

**MCINTYRE CREEK
SALMON INCUBATION PROJECT
2007-2008**



**YUKON RIVER SALMON RESTORATION AND ENHANCEMENT FUND
Project # CRE65-07**

March 2008 Project Report

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Abstract

The McIntyre project tagged and released 73,449 Yukon River chinook salmon in early summer, 2007 (from 2006 broodstock): 38,991 fry were released into Takhini River and 34,458 fry into Tatchun Creek. Approximately 69,000 eggs were planted in the McIntyre Creek Salmon Incubation Facility (MCSIF) hatch trays in August 2007, including 17,785 eggs from Takhini River and 47,720 eggs from Tatchun Creek. Fertilization estimates ranged from 80 to 90% in Takhini River eggs and from 50 to 100% in Tatchun eggs. Egg picks indicate that approximately 54% of Tatchun eggs and 84% of Takhini eggs survived to ponding. Thermal marking trials were carried out and fry otolith marks will be assessed in the DFO otolith lab in 2008. Opportunities to integrate stewardship with education were provided to Yukon College and other Yukon students who observed, worked and volunteered in most of the project activities. An estimated 300 students, teachers and volunteers participated in the Stream to Sea program classroom incubation, salmon releases and tours in early summer 2007. In the 2007- 2008 academic year the MCSIF salmon eggs provided salmon eggs to 13 classes, involving an additional 330 students, teachers and volunteers with egg collection and incubation. The site was also used to incubate eggs for temperature effects studies carried out by Nick de Graff for Kwanlin Dun First Nation.



McIntyre Capilano Troughs

Executive Summary

The Northern Research Institute (NRI) operated the MCSIF for the 2007/2008 broodstock season with funding from the Yukon River Panel. NRI provided administrative support while working in partnership with Yukon College, Fisheries and Oceans Canada (DFO), Yukon Youth Conservation Corps (Y2C2), Streamkeepers North Society, as well as Whitehorse and various community schools, to carry out the educational and salmon culture objectives of the project.

School and public participation in the project was encouraged throughout the 2007-2008 broodstock season. Six Yukon College students carried out monitoring and maintenance-five first-year Renewable Resource Management students and a second year student. High School students worked and volunteered during the tagging and the Y2C2 participants conducted fry trapping. In early summer 2007, several Whitehorse classes visited the MCSIF as part of their fry release field trips, and other Yukon classes released salmon fry that had been incubated from MCSIF eggs back into their natal streams. MCSIF egg incubation and field trips involved an estimated 300 students, teachers and volunteers participants in early summer 2007. In the fall of 2007, the MCSIF once again supported DFO's Stream to Sea program by providing 13 public schools with salmon eggs. This program helps Yukon students gain experience and understanding of salmon life cycles and habitat requirements and develop a stewardship ethic. An additional 330 students, teachers and volunteers participated in MCSIF egg collection and incubation in the 2007-2008 academic year.

All of the chinook fry reared at the MCSIF from the 2006-2007 broodstock were coded wire tagged and released between June 25, 2007 and July 26, 2007. A total of 73,449 chinook fry were tagged and released- 34,458 back into Tatchun Creek and 38,991 back into the Takhini River system.

Approximately 69,000 chinook eggs were collected for incubation at the MCSIF in 2007. An estimated 47,720 Tatchun eggs were taken to be incubated in MCSIF heath trays. An estimated 17,785 Takhini chinook eggs were taken to be incubated in MCSIF heath trays. All collections were completed between August 18 and August 31, 2007. Eggs and milt were collected on site and transported with ice packs back to the MCSIF. At the MCSIF, each batch of eggs was mixed with the milt of two chinook, and then planted into the heath stack incubation trays.

In late August, Whitehorse Rapids Hatchery staff planted eggs from Whitehorse Rapids fishway chinook into a couple of egg trays at the MCSIF. This was in support of the Kwanlin Dun First Nation's investigation of the effects of temperature during incubation on chinook sex differentiation. The investigation will contribute to the future management of artificial propagation of Yukon River chinook salmon.

Estimates of fertilization for Takhini River eggs, based on samples of 10 eggs, was 80, 90 and 100 percent. Tatchun Creek egg fertilization estimates varied considerably among batches from 50 to 100 percent. Survival of Takhini eggs is estimated at 84%. Survival of Tatchun eggs is estimated at 54%. Re-enumeration of chinook fry will be done in April/early May as dead eggs in clumps are difficult to enumerate accurately. Fry ponding started March 15th and will be completed by the end of March.

The results of a thermal marking trial on the 2006-2007 broodstock were not assessed in 2007. Initial examination of a couple of preserved fry in early 2008 did not show a clear thermal mark. More 2006 brood fry have been preserved and will be assessed by the DFO Whitehorse otolith lab in 2008.

In spite of problems with heaters, Tatchun chinook have been exposed to five post-hatch warm cycles to create an otolith thermal mark. Takhini chinook will be exposed to three warm cycles. Fry will be preserved and examined in 2008 to determine the success and pattern of the marking.

Fry trapping carried out by Y2C2 and DFO at Tatchun Creek in July 2007 showed that MCSIF fry in Tatchun averaged 2.6 mm larger than wild fry trapped at the same time, immediately after completion of releases. DFO and Y2C2 also trapped fry at Flat Creek in the Takhini Valley at the end of June. Takhini fry at MCSIF averaged 6 mm longer than 0+ wild fry trapped at Flat Creek at the time.

Adult salmon returns were monitored during broodstock collection at Tatchun Creek and Takhini River. One adipose-clipped male chinook was captured among the total of 26 chinook captured during broodstock collection at the Takhini River. However, no tag was detected. No adipose-clipped adult chinook were observed during broodstock collection at Tatchun.



Chinook Egg Takes

Project Report

Introduction

The McIntyre Creek Salmon Project was administered by the Northern Research Institute in 2007-2008 with funding from the Yukon River Panel. The Institute has worked with Yukon College Renewable Resources students, partner organizations and contractors to operate the site since the spring of 2002. Students in the Renewable Resource Management program have been involved in all aspects of the project.

