4 wooden frame covered with ¼ inch galvanized mesh (Fig. 2). The trap was anchored into the streambed via sandbags and wooden backstays. Plastic sheets were placed on the streambed and covered with gravel to encourage all of the water, as well as fish, to pass through the trap.

The panels were angled to allow smolts to enter a 6 inch collection pipe located in the middle of the trap. The pipe discharged into a 4ft x 6ft wooden trap box. Inside the trap box a shelf was built to hold inventory supplies. A raft was also installed within the trap box for captured amphibians to crawl on top of before they were released. The water velocity of Shelly Creek was not high enough to require baffles inside the trap box. During trap inspections the screens were cleaned to prevent build up of debris, a common cause of trap failure. A deck was built for the storage of counting pails. Access to the trap was improved with the construction of steps as well as a guide rope. The sign located next to the trap was installed by MVIHES.

Figure 2. Shelly Creek Smolt Trap 2012

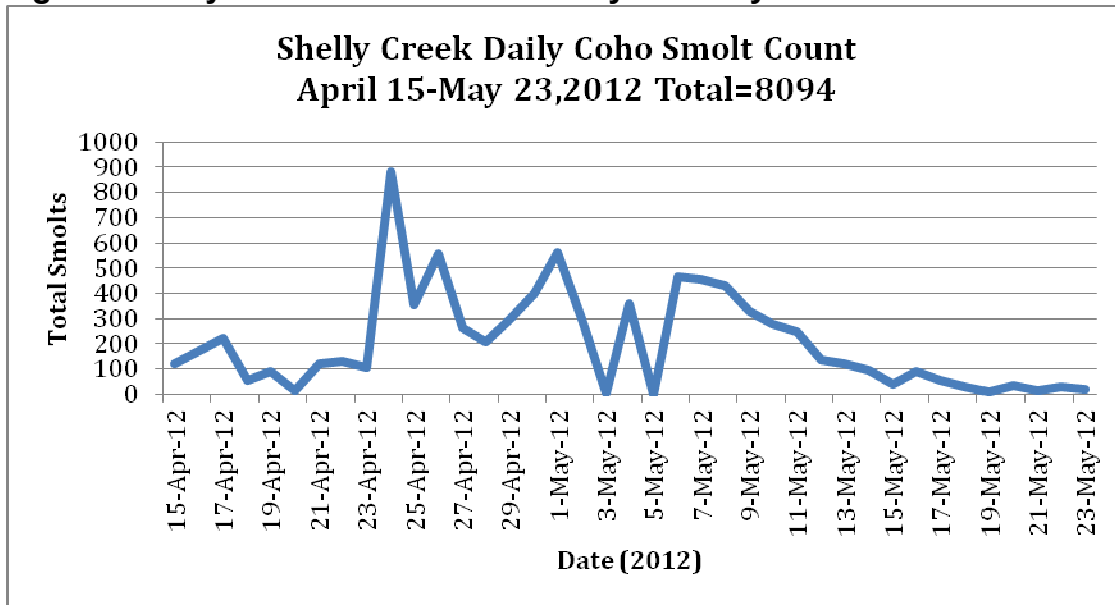


The trap box was checked daily by teams of volunteers. Daily inventory and fork lengths were recorded for coho smolts. Numbers were also recorded for rainbow and cutthroat trout, sculpin and stickleback. Water level and water and air temperature data were recorded.

Results:

