

**MCINTYRE CREEK
SALMON INCUBATION PROJECT
2011-2012**

**YUKON RIVER SALMON RESTORATION AND
ENHANCEMENT FUND
Project # CRE-65-11**



May 2012 Final Report

Table of Contents

Abstract.....	3
Introduction.....	3
Ponding and Rearing.....	4
School and Community Involvement	4
Tagging	5
Releasing.....	5
Site Preparation.....	5
Security System	5
Brood stock Collection	6
Incubation	6
Monitoring and Maintenance.....	6
2011 Thermal Marking	7
Egg Picking.....	7
Adult Return Monitoring	7
Upcoming Season	7
Appendix 2: Tagging Dates and Codes Used - 2011 Released Brood stock.....	10
Appendix 3: Summary of Tagging	11
Appendix 4: 2012 Brood stock Collection Data.....	12
Appendix 5: Fox Creek Data from Whitehorse Rapids	13
Appendix 6: Phosphorus Lab Report.....	14
Appendix 7: Phosphorus Lab Report.....	15
Appendix 8: Financial Summary March, 2012.....	16
Appendix 8: Financial Summary March, 2012 cont.....	17
TOTAL	17

Abstract

The McIntyre Creek Salmon Project was administered by the Yukon Research Centre in 2011-2012. The Institute worked in partnership with Yukon College Renewable Resources Management students, DFO, 2 Yukon schools, Taan First Nation, Whitehorse Rapids Fish Hatchery, and various contractors to carry out its educational and salmon culture objectives.

Educational events and activities at the McIntyre site in 2011-2012 include a series of workshops on salmon and habitat for Yukon College students and a public Open House in celebration of Ocean's Day.

The project coded wire tagged and released 30,000 Chinook fry from the 2011 brood year and released 24,000 back to the Tatchun River system and 6,000 to the Fox Creek system between June 27th, and July 3rd, 2011.

5,000 eggs were taken from mature Chinook at Tatchun Creek in late August. Eggs and milt were transported on ice to the McIntyre site where each batch of eggs was mixed with the milt of at least two male Chinook and planted in heath stack incubation trays at the McIntyre site. October 27, 2011, 102,000 eyed Fox Creek eggs were donated to the McIntyre Incubation facility from Whitehorse Rapids Fish Hatchery to be incubated for the Taan First Nation Fox Creek restoration and enhancement project. An estimated 5,000 Tatchun Creek and 92,500 Fox Creek eggs were hatched. Fry will be ponded and re-enumerated at the McIntyre site in April 2012.

Introduction

The McIntyre Creek Salmon Project was administered by the Yukon Research Centre in 2011-2012. The Institute has worked with Yukon College Renewable Resources Management Diploma students, partner organizations and contractors to operate the site since the spring of 2002. Yukon College students were involved in all aspects of the project over the 2011-2012 operating season, from the ponding and rearing of the 2010 fry to the preparing for ponding of the 2011 fry.

The Department of Fisheries and Oceans provide additional guidance and technical advisory when required. Yukon College has continued to work with the students in class and at the site over the past academic year. The roles of the students, and particularly that of the student manager, have continued to grow as the students gained more skills and are in the processes of planning to take on more responsibilities as they proceed into their second (and final) year of their Renewable Resources Management Diploma program.

Ponding and Rearing

Yukon College students moved fry into Capilano troughs between late March and early April 2011. Student manager and student employees looked after the daily feeding and cleaning until the last of the fry were released in mid-August.

Flows in each of the troughs was initially set at 60 LPM and was gradually increased over the rearing period to about 100 LPM maximum from mid-May until the time of release.

Fish were sampled once per week to assess health status and food requirements (See Appendix 1). Food was distributed using 24 hour Ziegler belt feeder. Two feeders were installed per trough.

Capilano Troughs were cleaned daily using brooms and flow control to gently channel the settled solids to the tank outlet. The fish screen at the downstream end of the channel was cleaned daily to prevent breaching of the screen and back watering of the channel.

Skretting feed Crumble #0 and Crumble #1 has been purchased for the 2012 rearing season.

School and Community Involvement

Workshops: Fifteen Renewable Resource Management students are participating in a series of workshops about all aspects of the McIntyre project. 6 of these students have also been working on maintenance at the site and one of the students has been working as the project manager.

