MISSION CR. ADULT COHO ENUMERATION AND TRANSPORT PROGRAM

1998 PROGRAM REPORT

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Acknowledgements

The Bulkley Morice Salmonid Preservation Group and the Chicago Creek Community Environmental Enhancement Society would like to thank the following individuals and groups for assistance during this program :

- DZE L K'ANT Friendship Centre for providing the Environment team to assist with adult capture, adult sampling, adult transport and egg takes
- Dept. of Fisheries and Oceans Canada for providing bio/technical support for this project
- Mel Burge for volunteering his time to assist with broodstock capture
- Conservation and Protection Branch (DFO) for assistance during adult capture and sampling
- Fisheries Renwal B. C. for co-funding this project
- Ministry of Transportation and Highways for project funding as per agreement with DFO

Mission Creek Adult Coho Program
1998 Program Report

Introduction

Mission Creek(Station Creek) is a small salmon bearing stream with headwaters in the District of New Hazelton Community Watershed. Mission Creek enters the lower Bulkley River downstream of Hagwilget Canyon. The creek is impacted by industrial(chipper mill, fuel depot) and residential development, transportation corridors (Highway #16 and CN Railway) and the withdrawl of water by the District of New Hazelton. There is an impassable highways culvert (Highway #16) west of New Hazelton that presents a height and velocity barrier to upstream migrating salmon.

The New Hazelton Elementary School, Waterfalls Creek Stream Rehabilitation Project and the Chicago Creek Community Environmental Enhancement Society have been conducting monitoring activities and coho salmon enhancement programs on the creek for several years now. Those groups have been involved in water quality monitoring, periodic aquatic insect monitoring, adult coho counts, juvenile presence/absence monitoring and adult coho counts. The purpose of the monitoring and enhancement activities is to restore historical salmon runs and to increase public education and awareness of the salmon resource.

In the fall of 1998, the Chicago Creek Community Environmental Enhancement Society and the Waterfalls Creek Stream Rehabilitation Project became members of a conglomerate group called the Bulkley Morice Salmonid Preservation Group. The Chicago Creek Community Environmental Enhancement Society applied for funding from Fisheries Renewal B.C. to operate a coho adult counting fence on Mission Creek. The Ministry of Transportation and Highways, under Habitat Inspectors Order (Fisheries and Oceans Canada) also contributed funding to this project.

A broomstick fence was constructed and installed in early September 1998. Coho capture and counting occurred from early September to November 1, 1998. The purpose of the counting fence system was to enumerate coho adults returning to Mission Creek and to transport a proportion of the returning adults above the impassable culvert.

Fence Construction, Installation and Operation

The fence consisted of two parts. A lower fence with a V-notch type lead in and an upper broomstick fence that was impassable to upstream migrating adults. The fence was contructed of two by six lumber frames with one inch holes drilled into top and bottom of the frames, at two inch centres. Wooden broomsticks were placed in the holes so that adults could only get through at the location of the V-notch lead-in. When the water was low, one of the panel sections was constructed such that it could be flipped up. When the water was low the coho preferred to go through this flipped-up section rather than use the V-notch lead-in.

Fence Construction, Installation and Operation Continued

A portable holding pen was placed between the two fences. When coho entered the area between the two fences, they would hold in a small pool area with some woody debris cover.

The crew would then net the coho from the holding pool using soft meshed dipnets and place them in the holding pen. Once the coho holding between the two fences had been transferred to the holding pen, biological sampling of the adults would be conducted.

Sampling included the following :

- Sex
- Nose-fork length
- Scales
- Mark type
- DNA sample by opercular punch

Refer to Table I for sampling information. Refer to Table II for summary information.

The fence was attended to several times daily and in the evenings. Debris was cleaned off both fences and the holding pool checked for presence of coho adults. When debris load against the fence increased during periods of heavy rainfall and/or snow melt, the fence was tended twenty-four hours per day. A small travel trailer was available for the crew to use as a residence during those times. A generator and safety lighting system were also on-hand for night-time work at the fence.