The MCSIF continued to incubate salmon eggs from Tatchun Creek and Takhini River and raise them to release, while providing learning opportunities and work experience for Yukon students. Yukon College students participated in broodstock collection, egg takes, site monitoring, egg picking, testing and adjusting of a new thermal marking system, fry ponding and rearing, coded wire tagging, and fry releases. In 2007-2008, the incubation facilities were also used in two studies on the effect of temperature on chinook salmon development. The MCSIF again provided eggs and tour opportunities to Yukon schools involved in classroom salmon incubation projects.

Ponding and Rearing of the 2006/2007 fry

Yukon College students moved all of chinook fry into Capilano troughs by March 29th 2007. Student employees looked after the daily feeding and cleaning until the last of the fry were released in late July.

Initially fry were placed into two troughs: one for Takhini marked fry and the other for Tatchun fry. Takhini fry were then volume counted and placed into the third trough. After the fourth trough had settled from frost upheaval, some Tatchun fry were moved into it.

Flow in each of the troughs was initially set at 60 LPM and was increased over the rearing period to about 100 LPM. A maximum total of 400 LPM of water flow was used by the incubation site in mid May through to the time of release.

Fry were fed Skretting Nutra Plus feed. Food was distributed using 24 hour Ziegler belt feeders. In early April the total amount of food fed daily was less than 300 grams per day. By mid May the feeding had been increased to 1,200 g/day. In June this went up to 1,300 grams/day. This amount was continued until the first batches of fry were tagged and released. Food distributed decreased periodically as fry were released until the last of the chinook fry were tagged and released on July 26, 2006.

Almost 1,152 Tatchun fry died during the rearing period. There were approximately 610 Takhini River fry mortalities during rearing.

Tanks 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 incubation site outflow channel to McIntyre Creek was cleaned daily to prevent breaching of the screen and backwatering of the channel.

(See Appendix A: McIntyre Project Chinook Fry Sampling 2007)



Ponding of Salmon

School and Community Involvement

Community education is a focus of the McIntyre Salmon Incubation Project. Yukon College students in the Renewable Resources Management program learned about salmon incubation and were again employed to carry out most of the activities related to the project. An estimated 300 students, teachers and volunteers used the MCSIF eggs for Stream to Sea program classroom incubation projects and salmon releases field trips or MCSIF tours in early summer 2007. These included a Yukon College Developmental Studies Biology class, a class visiting from Beaver Creek as part of a more extensive fisheries studies field trip, several local elementary schools and a local high school class. High School students from Porter Creek High were involved with the coded wire tagging process, some as volunteers and others as employees. Participants in the Y2C2 program provided assistance with fry trapping and fry releases. Several interested residents were welcomed when they stopped by the site to see what was going on, particularly during tagging.

In the 2007- 2008 academic year the MCSIF salmon eggs provided salmon eggs to 13 classes, involving an estimated 330 students, teachers and volunteers with egg collection and incubation. These participants using the MCSIF included an estimated 70 high school and post secondary students and a biologist carrying out a study for the Kwanlin Dun First Nation.

Tagging

Phyllis Nelson was hired again to coded wire tag the MCSIF fry in 2007. Phyllis tagged between June 25th and July 3rd. Her assistant completed the tagging on July 5th. Students from Yukon College and Porter Creek High School were hired to assist with the tagging and adipose clipping procedure.

4,574 total chinook fry that were too small for the coded wire tag were marked only by an adipose clip.

In early 2008, NRI purchased coded wire tags in preparation for the upcoming tagging season.

(See Appendix B: McIntyre Coded Wire Tagging Summary 2007)

Releasing

The releases of fry grown from the 2006 broodstock year were carried out between July 17th and July 26th, 2007. The releases were carried out by the DFO Education Coordinator, Y2C2 volunteers and the Yukon College student manager.

(See Appendix C: Maps of Release Sites and Rearing Sites 2007)

Takhini River fry were released between July 17th 2007 and July 21st, 2007. Fry were not sampled at the time of release, but assuming growth rates similar to those of 2006, the average size at release was estimated to be 1.6 grams and 52 mm. No fry trapping was conducted at Takhini River but fry rearing at MCSIF on June 24th were slightly larger (by 2 to 6 mm) than wild fry trapped at Flat Creek (Takhini tributary) on June 28th.

(See Appendix D: Flat Creek Fry Trapping Data 2007)

Fry were released at Tatchun Creek in three groups between July 23rd, 2007 and July 26th. Fry trapping was conducted at the time of release and indicated that hatchery fish were an average of 2.6 mm longer than wild fry.

(See Appendix E: Tatchun Creek Fry Trapping Data 2007)

Fry Trapping

Y2C2 and DFO personnel trapped fry in Tatchun Creek after completion of the releases. Hatchery fry sampled on July 27th averaged 60.2 mm in length. This was slightly larger than the size of wild fry trapped at the same time which averaged 57.6mm. Fry had grown approximately 7 mm from their pre-tagging length one month earlier.

Y2C2 and DFO also conducted fry trapping at the end of June at Flat Creek in the Takhini River valley. They captured only wild chinook fry. Wild young of the year chinook fry averaged 47.4 mm on June 28th. This was slightly smaller than Takhini fry rearing at MCSIF, which a few days earlier averaged from 49 to 53 mm.

Broodstock collection

In 2007, Chinook broodstock were caught by drift netting at the Takhini River between August 18th and August 31st. Chain link pens (4' x 4' x 8') were placed in an eddy to hold the salmon until ripe. Females were placed in 8" diameter PVC tubes inside the pens. Water temperature at the Takhini egg take site ranged from 15°C at the beginning of egg takes on August 19th, to 13.5°C at the end of egg takes.

19,000 eggs were taken from 4 Takhini River Chinook. Eggs were transported to MCSIF in zip lock bags in coolers, with ice packs. Milt was collected in whirl pacs after each egg take and also transported in a cooler with ice packs. Of these, an estimated 17,785 were taken for planting in the MCSIF heath trays. Others were incubated in small samples in the Takhini River and at MCSIF as part of a temperature and incubation survival study.