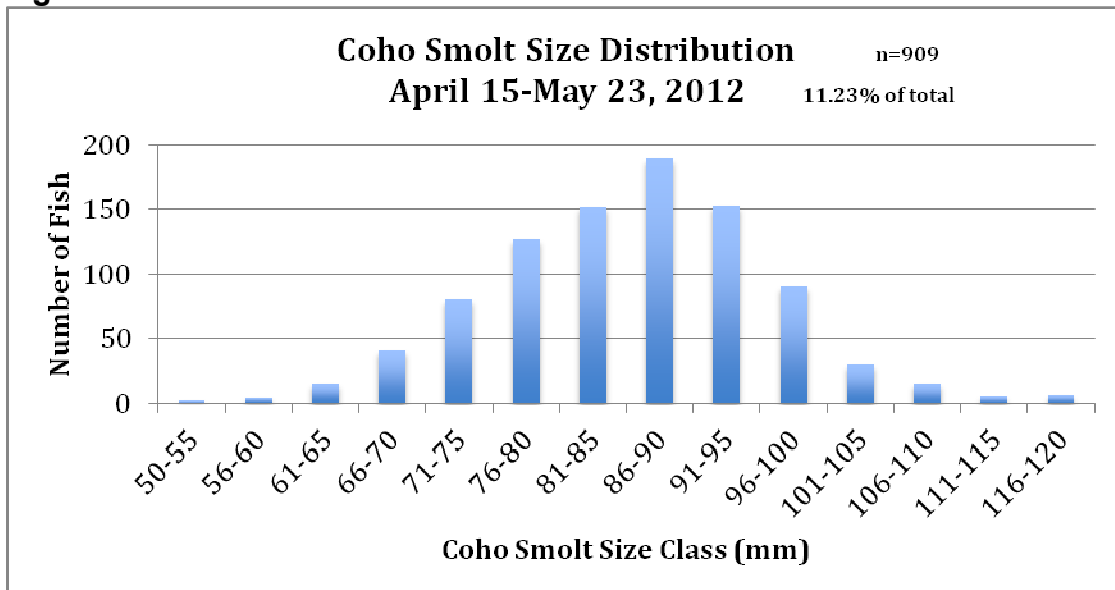
Smolt Numbers: The trap was in operation between April 15th and May 23rd, 2012. Total fish counted during this period was 8473. Total counts for Coho smolts were 8094. There were 42 trout (both rainbow and cutthroat) caught in the trap during this time. The maximum count was on April 24th with 884 smolts counted in the trap (Fig. 3).

Figure 3. Daily Salmonid Smolt Inventory at Shelly Creek



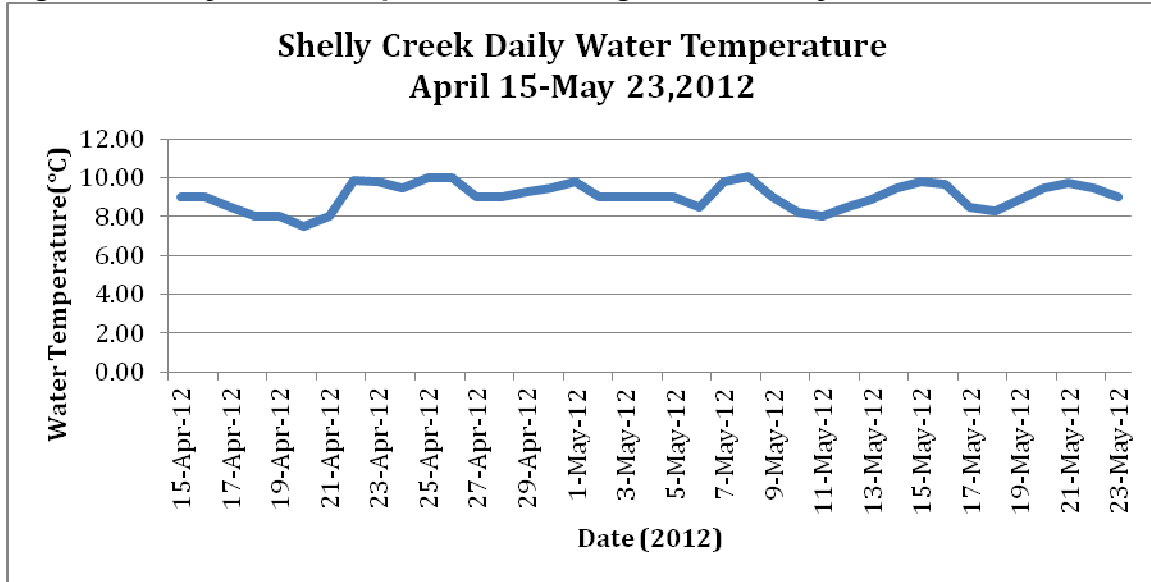
Fork Lengths: Figure four shows the size distribution of Coho smolts captured in the trap on Shelly Creek, between April 15th and May 23rd, 2012. The fork lengths were taken each day with a minimum of 20 fish, fewer if fewer fish were captured. In total, fork lengths of 909 Coho smolts were measured. The greatest population of fish fell into the 86mm to 90mm with 189 fish. One hundred fifty three fish fell into the 91mm to 95mm size class and 152 fish in the 81mm to 85 mm size class.

Figure 4. Coho smolt size distribution



Temperature: Figure five shows daily water temperature readings for Shelly Creek between April 15th and May 23rd, 2012. The peak temperature was 10.1°C on May 8th, 2012. The average temperature for this period was 9.06°C.