The fence was removed on November 1, 1998 and is in storage at the Chicago Creek Hatchery, South Hazelton, B.C..

Adult Transport and Egg Deposition

Coho adults were transported via three quarter ton, flat-deck, four wheel drive truck with a 100 gallon holding tank. The transport tank was supplied with medical oxygen using a welding cylinder type regulator and a diffuser air stone. Transport time from start of loading adults to last adult into the holding container at the hatchery was approximately one hour. The maximum number of adults transported in one tank load was twenty-two.

No mortality occurred during adult transport.

A total of 28 females and 37 males were counted. A total of 8 females and 11 males were released above the fence but below the impassable culvert. Estimated egg depostion below the culvert is 24,000 eggs. At biostandard levels of 0.008% survival to returning adults, the estimated adult production from this egg deposition would be 192 adults.

A total of 9 females and 26 males were released above the impassable culvert. Estimated egg deposition above the impassable culvert is 27,000 eggs. At biostandard levels of .008% survival to returning adult, the estimated adult production from this egg deposition would be 216 adults.

Note that returning adult means catch plus escapement. The number of adults that will be in the escapement is dependent upon exploitation rate.

A total of 11 females were used in hatchery egg takes. All males that were used in hatchery egg takes were returned live to the stream.

Adult Holding and Egg Takes

Adults that were held for hatchery broodstock were held in a seven foot diameter, green fiberglass circular tub. The tub had a tight fitting lid so that the coho were kept in complete darkness. The water flow was set at approximately 30 USGPM and the flow pattern was circular in a counter-clockwise motion. Water depth was maintained at about one metre. Water temperature during holding varied between 4.5 and 5.0 degrees Celsius.

Almost all of the coho used for broodstock were transported to the hatchery on October 2, 1998. The coho were first checked for ripeness on October 15'th and were checked approximately every 3 days after that. The first egg takes were conducted on October 21, 1998.

Coho held very well in the circular tub and there was no fungus growth on adults.

When coho adults were checked for maturity, the females would be netted out of the holding tub first. Each female was checked for ripeness and females that were not ripe were placed into a Capilano trough. Any females that were ripe (sexually mature), were killed with a blow to the head and hung and bled (head down, tail up). Once we had females on the bleeding rack, we would begin taking sperm from the males.

The males were dipnetted out of the holding tub, the area of the urogenital pore was dried, and the males were milked into whirlpack sperm bags. The whirlpack bags were immediately placed in a cooler until a sufficient number of males had been milked.

The females were stripped into clean, dry basins (one female per basin). The eggs were sampled by volume i.e. one 40 ml. sample of eggs was taken from each female and then the total volume of eggs was measured. Sperm from two males was added to the eggs and mixed in. The eggs were then fertilized, washed and loaded into Heath incubators at a loading of 6,500 to 8,500 eggs per tray.

Egg take information is included in Table III.

Eggs will be incubated to the swim-up fry stage in the Heath tray incubator.