(See Appendix F: Takhini River Chinook Egg Take 2007)

Tatchun Creek broodstock were collected between August 17th and August 27th. Most fish were captured through angling, although a few were captured by dip net. Fish were held after capture in PVC tubes, 8" in diameter and about 120 cm long, with clothesline barriers at each end. Water velocity through the tubes was minimised by using large rocks when eddies were not sufficient. Most fish were held only until egg take at the end of the day of capture. A few tubes were stowed under a debris pile so that fish could be held for ripening for a few days. Bears located and removed lids from all the tubes between August 25th and August 27th. Three chinook (two females) held in the debris pile were lost. Approximately 50,000 eggs were taken from 12 females. Of these, an estimated 47,720 from 11 females were taken for planting in the MCSIF heath trays. Others were incubated in Tatchun Creek and at MCSIF as part of a temperature and incubation survival study. Water temperature taken during the egg take period ranged from 18.5°C on August 18th to 16°C on August 27th.

(See Appendix G: Tatchun Creek Chinook Egg Take 2007)

Adult Return Monitoring

The broodstock collection crew at the Takhini River captured and examined 24 chinook salmon, 17 males and 7 females. Of these, one male was adipose clipped. Unfortunately no tag was detected in the head. High water throughout the spawning period made it difficult to spot carcasses. Only two were observed when the spawning area was surveyed on September 8th.

The broodstock collection crew at Tatchun Creek monitored their catch and spawners in the vicinity for the presence of adipose-clipped fish. An estimated 40 fish were captured and examined and another 40 examined visually instream during broodstock collection. No adipose-clipped chinook were observed at Tatchun Creek. Bears had left only a couple of tails to examine in early September.

Coded wire tag return posters were distributed to Dawson fishers and to sport fishing sites prior to the fishing season in 2007. However, low run numbers resulted in commercial and sport fishery closures.

Incubation

Each batch of Takhini River eggs was fertilised with milt from at least two males and planted into heath trays at MCSIF. Flow was set at about 9 LPM. Ten eggs from each batch from the four females were held in separate isolation baskets and checked after 24-48 hours to determine percent fertilisation. Fertilisation rate estimates were 80 %, 90%, and 100% on the first three batches; the last batch was checked too early to determine fertilization.

Tatchun eggs were fertilised with milt from at least two males and planted into egg trays in the heath stack enclosure. Fertilization estimates on sub-samples of 9 or 10 eggs put aside for fertilization checks ranged from 50% to 100%.

Flow was lost to the G stack of eggs for some time between the evening of August 26th and the morning of August 27th. The duration of flow loss is uncertain as no emergency call was received due to problems with the alarm system.

Whitehorse fishway chinook eggs were planted in heath trays on August 29th and August 31st. Fertilization rates were assessed by Whitehorse Rapids personnel. Surviving fry was ponded at MCSIF at the end of March, 2008.

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 flow, to clean intakes and downstream screens, and to remove dead eggs once eggs had reached the eyed stage.

Water samples were collected from the groundwater channel at the site intake, and downstream of the Capilano troughs and fish screen, and from McIntyre Creek immediately upstream and immediately downstream of the inflow of the groundwater channel. Phosphorus levels in the groundwater channel were below the 0.05 mg/L detectable limit at all sites.

(See Appendix H: Water Board Report)

Egg Picking

Yukon College student employees removed dead eggs from the trays between October 15th, and November 23rd, 2007 at the first signs of hatching. Eggs were shocked with an abrupt change of water and with movement. After shocking, trays were monitored for mortalities and fungus problems. Students removed dead eggs, distinguished by their opaque colour, with egg tweezers and gentle fingers when necessary.

Based on dead egg removal, about 25,000 eggs were estimated to have survived to hatch in the Tatchun Creek eggs. This is a survival rate of about 54% from green eggs. Approximately 14,900 eggs were estimated to have survived to hatch in the Takhini River eggs, a survival of 84% from green eggs. The accuracy of the dead egg counts is always uncertain. Fry counts will be done in early April and again during tagging in the summer of 2008. These will yield more accurate survival data and release numbers.

(See Appendix I: Takhini Chinook Eggs Survival 2007/2008 and Appendix J: Tatchun Chinook Eggs Survival 2007/2008)

Skretting salmon feed (two bags of crumb #0 and two bags of crumb #1) has been purchased and is on site for the 2008 rearing season.

Otolith Thermal Marking Trials

Results of Thermal Marking 2006-2007:

In 2006, each incubation shelter was equipped with a 1000 Watt Livestock Water Immersion Heater and a thermostat to provide for more efficient thermal marking. Thermostats and heaters allowed heating of water within the reservoir at the base of each heath tray. Sump pumps connected to re-circulate warmed water through the heath stacks, to allow all incubation trays containing eggs from one area to be thermally marked at one time.

Tatchun fry released in 2007 had been exposed to four 24 hour warm water cycles prior and up to hatching. Takhini fry were exposed to five warm cycles after hatching, near emergence. Although thermostats were set for 9°C for the warm cycle, the temperature records for the cycles are not complete, and temperature may have fluctuated due to cold water leakage.

A few fry otoliths were examined by students in the DFO otolith lab in February, 2008. Banding was not clear. Several more fry were preserved and will be examined when the otolith lab is operating in 2008.

2007/2008 Thermal Marking:

Thermal marking of the Tatchun alevins was started in January, 2008. Drains were reconfigured to reduce infiltration of cold water to the reservoir during thermal marking. Alevins were exposed to three cycles of warm water in January. More cycles were planned, but cold weather and heater failure interrupted the procedure. Manually controlled heaters were added and Tatchun alevins were exposed to an additional 2 cycles of warm water in March.

The plan is to expose the Takhini alevins to 3 warm cycles prior to ponding. Fry from each batch will be preserved for examination of otolith mark in the DFO lab in summer, 2008.