In collaboration with DFO, along with the Chinook broodstock, a small amount of chum salmon were incubated at the site. Both the chum and Chinook are used as a hands-on activity called the 'salmon in the classroom' project to help educate students on the life stages and life requirements of salmon. For the 2011-2012 season, salmon were distributed to elementary school classrooms at various life stages- eyed stage, alevin stage, and ponded/fry stage. In celebration of the life of the salmon, as an end of the school year activity students return fry to be released to the areas that they were collected as eggs and milt.

The Taan First Nation also host celebrated Fox Creek salmon fry release event with refreshments, handouts, displays, quizzes, and prizes at the site.

There has also been outside interest to utilize the incubation site for alternate research studies. Access Consulting has requested and been approved to utilize the incubation facility site for independent research purposes, outside of the objectives of the restoration and enhancement project.

Tagging

Renewable Resource student and co-manager Manon Fontaine conducted coded wire tagging in 2011. She tagged a total of 30,000 fish between June 18th and June 30th - 7200 Fox Creek fish and 23,000 Tatchun Creek fish.
(See Appendix 2)

In 2012 Yukon Research Centre purchased 100,000 Coded wire tags in preparation for tagging the progeny of the 2011 broodstock. Phyllis Nelson has been contacted to schedule tagging for early July 2012.

Releasing

The releases of fry grown from the 2010 broodstock were carried out late June and early July of 2011. The releases were carried out by the Yukon College student manager and staff.

23,000 fry were released at Tatchun Creek on June 27, 2011. Fry average weight of about 1.2 grams at release. 7000 fry were released into Fox Creek on July 3, 2011. They weighed about 1.2 grams average at the time of their release.
(See Appendix 3)

Site Preparation

Upgrades were made to the upper dam- attempts were made to reinforce side walls due to the slow degradation and bowing out of the walls which restrict the amount of water to be efficiently held back to supply the facility.

Upgrades were also made to the walkways and handrails were built along the walkway that crosses the creek between Capilano rearing troughs.

Security System

Absolute Security continues to monitor the alarm system. The project manager or his delegate carried a pager with text capability, the number of which was at the top of Absolute Security's alarm call-out list. This system is easily adapted to changing responsible personnel at the site. A cordless phone is on site to enable the worker to request assistance if/when required or in case of emergency.

Brood stock Collection

In 2011, Tatchun Creek Chinook broodstock were caught and collected between August 26th and August 29th. Most fish were captured through angling, as the high numbers of fish on the spawning grounds and in the pools made it difficult to net a small number at a time. It was also much easier to select suitable fish (ripe but not yet spent) through angling. Fish were held until ripe in PVC tubes, 8” in diameter and about 120 cm long, with clothesline barriers at each end.

Tubes were placed under cover to ensure that they were not visible to predation or vandalism. Water velocity through the tubes was minimized by using large rocks when eddies were not sufficient. About 5,000 eggs were taken from six females. Water temperature within Tatchun Creek during the period of broodstock collection was 18.0 degrees C on August 26th and August 29th.

One female was examined and thought to have been ripe, but upon egg collection procedures, it was found that eggs were not ready. Carcass was taken by DFO to contribute to further fecundity research studies. There were no additional incidental mortalities during broodstock collections. All males were released back into Tatchun Creek after milt collections were conducted.

(See Appendix 4)

Incubation

Each batch of Tatchun Creek eggs were fertilized at the McIntyre site with milt from at least two males and planted into heath trays in heath tray incubation housing shelters. Flow was set at approximately 9 LPM.

Fox Creek eggs were collected by Whitehorse Rapids Fish Hatchery at Whitehorse Rapids Fishway. Fox Creek eggs were fertilized at the Whitehorse Rapids Fish Hatchery site with milt from at least two males per female and planted into heath trays. Eggs were incubated at Whitehorse Rapids until the eyed stage, which at that time 102,500 Fox Creek eggs were transferred to the McIntyre Incubation site on October 27.

(See Appendix 5)

Monitoring and Maintenance

The Yukon College student manager and other students undertook regular checks of the site once the egg takes were completed. They visited the site daily to check temperatures and flows, as well as clean intakes.