TABLE I

Mission Creek Coho Adult Counts and Sampling 1998

Date	Species	Sex	N-F Len inches	N-F Len cms.	Mark Type	DNA Samples	Release Location	Scales
Oct 2/98	Coho	female	25	63.5	LMAX	yes	used for broodstock	85504 1-5
Oct 2/98	Coho	female	28	71.12	LMAX	yes	used for broodstock	85504 6-10
Oct 2/98	Coho	female	26	66.04	LMAX	yes	used for broodstock	75960 6-10
Oct 2/98	Coho	female	25	63.5	LMAX	yes	used for broodstock	75960 11-15
Oct 2/98	Coho	female	26	66.04	LMAX	yes	used for broodstock	75960 16-20
Oct 2/98	Coho	female	29	73.66	LMAX	yes	used for broodstock	75960 21-25
Oct 2/98	Coho	female	29.5	74.93	UNMARK	yes	used for broodstock	85505 31-35
Oct 2/98	Coho	female	23	58.42	LMAX	yes	used for broodstock	85505 36-40
Oct 2/98	Coho	female	28	71.12	LMAX	yes	used for broodstock	85505 41-45
Oct 2/98	Coho	female	24.5	62.23	LMAX	yes	used for broodstock	85505 46-50
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male		0			used for broodstock	
Oct 2/98	Coho	male					used for broodstock	
Oct 2/98	Coho	male					used for broodstock	
Oct 2/98	Coho	male					used for broodstock	
Oct 2/98	Coho	male					used for broodstock	
Oct 7/98	Coho	male	28	71.12	LMAX	yes	above fence/below culvert	
Oct 7/98	coho	female	27	68.58	LMAX	yes	above fence/below culvert	
Oct 7/98	coho	male	27	68.58	LMAX	yes	above fence/below culvert	
Oct 7/98	coho	female	25	63.5	No clip	yes	above fence/below culvert	
Oct 7/98	coho	male	28	71.12	LMAX	yes	above fence/below culvert	
Oct 7/98	coho	female	27	68.58	No clip	yes	above fence/below culvert	
Oct 7/98	coho	male	23	58.42	No clip	yes	above fence/below culvert	
Oct 7/98	coho	female	25	63.5	No clip	yes	above fence/below culvert	
Oct 7/98	coho	male	23	58.42	No clip	yes	above fence/below culvert	

TABLE I

Mission Creek Coho Adult Counts and Sampling 1998

Date	Species	Sex	N-F Len inches	N-F Len cms.	Mark Type	DNA Samples	Release Location	Scales
Oct 7/98	coho	male	26	66.04	No clip	yes	above fence/below culvert	
15-Oct	coho	female	25	63.5	No clip	yes	above fence/below culvert	
15-Oct	coho	male	28	71.12	No clip	yes	above fence/below culvert	
21-Oct	coho	female	25	63.5	No clip	yes	above fence/below culvert	
23-Oct	coho	female	27.5	69.85	No clip	yes	above culvert/Kal tire	85504 11-15
23-Oct	coho	female	27.5	69.85	LMAX	yes	above culvert/Kal tire	85504 16-20
23-Oct	coho	male	24	60.96	No clip	yes	above culvert/Kal tire	85504 21-25
23-Oct	coho	male	29	73.66	LMAX	yes	above culvert/Kal tire	85504 26-30
23-Oct	coho	female	25	63.5	LMAX	yes	used for broodstock	85504 31-35
23-Oct	coho	male	n/a		LMAX	no	above culvert/Kal tire	n/a
25-Oct	coho	female					used for broodstock	
25-Oct	coho	male					used for broodstock	
25-Oct	coho	male					used for broodstock	
27-Oct	coho	male	32	81.28	LMAX	yes	above culvert/New Hazelton	
27-Oct	coho	female	28	71.12	UNMARK	yes	above culvert/New Hazelton	85505 1-5
27-Oct	coho	male	31	78.74	Rventral	yes	above culvert/New Hazelton	85505 6-10
27-Oct	coho	male	32	81.28	LMAX	yes	above culvert/New Hazelton	85505 11-15
27-Oct	coho	female	26	66.04	LMAX	yes	above culvert/New Hazelton	
27-Oct	coho	male	28.5	72.39	LMAX	yes	above culvert/New Hazelton	
27-Oct	coho	male	27	68.58	UNMARK	yes	above culvert/New Hazelton	
27-Oct	coho	male	31	78.74	LMAX	yes	above culvert/New Hazelton	
	coho	male	32.5	82.55	UNMARK	yes	above culvert/New Hazelton	
28-Oct	coho	female			LMAX		above fence/below culvert	
28-Oct	coho	female			LMAX		above fence/below culvert	
28-Oct	coho	male			LMAX		above fence/below culvert	
28-Oct	coho	male			LMAX		above fence/below culvert	
28-Oct	coho	male			LMAX		above fence/below culvert	