Site Preparation and Upgrades

The student manager and other Yukon College students completed several upgrading and maintenance projects throughout the 2007/2008 season: some in preparation for the incubation season, some in preparation for the ponding and rearing period, and some in preparation for continuing with the trial otolith marking project. These projects included:

- replacing the old main boardwalk
- repainting all walkways
- building a walkway to the first incubation stacks

- replacing the weather-stripping on the incubation boxes to minimize air leaks
- learning to repair the gill nets for broodstock capture
- Repairing all incubation unit doors
- repairing egg trays as needed in preparation for the incubation season,
- Reconnecting water pipes to establish flow to all four Capilano troughs
- Scrubbing and disinfecting Capilano troughs in preparation for rearing

(For a summary of costs related to the project see Appendix K: Financial Summary March, 2008)

Security System

Spectrum Security continues to monitor the alarm system at MCSIF. The project manager or a delegated employee carried a pager with text capability, the number of which was at the top of Spectrum's alarm call-out list. A cell phone on site enabled workers to request assistance. The student manager could also be contacted at all times in case of emergency (with or without pager) through a personal cell phone. The alarm system requires some repairs to existing float and door switches, and needs to be expanded to include a fourth trough.

Upcoming Season

Yukon College students have prepared the site for rearing and are ponding the 2007/2008 Broodstock year fry. Fish food is on site and some fry have begun to feed.

The tagger has been contacted and arrangements will be made to tag the fry in June, 2008. NRI will engage students, volunteers and contractors to prepare the site for the upcoming season. The repairs and maintenance of the MCSIF will include checking and adjusting the thermal marking heating system, repairing alarms and improving sediment removal in the plumbing system.

NRI will continue to employ Yukon College Renewable Resources Students, including a student manager, to monitor and maintain the MCSIF, and to look after the fry during the rearing period. Cooperation among students and partners will be enhanced through regularly scheduled team meetings in the upcoming academic year.

Appendix A: McIntyre Project Chinook Fry Sampling 2007

Date	Trough	Broodstock ID	# Fry	Average Length (mm)	Average Weight (g)	Average Condition
22-Apr	1	Takhini	10	37.05	0.42	0.82
	2	Tatchun	10	41.15	0.56	0.80
28-Apr	1	Takhini	10	38.70	0.45	0.78
	2	Tatchun	10	41.90	0.68	0.92
05-May	1	Takhini	10	40.20	0.57	0.88
	2	Tatchun	10	43.50	0.70	0.85
	3	Takhini	10	40.60	0.52	0.78
12-May	1	Takhini	10	41.50	0.63	0.88
	2	Tatchun	10	44.50	0.79	0.90
	3	Takhini	10	40.90	0.63	0.92
19-May	1	Takhini	10	43.80	0.76	0.90
	2	Tatchun	10	46.50	0.91	0.91
	3	Takhini	10	44.50	0.77	0.87
02-Jun	1	Takhini	10	44.80	0.83	0.92
	2	Tatchun	10	50.20	1.20	0.95
	3	Takhini	10	47.20	0.92	0.87
13-Jun	1	Takhini	10	50.50	1.16	0.91
	2	Tatchun	10	52.70	1.39	1.01
	3	Takhini	10	49.60	1.13	0.97
24-Jun	1	Takhini	10	53.50	1.43	1.00
	2	Tatchun	10	55.40	1.64	0.90
	3	Takhini	10	49.10	1.05	0.93
17-Jul	1	Takhini	Release*		1.60	
	3	Takhini	Release*		1.60	
20-Jul	1	Takhini	Release*		1.60	
	3	Takhini	Release*		1.60	
23-Jul	2	Tatchun	Release**	60.8		
26-Jul	2	Tatchun	Release**	60.8		

* Release size estimated from previous year growth rate as no sampling was conducted at release.

** Release size based on trapping of hatchery fry at the time of release.

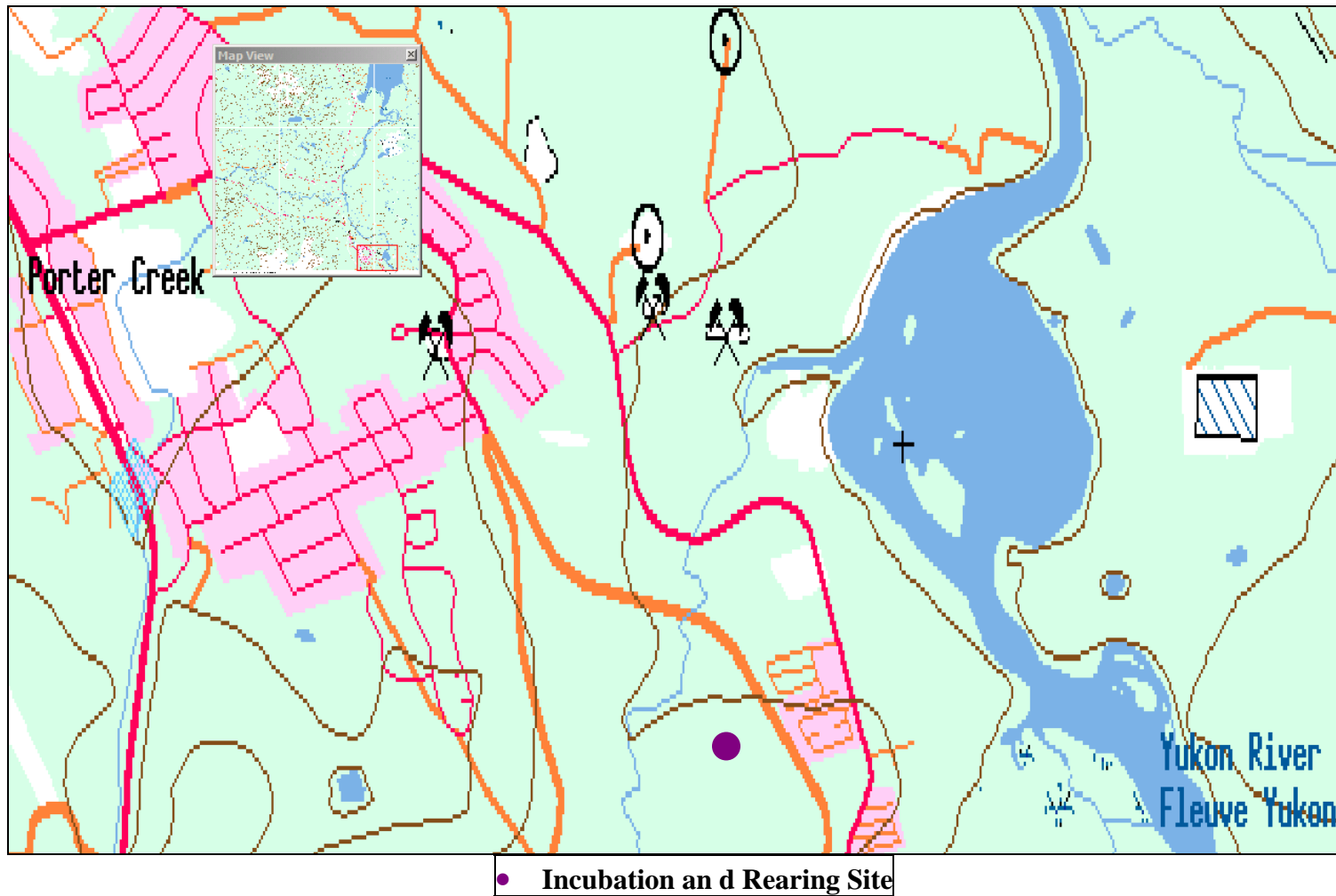
Appendix B: McIntyre Coded Wire Tagging Summary 2007

