Millard Creek Rearing Channel
Fish Habitat and Productivity Report 2008

Millard Piercy Watershed Stewards **K. Campbell July 2011**

Millard Piercy Watershed Stewards

Millard-Piercy Watershed Stewards is a non-profit organization with a mission to assess, restore, and maintain the ecosystems of the Millard-Piercy Watershed. We strive to promote community stewardship to help ensure long-term watershed protection to the benefit of both people and the natural environment.

We accomplish this by creating rewarding work opportunities for our volunteers that also help us to collect valuable information on the watershed, educating the community on the watershed and issues that affect it, taking action to protect the watershed against harmful activities, and undertaking restoration and enhancement activities that directly benefit fish and wildlife.

Millard-Piercy Watershed Stewards

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Youth and Ecological Restoration

The Youth and Ecological Restoration Program provides youth under nineteen, who are struggling with a variety of issues in their lives, with one-on-one work experience, training and support.

Youth work with community members to restore the environmental health of local watersheds. Through this work youth learn social, communication and community building skills that will support them in becoming confident, respectful and productive members of our society.

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Millard Creek Rearing Channel

The Millard Side Channel was constructed by the Millard Piercy Watershed Stewards in 2006 and 2007. Located on the property of three private landowners the side channel provides stable rearing habitat for coho salmon and cutthroat trout. The banks of the channel are vegetated with a mixed forest and the channel is complexed with natural features.

Inflow to the rearing channel is from Millard Creek and there are no barriers to salmon migration located between the channel and the Courtenay estuary. Water quality and quantity in the channel is maintained year-round within the range suitable for salmonids.

Figure 1: The Millard Side Channel is located upstream of the confluence of Millard and Piercy Creeks.

Millard Channel Mark Recapture Study

The productivity of the Millard Side Channel was evaluated with a mark recapture study undertaken in August 2008. Ten minnow traps baited with salmon roe were set along the length of the channel and left overnight. On the second day they were checked and then the traps were reset and checked on the third day.

The effectiveness of the traps is affected by:

- Location that traps are set
- Depth of the trap
- Trap orientation to current
- Bait type, freshness
- Time of day that trap is fishing
- Environmental conditions

YER participants doing fieldwork at Millard Side Channel

Figure 3. Youth and Ecological Restoration participants included the evaluation of the Millard Side Channel as part of their 2008 fieldwork program.

The Millard Side Channel increases the amount of suitable rearing habitat available in this urban watershed. It also offers educational opportunities for youth interested in learning environmental monitoring skills.

Repetition of the rearing channel study in 2011 will strengthen the data set available for the system and will provide a second opportunity for youth to participate with the MPWS in evaluating the success of this fish habitat restoration project.

Environmental data was collected at the times that the traps were set and checked.

Millard Side Channel Mark-Recapture Study

Environmental Data

	Day 1	Day 2	Day 3	Comments
Date	Aug 19.08	Aug 20.08	Aug 21.08	9:40
Crew	Wendy Kotilla and YER participants			
Weather	O'cast	O'cast	O'cast	
Air Temp	NA	NA	NA	
Rain past 24 hr	No	Yes	Yes	

Water Quality

	Day 1	Day 2	Day 3	Comments
Temp ^{o}C	14.8	13.6	12.8	
pH	8.17	8.19	8.34	
TDS	87	86	82	
Conductivity	NA	173	168	

Velocity and Discharge

	Day 2	Depths (cm)	Day 3	Depths (cm)	Comments
					Width 1.35 m
Time (secs)	26	11	24	13.0	
	31	15	18	12.5	
	24	15	21	13.0	
	38	10	11	9.5	
	31	6	30	8.0	
Average	30		20.8		
Velocity (m/s)	0.33		0.48		
	Aug 20.08		Aug 21.08		
	9.15		8:45		

Average velocity = 10 m/sec

Table 1. Environmental data collected in the Millard Side Channel.

Fish habitat data was collected at each of the sites.

Millard Side Channel Mark-Recapture Study
Habitat Informatio

Location #	Habitat Type	(cm) Depth 1	(cm) Depth 2	(cm) Depth 3	(cm) Depth 4	(cm) Depth 5	Wetted Width (m)	Channel Width (m)	Residual Depth (cm)	Comments
1	Pool	19.5	30.5	40.0	35.0	30.7	3.41	5.10	75	
2	Pool	13.0	17.0	17.0	22.0	19.0	2.35	3.35	12	
3	Cutbank	14.0	17.0	14.0	12.0	5.0	1.30	1.54	10	
4	Glide	15.0	16.0	12.0	12.5	8.5	1.65	1.65	6	
5	Pool	12.0	16.0	12.0	9.0	11.0	2.20	2.90	NA	End of glide into the pool
6	Pool	11.0	40.0	49.0	26.0	20.0	2.62	3.50	34	
7	Glide	8.0	11.0	18.0	15.0	12.0	1.85	4.80	12	
8	Pool	30.0	38.0	34.0	17.5	6.0	4.00	4.90	20	
9	Pool	16.0	20.0	20.0	16.0	9.0	2.00	3.30	8	
10	Pool	17.0	21.0	25.0	24.0	15.0	2.20	4.48	27	

Table 2. Fish habitat types recorded along the Millard Side Channel.