TABLE I

Mission Creek Coho Adult Counts and Sampling 1998

			N-F Len	N-F Len	Mark	DNA		
Date	Species	Sex	inches	cms.	Type	Samples	Release Location	Scales
28-Oct	coho	male			LMAX		above fence/below culvert	
29-Oct	coho	female			LMAX		above culvert/New Hazelton	
1-Nov	coho	female			LMAX		above culvert/New Hazelton	
1-Nov	coho	female			LMAX		above culvert/New Hazelton	
1-Nov	coho	female			LMAX		above culvert/New Hazelton	
1-Nov	coho	male			LMAX		above culvert/New Hazelton	
1-Nov	coho	male			LMAX		above culvert/New Hazelton	

TABLE II Mission Creek Adult Coho Count Summary 1998

Date	Number of Females	Number of Males	Comments
Oct 2/98	10	12	transported to hatchery for broodstock
Oct 7/98	4	6	released above fence/below culvert
Oct 15/98	1	1	released above fence/below culvert
Oct 21/98	1	0	released above fence/below culvert
Oct 23/98	3	3	released above culvert/Kal tire N. Hazelton
Oct 25/98	1	2	used for broodstock/males released above
			culvert/New Hazelton
Oct 27/98	2	7	released above culvert/Kal tire N. Hazelton
Oct 28/98	2	4	released above fence/below culvert
Oct 29/98	1	0	released above fence/below culvert
Nov 1/98	3	2	released above fence/below culvert
Totals	28	37	11 females used for broodstock, all males
			returned to the system after spawning

TABLE III

Mission Creek Coho Egg Takes 1998

			Eggs per	Ttl. Volume	Ttl. Number		
Date	Female #	40 ml sam	mls.	mls.	of eggs	Tray #	
Oct 21/98	1	373	9.325	340	3171	10	
Oct 21/98	2	235	5.875	625	3672	10	6843
Oct 23/98	3	247	6.175	640	3952	11	
Oct 23/98	4	180	4.5	540	2430	11	
Oct 23/98	5	216	5.4	510	2754	11	9136
Oct 23/98	6	231	5.775	410	2368	12	
Oct 23/98	7	188	4.7	665	3126	12	5493
Oct 27/98	8	185	4.625	865	4001	13	
Oct 27/98	9	215	5.375	390	2096	13	6097
Oct 27/98	10	230	5.75	590	3393	14	
Oct 27/98	11	261	6.525	440	2871	14	6265
Totals					33832		
Mean eggs							
per female					3075.636		