Tatchun – Tagging 2007 (Broodstock 2006)

code all codes																
DATE	TAG CODE	STOCK	MORTS	DAILY	REJ	ACCUM	SMALL	DAILY	# SAMPLED	TOTAL	TAGGED	ADIPOSE	UNTAGGED			
				TOTAL		TOTAL		RETENTION	FOR RETENTION	RELEASE	marked	RELEASE	CLIP ONLY	RELEASE		
Jun															RELEASE	
30-Jun	02-01-02-04-02	TATCHUN	0	7222		7222	7222	147	99	100	7369	7222	7150	72	147	
1-Jul		otolith marked	0	2735		9957	9957	38	96	100	2773	2735	2626	109	38	
											10142	9957	9775	182	185	
1-Jul	02-01-02-04-03	TATCHUN	0	888		888	10845	19	96	assumed same as above	907	888	852	36	19	
2-Jul			0	8518		9406	19363	94	96	assumed same as above	8612	8518	8177	341	94	
3-Jul			194	714		10120	20077		86	100	520	520	420	100	0	
											10039	9926	9450	476	113	
3-Jul	02-01-02-03-05	TATCHUN	0	5583		5583	25660	189	86	100	5772	5583	4801	782	189	
4-Jul			0	4344		9927	30004	7	96	100	4351	4344	4170	174	7	
											10123	9927	8972	955	196	
4-Jul	02-01-02-03-06	TATCHUN	0	1963		1963	31967	18	96	100	1981	1963	1884	79	18	
5-Jul				4559		6522	36526	83	96	100	4642	4559	4377	182	83	
											6623	6522	6261	261	101	
											TOTAL TATCHUN	36927	36332	34458	1874	595

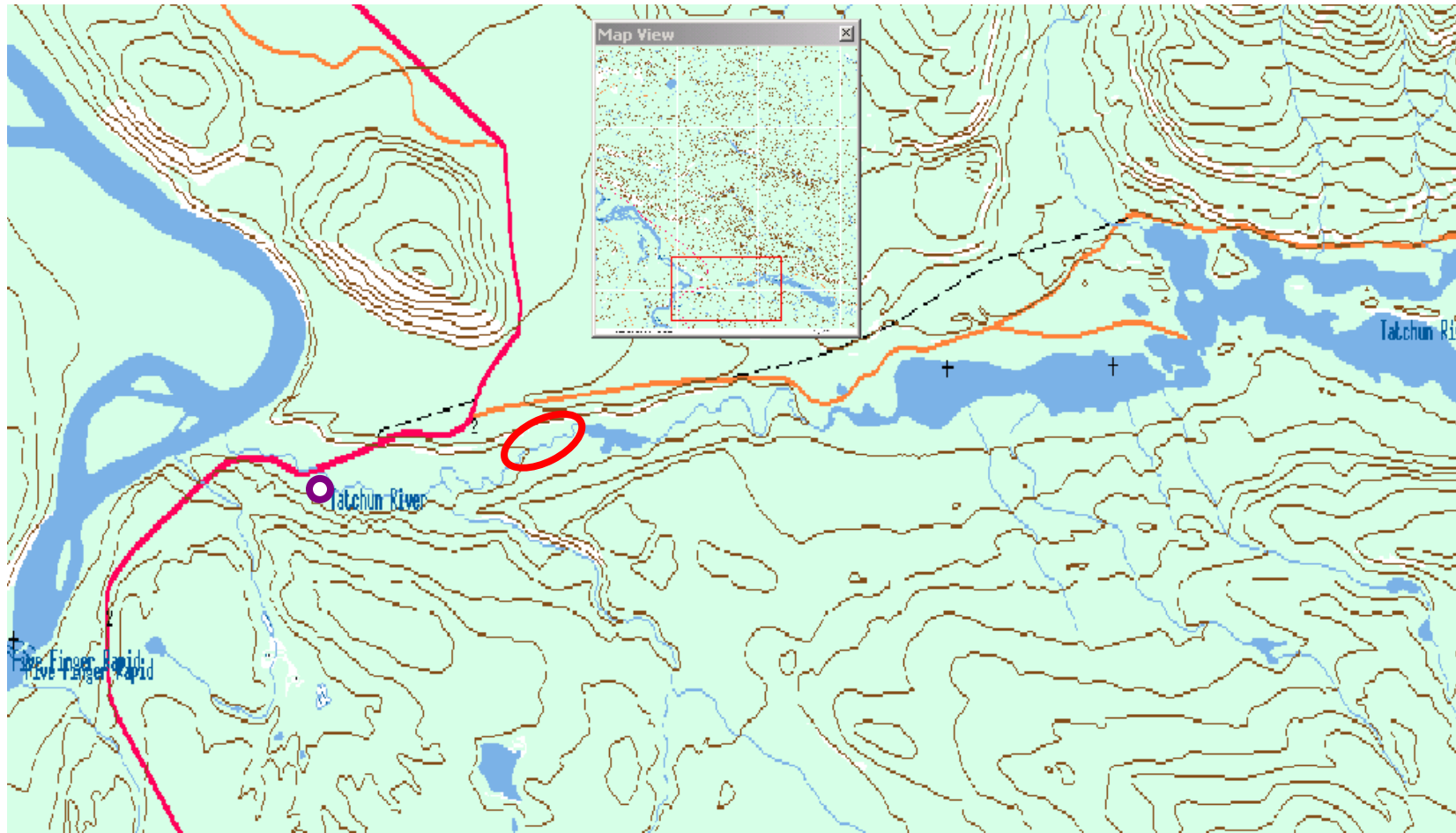
Appendix C: Maps of Release Sites and Rearing Sites 2007