Water samples have been collected from the groundwater channel, downstream of the Capilano troughs and fish screen, and immediately upstream of McIntyre Creek. No phosphate problems were detected. (See Appendix 6 and Appendix 7)

2011 Thermal Marking

Thermal marking was not conducted during the 2011-2012 season due to technical problems with the system. It is anticipated that a standardized system be developed to ensure successful and efficient thermal marking unit complete with detailed written procedures which can be used consistently on a year after year. Challenges of understanding upgrades and efficient uses of thermal units can pose as limitations to successful otolith markings.

Egg Picking

Yukon College student employees removed dead eggs from the trays between October 11th and December 23rd. Later egg picks were required due to the increased populations per tray increased fungus spread when dead eggs occurred. High mortalities occurred during the week of December 15-20 due to water flow issues.

About 24,900 eggs were estimated to have survived to hatch in the Tatchun River eggs- a survival rate of 92.1% from green eggs. About 92,500 eggs were estimated to have survived to hatch in the Fox Creek eggs- a survival rate of 90.6% from green eggs.

Adult Return Monitoring

The broodstock collection crew at Tatchun Creek captured and examined a total of 32 Chinook salmon- 16 males and 16 females. No fin clips, spaghetti tags, or external markings were noted.

Upcoming Season

Yukon College students have prepared the site for rearing, and plan to pond the 2011/2012 fry late March to early April. The food supply is on hand, and the tagger has been contacted.

Student manager, Yukon Research Centre, and various Yukon College trades instructors are planning major upgrades this upcoming summer to improve and replace: heath stack incubation shelters; piping and water flow deficiencies; construction of a secondary dam at the lower end in case first dam is breached; research and assess feasibility for complete upper dam replacement; reassess, upgrade, and add lighting to the electrical system; and, prepare for the upcoming broodstock collection season.

(For a summary of the costs related to the project see Appendix 8: Financial summary March 2012)



Appendix 1: Sample of Sampling Data Collected

08-juin-11

FOX CREEK

TATCHUN

#	length (mm)	weight (g)	K factor	#	length (mm)	Weight (g)	K factor
1	42	0.70	0.94	1	44	0.77	0.90
2	43	0.68	0.86	2	46	0.93	0.96
3	42	0.71	0.96	3	46	0.95	0.98
4	41	0.68	0.99	4	44	0.78	0.92
5	43	0.74	0.93	5	47	1.07	1.03
6	44	0.73	0.86	6	41	0.60	0.87
7	43	0.72	0.91	7	44	0.92	1.08
8	44	0.83	0.97	8	46	0.94	0.97
9	43	0.75	0.94	9	48	1.09	0.99
10	42	0.72	0.97	10	43	0.73	0.92
AVERAGE	42.7	0.726	0.93	AVERAGE	44.9	0.878	0.96

fry 3750

biomass (g) 2722.5

food qty (g/day) 54.45

#0 crumble

and sprinkle of #1

fry 11585

Biomass (g) 10171.63

food qty (g/day) 185.63

#1 crumble

Appendix 2: Tagging Dates and Codes Used - 2011 Released Brood stock

FROM MANON:		Maturity Tagging 2011									
Tagging for Tatchun Creek 2011											
June 18	Machine	start	end	Small	relax	Total	total	clip	Retention	Mort 24hr	comments
June 19	480	1446545	1446564	0	0	0	0	0	0	0	Test having problem with setting up
June 20	CHIN7	543727	543747	0	0	13	0	0	0	0	Test O tip not right depth wire stuck
June 21	CHIN7	543747	543757	0	0	3	0	0	0	0	Test
June 22	CHIN7	544833	544833	20	297	779	799	98	98	0	test on 2 fry both mort for observation
June 23	CHIN7	544833	544833	31	228	1521	1552	99	85	6	test on 5 fry
June 24	CHIN7	546582	546582	26	43	1823	1849	100	99	23	Chin stuck wire cant do anything about it
June 25	480	1446907	1446910	20	30	2373	2393	99	98	0	
June 26	480	1452943	1452943	55	37	2396	2453	99	99	2	
June 27	480	1453195	1453195	47	49	2106	2153	98	98	0	
total				2726	45	7409	8026	98	98	3	
						204	2990				
total				3542	726	20287	23813	98	71429	119	23894
tagging for Fox Creek 2011											
June 28	Machine	start	end	small	relax	total	total	clip	Retention	mort 24hr	comments
June 29	480	1462913	1462944	2304	9	2922	5226	98	99	1	51A02D11D22D38D46 1/2L
June 30	480	1465844	1467051	805	22	1185	1990	98	98	3	51A02D11D22D38D47 1/2L
total				3109	31	4107	7216	98	33333	4	
TOTAL				6651	757	24394	31029			123	