Mission Creek Fence Construction

Gillnetting to Capture Adult Coho
At the Mouth of Mission Creek

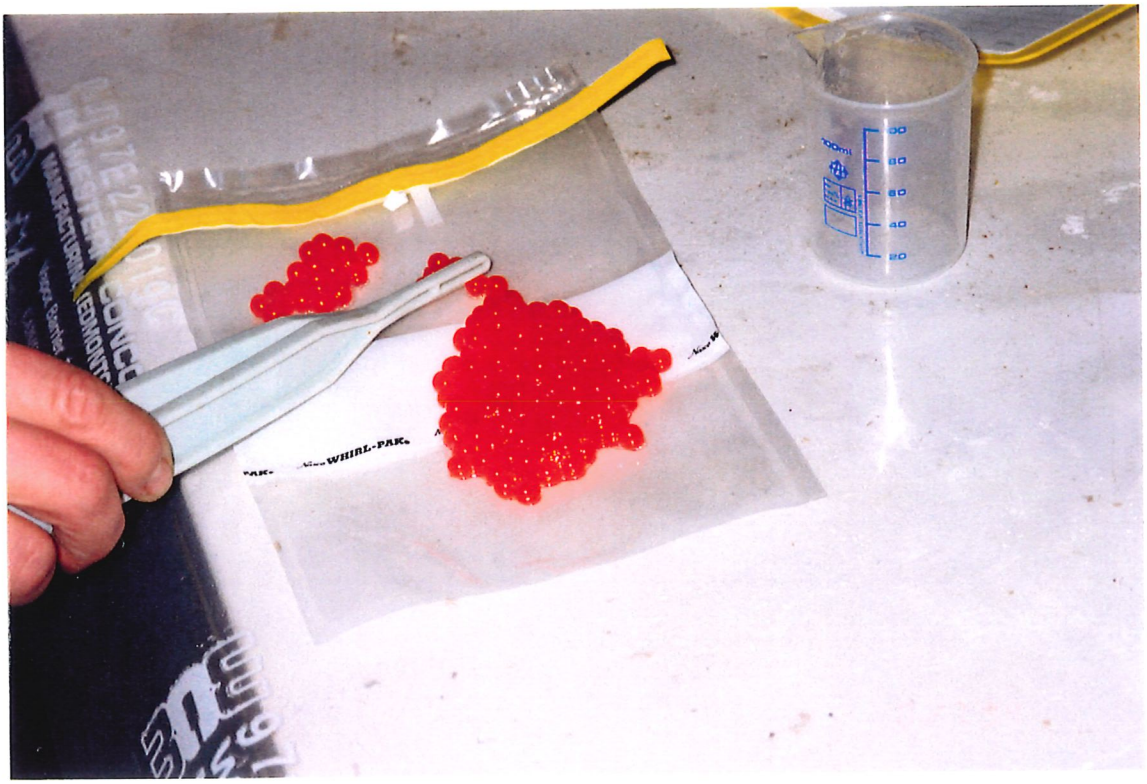
Hatchery Coho Captured in the Gillnet

Appendix 2. : Mission Creek Coho Egg Takes