Millard Side Channel Mark-Recapture Study
Gee Trap Set and Check Times
Depth of Trap Variable

Trap #	Trap Depth (cm)	Date Trap Set	Time In	Date Checked & Reset	Time Checked & Reset	Trap Depth (cm)	Date Checked	Time Checked & Reset	Trap Depth (cm)
1	45	Aug 19.08	11:05	Aug 20.08	9:45	45	Aug 21.08	9:45	42
2	26	Aug 19.08	11:30	Aug 20.08	10:15	20	Aug 21.08	10:03	22
3	19.4	Aug 19.08	11:55	Aug 20.08	10:25	17	Aug 21.08	10:20	19
4	14	Aug 19.08	12:16	Aug 20.08	10:51	14	Aug 21.08	10:30	15
5	17	Aug 19.08	12:41	Aug 20.08	11:23	15	Aug 21.08	10:49	16
6	40	Aug 19.08	13:00	Aug 20.08	12:06	38	Aug 21.08	10:58	42
7	19	Aug 19.08	13:25	Aug 20.08	12:31	17	Aug 21.08	11:40	16
8	35	Aug 19.08	13:40	Aug 20.08	12:36	37	Aug 21.08	11:48	33
9	23	Aug 19.08	13:55	Aug 20.08	12:55	22	Aug 21.08	12:15	22
10	23.5	Aug 19.08	14:13	Aug 20.08	13:11	24	Aug 21.08	12:35	20

Table 3. Depth and timing for trap setting and checking

Captured fish were anesthetised with Alka Seltzer®, weighed and measured and marked with a small clip to the caudel fin before being released to the same area of the channel that they were captured from.

Millard Piercy Watershed Stewards
Length/Weight Data

Max		**86.0**	**7.63**	**1.77**			**Max**	**185.0**	**31.41**	**1.22**
Min		**51.0**	**1.56**	**0.82**			**Min**	**46.0**	**1.10**	**0.28**
Mean		**70.5**	**4.34**	**1.19**			**Mean**	**104.8**	**12.81**	**0.97**
				Condition						**Condition**
	Trap	**Length**	**Wgt**	**Index**			**Trap**	**Length**	**Wgt**	**Index**
Coho	**#**	**(mm)**	**(gm)**	**Kc**		**Cutthroat**	**#**	**(mm)**	**(gm)**	**Kc**
1	1	73	4.21	1.08		1		106	11.50	0.97
2	1	73	4.01	1.03		2	1	185	17.61	0.28
3	2	51	1.56	1.18		3	2	122	16.57	0.91
4	4	52	2.49	1.77		4	3	138	26.53	1.01
5	4	64	3.32	1.27		5	3	100	11.01	1.10
6	4	67	3.81	1.27		6	4	46	1.10	1.13
7	6	85	7.11	1.16		7	4	55	2.03	1.22
8	6	69	4.02	1.22		8	8	98	8.38	0.89
9	6	67	3.72	1.24		9	8	141	31.41	1.12
10	6	67	2.48	0.82		10	9	57	1.91	1.03
11	8	74	4.42	1.09						
12	8	76	5.63	1.28						
13	8	83	6.36	1.11						
14	8	86	7.63	1.20						

Table 4. Length, weight and condition indices of fish captured.

Fish Condition Index

Fish condition index (K) was calculated using the following formula:

$K = [(\text{body weight (g)} \times 100)/\text{length (mm)}^{3}]$

Fry and smolts in good condition will have a K value approximately equal to 1. The K value will be less than 1 for fish that are underweight for their size and fish with K values > 1 have a larger body mass than typical for healthy wild fish. Hatchery fry may exhibit this condition. Wild fish with K values <1 indicate that fish are underfed and that the habitat is over utilized.

2011 Millard Channel Mark Recapture Study Plan

Data collected in 2008 suggests that fish are surviving well and that the Millard Rearing Channel is providing valuable fish rearing and refuge habitat. During 2011 fish habitat technicians intend to return to the site to complete a second mark-recapture study.

Methods used in the 2011 study will be similar to methods used in 2008 and will also include georeferencing of trap sites so that the study can be easily repeated in future years.

Information on riparian vegetation and a calculation of population density of fish utilizing the channel will also be included in the 2011 report.

Water temperatures being recorded in 2011 are several degrees lower than temperatures recorded in 2008. This is true for many watersheds on Vancouver Island.

In order to match environmental conditions found in the channel in 2008. Project planners intend to complete the study during the last week of August 2011.