Appendix 3: Summary of Tagging

Project	Brood Year	Stock	Mark	Stage	Release Site	Start Date	End Date	Tagged #	# Ad Only	# Un-Marked	Total Rel.	WT. (gm)
McIntyre Ck./Fox Ck.	2010	Whitehorse Fishway	02-01-02-06-07 ^	Spring Fry	Fox Creek	07/05/2011	07/05/2011	1161	826	0	1987	1.2***
McIntyre Ck.	2010	Tachun Ck.	02-01-02-06-02 ^	Spring Fry	Tachun Creek	06/27/2011	06/27/2011	9378	152	0	9530	1.2
McIntyre Ck.	2010	Tachun Ck.	02-01-02-06-04 ^	Spring Fry	Tachun Creek	06/27/2011	06/27/2011	10594	3567	0	14161	1.2
McIntyre Ck./Fox Ck.	2010	Whitehorse Fishway	02-01-02-06-06 ^	Spring Fry	Fox Creek	07/05/2011	07/05/2011	2864	2362	0	5226	1.2***
McIntyre Ck./Fox Ck.	2010	Whitehorse Fishway	02-01-02-06-07 ^	Spring Fry	Fox Creek	07/05/2011	07/05/2011	1161	826	0	1987	1.2***

*** release WT estimated based on weight at sampling three weeks before release

^ fish numbers recorded, but allocation to tag code may be inaccurate due to poor record of tag wire change

Appendix 4: 2012 Brood stock Collection Data

Tatchun Creek Chinook Broodstock Collection for NRI								
Collectors: Davna Hope, Sean Collins, Elizabeth MacDonald								
Date	Sex	FL	MEFL	POHL	# of Eggs	Scale Card	Scale Numbers	Comments
Aug 26 2011	M	101.5	88	77		95741	1 to 41	
Aug 26 2011	M	87	77	70		95741	2 to 42	
Aug 26 2011	M1	90.5	82.5	73		95741	3 to 43	
Aug 26 2011	M2	71	62.5	56		95741	7 to 47	
Aug 26 2011	M3	94.5	82	70		95741	8 to 48	
Aug 26 2011	M4	77	68	58		95741	9 to 49	
Aug 26 2011	M	81	71	62		95741	10 to 50	
Aug 26 2011	M5	67.5	60	53		95742	1 to 41	
Aug 26 2011	F1	86.5	80	71	2172	95741	4 to 44	
Aug 26 2011	F	90	83	73		95741	5 to 45	
Aug 26 2011	F	87.5	80	70.5		95741	6 to 46	
Aug 26 2011	F2	90	84	74	299	95742	2 to 42	
Aug 26 2011	F3	93.5	86	73.5	551	95742	3 to 43	
Aug 26 2011	F4	93	85	77	50	95742	4 to 44	
Aug 26 2011	F7					95742	5 to 45	Unripe Female, eggs kept for fecundity
Aug 26 2011	F					95742	6 to 46	
Aug 26 2011	F					95742	7 to 47	
Aug 26 2011	F5	94	85	75	300	95742	8 to 48	
TOTALS:	8 males	10 females						
collected from:	5 males	5 females			3372			
Aug 29 2011	M 1	74	67.5	58		95743	1 to 41	
Aug 29 2011	M 2	76	68.5	59		95743	2 to 42	
Aug 29 2011	F1	78.5	71.5	64	300	95743	3 to 43	
Aug 29 2011	F2	99	89	77.5	350	95743	4 to 44	
Aug 29 2011	M	79	71	62		95743	5 to 45	
Aug 29 2011	M3	100	87.5	79		95743	6 to 46	
Aug 29 2011	M4	69.5	61.5	54		95743	7 to 27	
Aug 29 2011	M5	77	68.5	61		95743	8 to 48	
Aug 29 2011	M6	85	84.5	73.5		95743	9 to 49	
Aug 29 2011	M7	71	65	56.5		95743	10 to 50	
Aug 29 2011	F3	89	81	72	400	95744	1 to 41	
Aug 29 2011	F4	77	71	63	250	95744	2 to 42	
Aug 29 2011	F5	90.5	82	74	170	95744	3 to 43	
Aug 29 2011	F	87.5	80.5	73		95744	4 to 44	
Note F or M then a number means mlrt or eggs were collected. Were only an M or F is present nothing was possible to be collected aside from ASL.								
Approximate Green Eggs			4842					
TOTALS:	8 males	6 females						
collected from:	7 males	5 females			1470			
TOTAL EGGS COLLECTED FROM TATCHUN CREEK:					4842			