at the Chicago Creek Hatchery

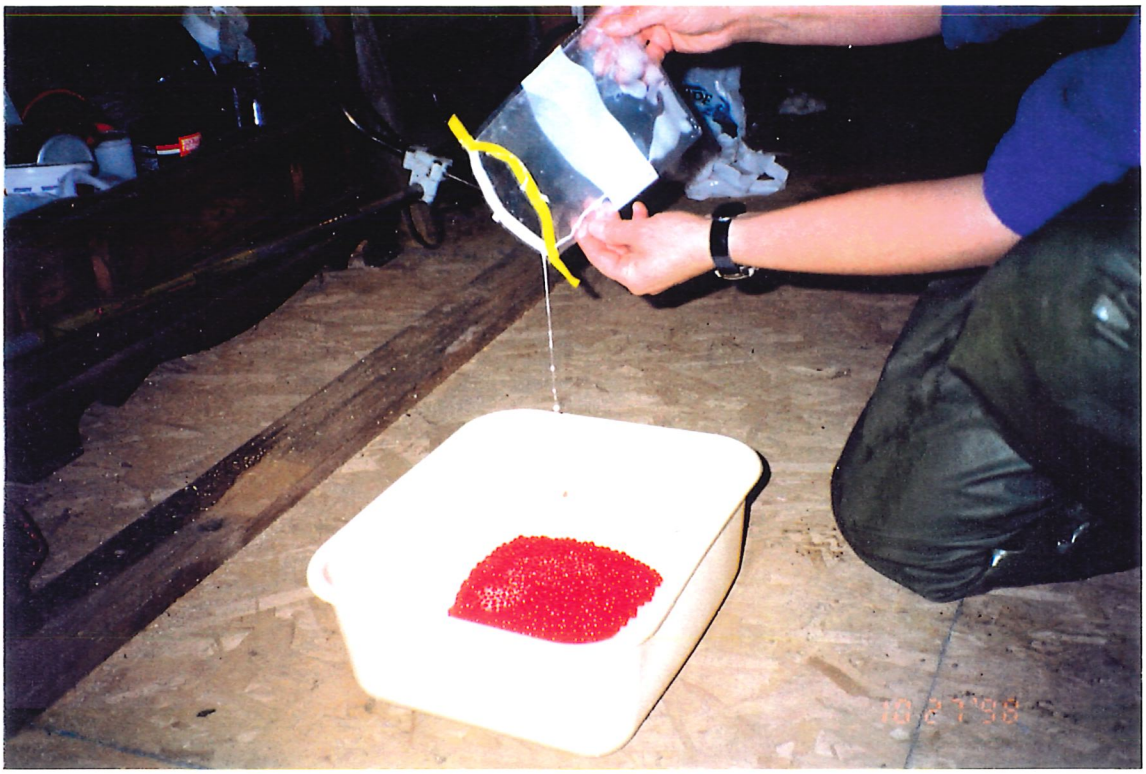
Bleeding the Females

Stripping the Females

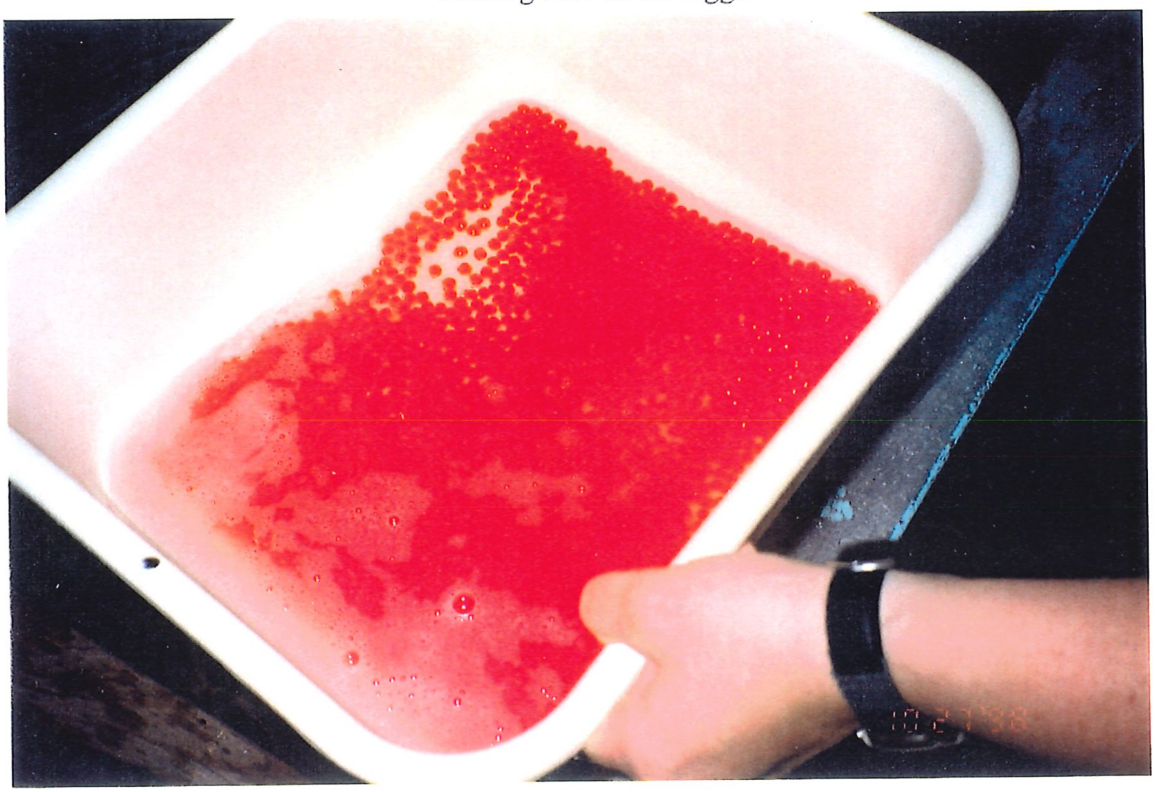
Expressing Milt from a Male Coho



40 ml. Sample of Eggs