Map 1 - McIntyre Creek Salmon Incubation Facility (NTS Map 105 D14 - SE Corner)



Appendix C: Maps of Release Sites and Rearing Sites 2007

Map 2 - Tatchun Creek Fry Release and Broodstock Collection Sites (NTS Map 115 I8)

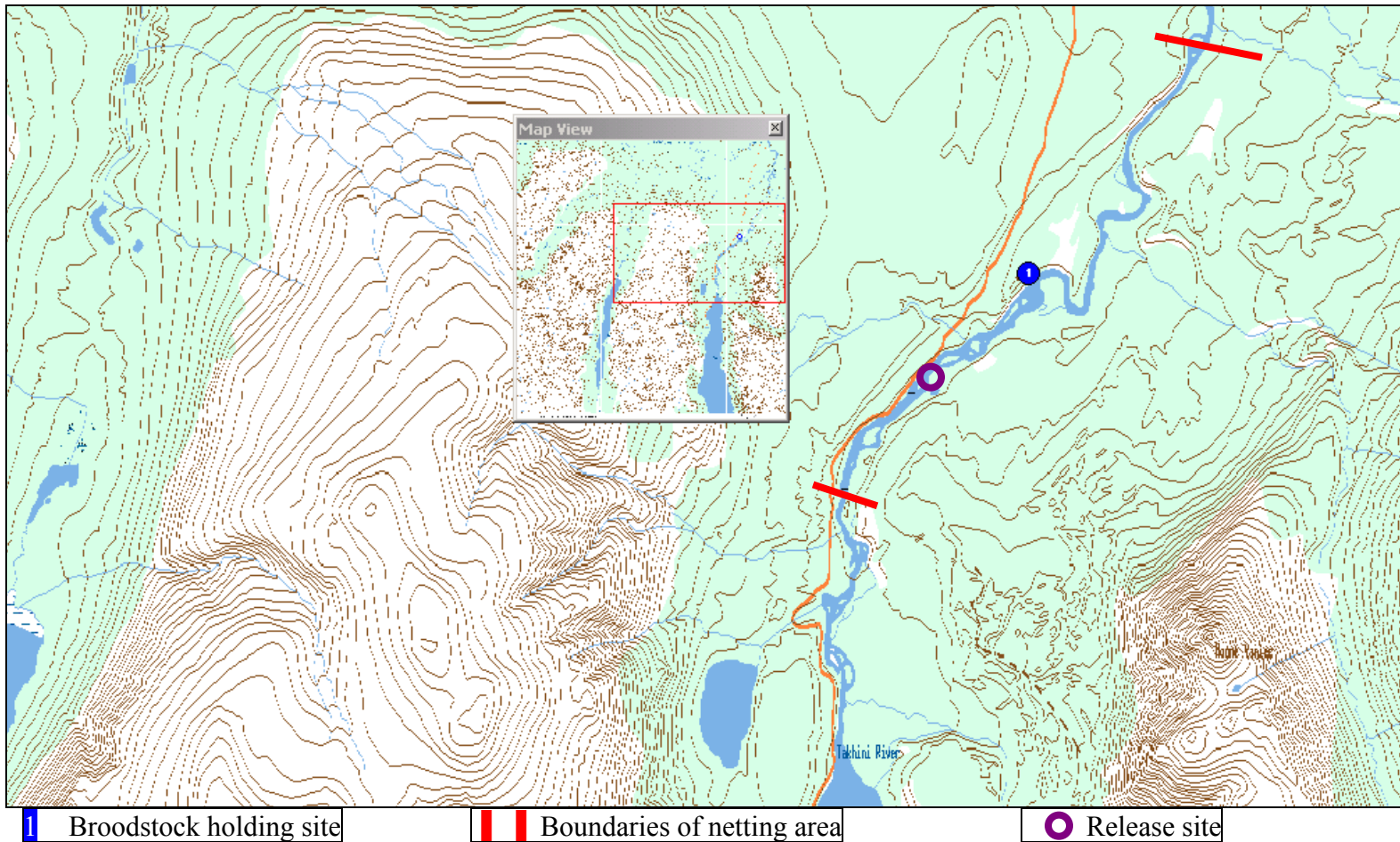


○ Fry Release Site

○ Broodstock Collection Area

Appendix C: Maps of Release Sites and Rearing Sites 2007

Map 3 - Takhini River Netting Area (NTS Map 115A9)



Appendix D: Flat Creek Fry Trapping Data 2007

Date: June 28, 2007
 Location: Flat Creek (Takhini River tributary),
 Samplers: JMG with Y2C2 assistance (Amanda Wren, River Walton)

Lower section was trapped with 6 traps: 2 traps upstream of beaver dam and 4 traps downstream of beaver dam.

Only a single trap downstream of beaver dam (<500m from Takhini River) on left bank (in trees!!) captured fish:

Species	Fork Length (mm)	Age	
Chinook	43	0+	Not in Average
Chinook	96	1+	
Chinook	56	0+	
Chinook	45	0+	
Chinook	49	0+	
Chinook	45	0+	
Chinook	46	0+	
Chinook	47	0+	
Chinook	50	0+	
Chinook	46	0+	
SS	47		Not in Average

Notes:

- No adipose-clipped fish were trapped.
- Average length of 0+ fry = 47.4 mm.