Figure 5. Daily water temperature readings from Shelly Creek



Oxygen: Appendix 1 shows the dissolved oxygen readings taken over the period of the trapping. Levels dropped from 7.3ppm to below 4 ppm in mid May. The standard level of comfort for Coho is above 6.5 ppm. Levels below 6.5 ppm can result in mortality if fish are also stressed. Levels below 3ppm will kill all Salmonids.

Discussion:

Thanks to the help of members and friends of MVIHES, the 2012 smolt trap was extremely successful. Data collected during this time was accurate and plentiful, building upon a strong foundation that began in 2011. This year, the fork length measurements that were taken were very helpful in determining the majority size of smolts that were making a downstream migration.

The 2012 total of 8,094 Coho smolts captured (5,456 more smolts than 2011) suggests that the lower reaches of Shelly Creek make for more than adequate spawning habitat and also that Shelly Creek provides important overwintering habitat from the main-stem of the Englishman River during high flow conditions. This was the second year that the trap was in place on Shelly Creek. As it is important to gather at least three years of data on wild fish populations, plans for a smolt trap on Shelly Creek for 2013 have been made.

Acknowledgements:

The Mid Vancouver Island Habitat Enhancement Society and DR Clough Consulting would like to thank volunteers Brad Jackson, Gord Almond, Chuck Sigmund, Pat Vek, Carl Rathburn, David James, Ian McGregor, Lauren Fegan and Andrew Hedderly for making this project possible.

Appendix 1. 2011 Shelly Creek Smolt Trap Data

Date	Salmon	Rainbow	Cutthroat	Sculpin	Stickle Back	Total Fish	Air Temp. degrees C	Water Temp. degrees C	Water Level meters	Do mg/L
	Coho									
15-Apr-12	121	3	6	3	6	139		9.00	0.17	
16-Apr-12	173	11	1	5	9	199		9.00	0.23	7.30
17-Apr-12	221			3	8	232	6.50	8.50	0.20	
18-Apr-12	57			3	9	69		8.00	0.17	
19-Apr-12	89			3	5	97	8.00	8.00	0.26	
20-Apr-12	16				16	32	5.00	7.50	0.16	
21-Apr-12	122				8	130	9.00	8.00	0.20	
22-Apr-12	129	3			3	135		9.90	0.15	
23-Apr-12	104	1		1	3	109	10.50	9.80	0.16	
24-Apr-12	884	5		2	8	899	10.00	9.50	0.15	5.50
25-Apr-12	352			1	8	361	10.00	10.00	0.19	
26-Apr-12	555	5			7	567	9.80	10.00	0.19	
27-Apr-12	265			2	8	275	7.00	9.00	0.16	
28-Apr-12	206			5	5	216	9.00	9.00	0.15	
29-Apr-12	297				7	304		9.25	0.15	
30-Apr-12	401	2		1	4	408	9.50	9.50	0.15	
01-May-12	560			2	9	571	8.50	9.80	0.14	
02-May-12	296			2	8	306	10.00	9.00	0.14	
03-May-12	4					4		9.00	0.15	
04-May-12	359	1			1	361	6.00	9.00	0.16	
05-May-12	1	1			1	3		9.00	0.12	
06-May-12	465			2	6	473		8.50	0.14	
07-May-12	457			1	11	469		9.80	0.14	
08-May-12	431	1		4	13	449	11.00	10.10	0.12	
09-May-12	329				5	334	9.00	9.00	0.13	
10-May-12	278	1		4	8	291	9.00	8.20	0.12	
11-May-12	247			1	5	253	6.00	8.00	0.10	
12-May-12	134			2	8	144	11.00	8.50	0.10	
13-May-12	123			1	16	140	11.00	8.90	0.09	
14-May-12	95				17	112	14.00	9.50	0.09	
15-May-12	41				11	52	13.00	9.80	0.09	
16-May-12	92				5	97	12.50	9.70	0.08	
17-May-12	53			1	8	62	10.00	8.50	0.08	
18-May-12	27			1	4	32	8.00	8.30	0.08	
19-May-12	11				2	13	12.00	8.90	0.06	3.90
20-May-12	34			1	15	50	10.50	9.50	0.08	3.70
21-May-12	16			2	6	24	11.00	9.75	0.08	4.10
22-May-12	31				9	40	10.50	9.50	0.05	4.10
23-May-12	18		1		2	21	10.00	9.00	0.08	4.40
Totals:	8094	34	8	53	284	8473				