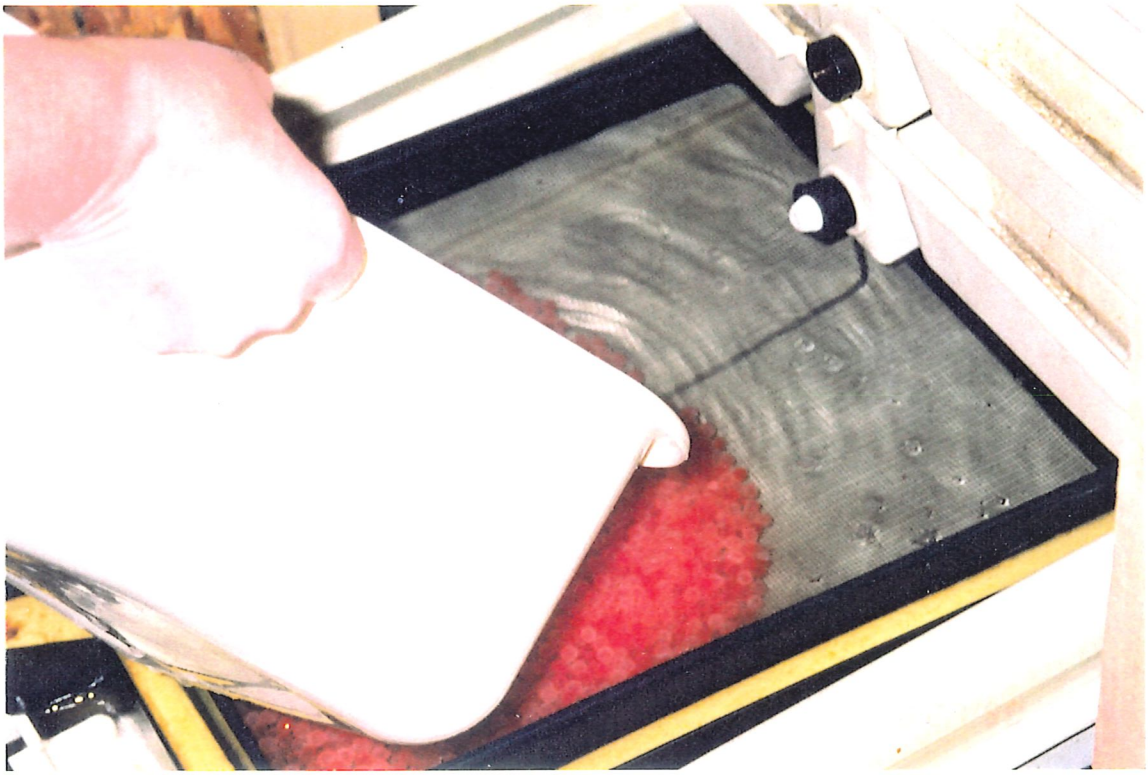


Adding Milt to the Eggs



Fertilizing the Eggs

Washing the Eggs



Loading Eggs into the Heath Stack Incubator

Maxillary Gland Present

Left Maxillary Mark(LMAX is missing)