Appendix 5: Fox Creek Data from Whitehorse Rapids

Estimated Number of Eggs - Chinook Salmon, Green Eggs to Ponding Moved To McIntyre														
2011-2012														
Egg Take Date	Stack#/ Tray #	Volume Total Eggs	Estimated Percent Fertilized	Estimated Total Fert Eggs	Total Green Eggs	Pre-eyed Picks	Development checks out of 10	Date of Inventory	Shocking Morts	Est. 2nd Inventory Total Eyed Eggs	Eyed to Hatch Morts	Total at Hatched Stage	Hatch to Ponding Morts	Total at Ponding
					for development checks					demonstrates hand counted				
26-Aug	3--1	1000	100%	1000	1855	65	80%	16-Oct	304	1486		1486		1486
28-Aug	4-1	4500	100%	4500	5563	21	100%	18-Oct	53	5489		5489		5489
28-Aug	4-2	4500	100%	4500	5474	16	100%	18-Oct	56	5402		5402		5402
29-Aug	4-3	4500	100%	4500	5749	12	100%	18-Oct	335	5402		5402		5402
29-Aug	4-4	4500	100%	4500	4470	463	70%	18-Oct	1294	2713		2713		2713
29-Aug	4-5	4500	100%	4500	6732	12	100%	18-Oct	23	6697		6697		6697
29-Aug	4-6	4500	100%	4500	4638	13	100%	18-Oct	16	4609		4609		4609
29-Aug	4-7	4500	100%	4500	6641	17	100%	18-Oct	40	6584		6584		6584
29-Aug	4-8	4500	100%	4500	5516	49	90%	18-Oct	442	5025		5025		5025
29-Aug	5-1	4500	100%	4500	6243	140	100%	18-Oct	227	5876		5876		5876
30-Aug	5-2	2500	100%	2500	4767	13	100%	18-Oct	30	4724		4724		4724
30-Aug	5-3	4500	100%	4500	5299	10	100%	18-Oct	16	5273		5273		5273
30-Aug	5-4	4500	100%	4500	7836	12	100%	18-Oct	68	7756		7756		7756
30-Aug	5-5	4500	100%	4500	5880	19	100%	18-Oct	37	5824		5824		5824
30-Aug	5-6	4500	100%	4500	7633	13	100%	18-Oct	50	7570		7570		7570
30-Aug	5-8	4500	100%	4500	6293	24	100%	18-Oct	150	6119		6119		6119
30-Aug	6-2	4500	100%	4500	7095	15	100%	18-Oct	25	7055		7055		7055
03-Sep	6-3	3500	100%	3500	4705	160	90%	19-Oct	500	4045		4045		4045
03-Sep	6-4	3500	100%	3500	4628	14	90%	19-Oct	163	4451		4451		4451
Totals			100%		107017	1088	95%		3829	102100		102100		102100

Appendix 6: Phosphorus Lab Report

Exova
 #104, 19675-55 A Ave.
 Surrey, British Columbia
 V3S 8P8, Canada

T: +1 (604) 514-3322
 F: +1 (604) 514-3323
 E: Surrey@exova.com
 W: www.exova.com