Appendix E: Tatchun Creek Fry Trapping Data 2007

Tatchun Creek Hatchery Chinook Fry: Trapping Summary

	mean length (mm)	n=		overall average
Trap 1	60.54	61	3692.94	
Trap 2	50.46	13	655.98	
Trap 3	60.79	91	5531.89	
Trap 4	60.84	64	3893.76	
Total		229	13774.57	60.1509607

Tatchun Creek Wild Chinook Fry: Trapping Summary

	mean length (mm)	n=		overall average
Trap 1	58.91	23	1354.93	
Trap 2	50.44	16	807.04	
Trap 3	60.64	39	2364.96	
Trap 4	56.26	27	1519.02	
Total		105	6045.95	57.58047619

Difference Between Hatchery and Wild Fry
Average Length (mm): **2.570484508**

Appendix F: Takhini River Chinook Egg Take 2007

August 13th

Trix Tanner (DFO) and Ken Knutson (NRI).

Water temp 14.2°C at 17:30

No adult salmon observed. High water. Fry swimming through blueberry bushes.

August 18th

Ken and Doug Knutson (NRI).

Observed 3 salmon.

Captured and held 1 female chinook.

August 19th

Trix and Ken

Water 15 °C

Observed 5 salmon - in fast water, not on redds.

Finally caught 1 male, but it produced only minute quantities of milt (<1/4 tsp.)

Released male and female.

August 24th

Trix and Ken

Water temperature 14.8°C at 16:00

Observed 14 chinook in river: 3 females and 11 males.

Previously captured female and 2 males observed on redd upstream of Austads.

Caught 7 males. Held 4 males for broodstock; took milt from 3 and marked and released.

Caught 1 ripe female near campground. Took eggs.

August 26th

Ken and Doug.

Caught 1 mainly spent female.

Caught 1 female, not ripe.

August 28th

Trix and Ken.

Water 14°C at 16:30

Capture 1 ripe female; take eggs.

Take eggs from Aug 26 female.

Capture 3 males- 1 CWT. Took milt from these and 1 male holding

August 31st

Trix and Doug

Water temperature 13.5 °C at 2 pm

Capture 1 spent female and 1 part spawn female- took eggs.

Capture 8 males (including 2 recaptures)

Took milt from 4 males.

September 8th

Trix and Ken.

Water temperature 12° Cat 5 pm

8 salmon observed: 2 carcasses, 6 appeared near death.

Appendix F: Takhini River Chinook Egg Take 2007 – Broodstock Female Sample Data

Date	Fish ID #	Length	Length	Scales	Scales	Weight	Weight	Egg	Egg	# Eggs	Calculated	Males used	Comments
		POHL (mm)	FL (mm)	Card #	#'s (5 down)	pre egg take (kg)	post egg take (kg)	diameter (mm)	vol (ml)		# eggs		
24-Aug-07	TK-F2	735	945	47326	1-41	7.2	5.9	6.1	1725	114	6555	M3 & M4	scoliosis
28-Aug-07	TK-F4	705	860	75200	1-41	5	4.4	6.2	800	129	3440	M28-1 & M28-2	
28-Aug-07	TK-F5	790	965	75200	2-42	8.3	6	6.9	1725	95	5463	M28-2 & M28-3	
31-Aug-07	TK-F6	725	910	75200	9-49	N/A	5	6.4	900	128	3840	M31-1 & M31-4	tail worn partly spawned
TOTAL:											19298		

Appendix F: Takhini River Chinook Egg Take 2007 – Broodstock Male Sample Data

Date	Fish ID #	Length POHL (mm)	Length FL (mm)	Girth (mm)	Scales Card #	Scales #'s (5 down)	Weight (kg.)	Comments
24-Aug-07	M3	660	835	370	47326	2-42	4.8	Adipose clipped (CWT)?
	M4	760	1030	500	47326	3-43	9.5	
28-Aug-07	M28-1	675	825	350	75200	3-43	4.2	
	M28-2	600	755	340	75200	4-44	3.6	
	M 28-3	740	940	470	75200	5-45	7.8	
31-Aug-07	M31-1	775	980	420	75200	6-46	7.4	
	M31-4	680	885	370	75200	10-50	5.2	

Appendix G: Tatchun Creek Chinook Egg Take 2007

August 8

Trix Tanner (DFO) and William Linklater (NRI, Yukon College student) walk creek from holding pool to campground.

No adult chinook seen.

Trimmed and moved debris piles to allow access for fish. Located complete blockage from windfall cottonwoods (40 cm diameter) sealed together by beaver activity between campground and slide.

Water temperature 17°C to 17.8°C.

August 9

Trix contacts Little Salmon Carmacks and YTG to get approval to remove windfall blockage.

August 10

Trix and Jacques Jobin remove enough of windfall to restore fish passage.

August 18

Trix and Shirley Hill (Yukon College student volunteer) count 47 salmon: 40 in pool, 7 between slide and pool.

Most fish examined not ripe. Took eggs from 1 ripe chinook and milt from 2 males.

Found one unspawned ripe female mortality in channel.

Water temp. 18.5°C. 1 female ripe - planted

August 20

Trix, William and Shirley.

Caught 4 females at Tatchun: held 3 not yet ripe in tubes, and took eggs from 1.

Estimated 70 adult chinook in the pool, a couple below the pool digging, none close upstream, and none downstream in 200m stretch downstream of slide.

Water temperature. 17.5°C at noon

August 22

Trix and Sean Collins (DFO) and Ken Knutson (NRI) and 3 young Whitehorse students.

Took eggs from 1 full female. Fertilized with milt from 2 males.

Water temperature 17.5°C at 2 pm.

Kept 2 females in tubes under log jam to ripen.

August 25

Trix and Doug Knutson (NRI).

Took eggs from 5 chinook, took milt from 7 chinook. Held 2 females to ripen.

Counted 20 adult chinook and 6 redds between slide and pool- spawning.

Observed 2 redds in riffle immediately upstream of pool. Estimated 60 chinook in pool.

Water temperature 16°C at noon

August 27

Trix and Sean.

Bear tracks (sow and 2 cubs) up the creek.