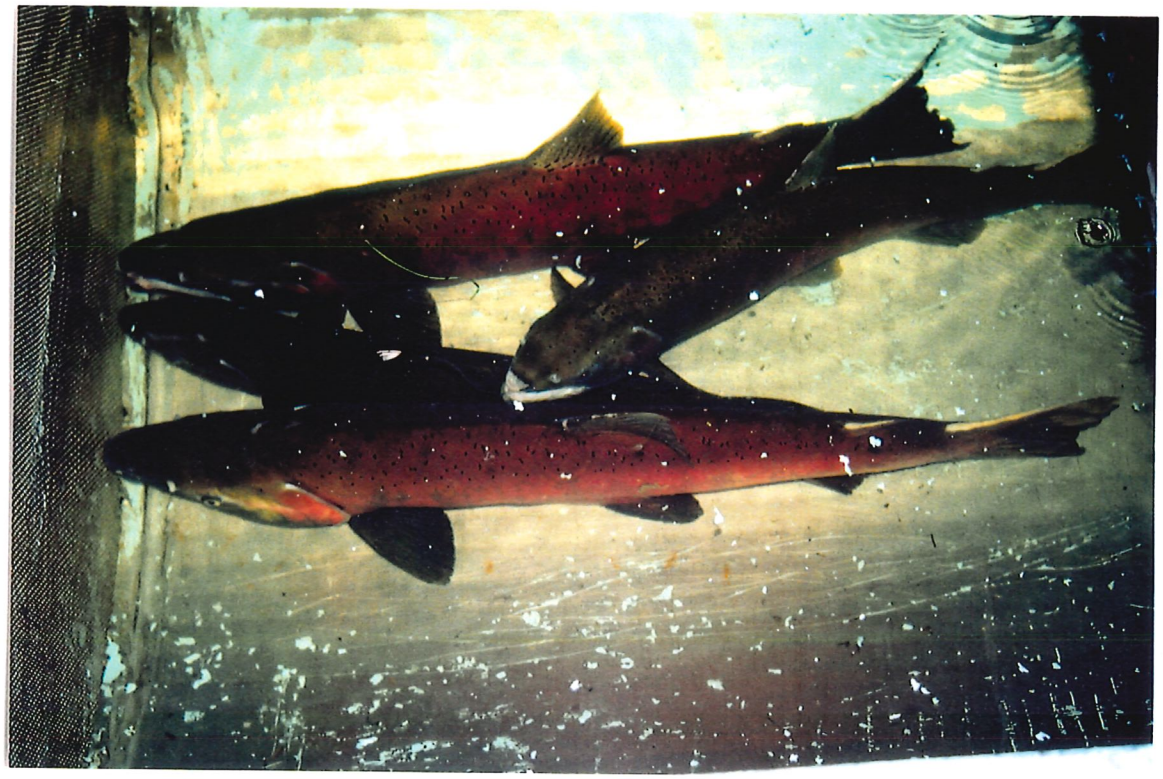
Mission Creek Fence Budget : Fall 1998

Date	Item	Cost $
15-Sep	labour to install fence	$ 1,640.00
15-Sep	labour to install fence	$ 110.50
15-Sep	labour to monitor fence	$ 348.50
15-Sep	mileage	$ 112.85
15-Sep	generator for lights	$ 1,074.08
15-Sep	Lumber for fence	$ 250.00
1-Sep	Hardware for fence	$ 133.17
1-Sep	Hardware for fence	$ 106.08
30-Sep	labour to monitor fence	$ 960.50
30-Sep	labour to monitor fence	$ 1,566.00
30-Sep	mileage	$ 358.00
15-Oct	labour to monitor fence	$ 188.79
15-Oct	trailer rental	$ 1,500.00
31-Oct	labour to monitor fence	$ 977.50
31-Oct	labour to monitor fence	$ 4,200.00
31-Oct	mileage	$ 337.81
31-Oct	trailer rental	$ 700.00
31-Oct	boat rental	$ 900.00
31-Oct	chest waders	$ 109.88
Total		**$ 15,573.66**

Cost	Summary
Labour	$ 9,991.79
Mileage	$ 808.66
Boat	$ 900.00
Trailer	$ 2,200.00
Hardware	$ 599.13
Generator	$ 1,074.08
Total	$ 15,573.66

Taking DNA samples before transporting adults above culvert

Releasing adult Coho above highway culvert



Holding pens at the hatchery
Capilano Trough

Circular Tub