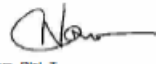
Page 1 of 2


Analytical Report

Bill To: Northern Research Institute Report To: Northern Research Institute Box 2799 Whitehorse, YT, Canada Y1A 5K4 Attn: Clint Sawicki Sampled By: Company:	Project: ID: McIntyre Creek Salmon Incubati Name: McIntyre Creek Water Location: LSD: P.O.: Acct code:	Lot ID: 801404 Control Number: Date Received: May 3, 2011 Date Reported: May 9, 2011 Report Number: 1429810
---	--	--

Reference Number	801404-1	801404-2	801404-3
Sample Date	May 01, 2011	May 01, 2011	May 01, 2011
Sample Time	14:30	14:30	14:30
Sample Location			
Sample Description	McIntyre Upstream of ground Water	McIntyre ground water downstream	McIntyre Upstream
Matrix	Water	Water	Water

Analyte	Units	Results	Results	Results	<small>Nominal Detection Limit</small>
Metals Total					
Phosphorus	Total	mg/L	<0.01	0.010	0.017
					0.01


Approved by: 
 Carol Nam, Dipl. T.
 Quality Officer

Terms and Conditions: www.exova.ca/terms&conditions

Appendix 7: Phosphorus Lab Report

Exova
 #104, 19575-55 A Ave.
 Surrey, British Columbia
 V5S 6P9, Canada

T: +1 (804) 514-3322
 F: +1 (804) 514-3323
 E: Sales@exova.com
 W: www.exova.com


Page 1 of 2


Analytical Report

<p>Bill To: Northern Research Institute Report To: Northern Research Institute Box 2799 Whitehorse, YT, Canada Y1A 5K4 Attn: Clint Sawicki Sampled By: Company:</p>	<p>Project: ID: McIntyre Creek Salmon Incubati Name: McIntyre Creek Water Location: LSD: P.O.: Acct code:</p>	<p>Lot ID: 812592 Control Number: Date Received: Jul 4, 2011 Date Reported: Jul 11, 2011 Report Number: 1450005</p>
--	---	--

Reference Number	812592-1	812592-2	812592-3
Sample Date	Jul 02, 2011	Jul 02, 2011	Jul 02, 2011
Sample Time	17:30	17:30	17:30
Sample Location			
Sample Description	McIntyre Dam	McIntyre Fish Screen	McIntyre Creek
Matrix	Water	Water	Water

Analyte		Units	Results	Results	Results	<small>Nominal Detection Limit</small>
Metals Total						
Phosphorus	Total	mg/L	0.011	0.025	0.039	0.01

Approved by: 
 Mathieu Simoneau
 Laboratory Operations Manager

Appendix 8: Financial Summary March, 2012

Total received from Yukon River Panel Project CRE-65-11 \$44,965.00

FINANCIAL SUMMARY			
I. PERSONNEL COSTS:			
Tagging, Egg Takes			
Site Monitoring/Feeding/Picking	\$14,053.09		
		\$14,053.09	
II. OPERATING COSTS:			
A. TRAVEL			
Egg takes, fly trapping and carcass surveys.	\$738.67		
		\$738.67	
B. MATERIALS, SUPPLIES, MAINTENANCE			
Construction/Plumbing/Electrical/Incubation Supplies, Tags, Tagging Equipment	\$17501.53		
Telephone	\$1,283.14		
Electricity	\$2,801.06		
Security (monitoring)	\$813.20		
Fish Food – Skretting	\$606.04		
Printing	\$113.08		
Licensing	\$30.00		
Freight/Postage	\$195.45		
		\$23,343.50	
C. COORDINATION:			
Coordination Fee (15%)	\$6,744.75		
		\$6,744.75	
SUB-TOTAL			
		\$44,880.01	
TOTAL			
			\$44,880.01

Appendix 8: Financial Summary March, 2012 cont.

OTHER SOURCES OF FUNDING, ASSISTANCE, AND/OR INFORMATION:

<u>Assistance</u>	<u>Amount of funding</u>
Yukon Research Centre: labour, administration, finance	\$10000 in kind
Y2C2: fry trapping labour, adult stream survey -5 or 6 person crews for 5 days=25 person days	\$2500 in kind
DFO: technical support and egg take assistance (for school program eggs) egg takes 20 person days	\$10000 in kind
Streamkeepers North Society: equipment loans and Streamkeepers workshop	\$500 in kind
Yukon College Instructors – 12 days	\$5000 in kind
TOTAL	\$28000 in kind