Caps removed and webbing torn on all tubes; 2 female chinook gone from tubes.

Captured and took eggs from 2 full females and 1 half-spawned female, and milt from 4 males.

Water temperature 16°C at 1 pm.

Appendix G: Tatchun Creek Chinook Egg Take 2007 – Broodstock Female Sample Data

Date	Fish ID #	Length POHL (mm)	Length FL (mm)	Scales Card #	Scales #'s (5 down)	Weight pre egg take (kg)	Weight post egg take (kg)	Egg diameter (mm)	Egg vol (ml)	# Eggs in 30 ml	Calculated # eggs	Males used	Comments
18-Aug-07	Tt1	680	885	37731	1-41	6.1	4.6	5.9	1400	140	6533	M1 and M5	
20-Aug-07	Tt2	720	895	33732	1-41	7	5.2	6.9	1450	99	4785	M8 and M11	
22-Aug-07	Tt4	770	940	45822	3-43	7.8	6.2	6.6	1500	110	5500	M13 & M15	
25-Aug-07	Tt5	700	875	37732	5-45	N/A	N/A	5.3	750	154	3850	M16 & M17	Gelatinous layer on abdominal wall White spots on heart
25-Aug-07	Tt6	705	860	37732	6-46	N/A	N/A	5.7	720	141	3384	M18 & M19	Abdominal Injury 75 % ripe
25-Aug-07	Tt7	745	910	37732	7-47	N/A	N/A	6.3	1050	120	4200	M19 & M20	Some water hardening
25-Aug-07	Tt8	760	920	37732	8-48	N/A	N/A	6.8	1150	114	4370	M20 & M21	
25-Aug-07	Tt9	705	875	45822	10-50	N/A	N/A	6.1	1200	136	5440	M21 & M22	
27-Aug-07	Tt10	720	890	45824	1-41	N/A	4.1	6	600	162	3240	M27-3 & M27-5	
27-Aug-07	Tt11	720	900	45824	3-43	7.1	5.2	6.4	1650	133	7315	M27-3 & M27-4	
27-Aug-07	Tt12	775	940		2-42	N/A	6.4 (not bled)	6.6	400	113	1507	M27-4 & M27-10	
TOTAL:											50124		


Appendix G: Tatchun Creek Chinook Egg Take 2007 – Broodstock Male Sample Data

Date	Fish ID #	Length POHL (mm)	Length FL (mm)	Girth (mm)	Scales Card #	Scales #'s (5 down)	Weight (kg.)	Comments
18-Aug-07	M1	755	965	420	37731	4-44	6.7	
18-Aug-07	M5	660	845	390	37731	N/A	5.2	
20-Aug-07	M8	700	890	404	37732	3-43	6.2	
20-Aug-07	M11	600	785	345	37732	4-44	3.6	
22-Aug-07	M13	740	985	434	45822	5-45	7.3	
22-Aug-07	M15	840	1040	490			9.3	
25-Aug-07	M16	655	845	380	37732	9-49	N/A	
25-Aug-07	M18	575	755	335	37732	10-50	N/A	
25-Aug-07	M21	640	843	365	45822	8-28	N/A	
25-Aug-07	M17	645	835	345	45822	9-29	N/A	
25-Aug-07	M20	735	940	435		N/A	N/A	
25-Aug-07	M19	660	860	365		N/A	N/A	
25-Aug-07	M22	660	845	375		N/A	N/A	
27-Aug-07	M27-5	660	840	400	45824	4-44	5.4	
27-Aug-07	M27-3	670	850	380	45824	5-55	5.1	
27-Aug-07	M27-4	650	890	370	45824	6-46	5.1	
27-Aug-07	M27-10	710	900	380	45824	7-47	5.9	

Appendix H: Water Board Report 2007

03/25/2008 10:16:48 FAX 804 514 3323 Norwest Lake 607699

Page 1 of 3



Analytical Report

Lot ID: **607699**

Bill To: Northern Research Institute
 Report To: Northern Research Institute
 Box 2793
 Whitehorse, YT, Canada
 Y1A 5K4
 Attn: Clint Sawold
 Sampled By:
 Company:

Project:
 ID:
 Name:
 Location:
 LSD:
 P.O.:
 Acct code:

Control Number:
 Date Received: Mar 17, 2008
 Date Reported: Mar 25, 2008
 Report Number: 1100585

Analyte	Reference Number	Sample Date	Sample Location	Sample Description	Matrix			Nominal Detection Limit
					1	2	3	
	607699-1				Water	Water	Water	
					Units	Results	Results	Results
Metals Total								
Phosphorus					mg/L	<0.05	<0.05	<0.05
								0.05

Bodycote Testing Group www.bodycote.com www.bodycote-testing.com
 #104, 12275-55th Ave - Skelly - 80° 12' 25" N - Canada - Tel: +1 (864) 514-3323 Fax: +1 (864) 514-3323
 Toronto: +1 (416) 491-1111 www.bodycote-testing.com/toronto@bodycote.com




Analytical Report

Bill To: Northern Research Institute	Project:	Lot ID: 607699
Report To: Northern Research Institute	ID:	Control Number:
Box 2799	Name:	Date Received: Mar 17, 2008
Whitehorse, YT, Canada	Location:	Date Reported: Mar 25, 2008
Y1A 5K4	LSD:	Report Number: 1100565
Attn: Clint Sawicki	P.O.:	
Sampled By:	Acct code:	
Company:		

Reference Number	607699-4
Sample Date	
Sample Location	
Sample Description	4
Matrix	Water

Analyte		Units	Results	Results	Nominal Detection Limit
Metals Total					
Phosphorus	Total	mg/L	<0.05		0.05

Approved by: 
 Walter Brandl
 Operations Manager - Surrey

Appendix I: Takhini Chinook Eggs Survival 2007/2008

Date Eggs Taken	Egg Batch ID	Egg Tray	Date of First Egg Pick	# Eggs Planted in Heath Trays*	Fertilization check	# Eggs Picked (est.)	Calculated # Eggs Remaining	% Survival from Green Eggs
24-Aug-07	TkH2	E1	26-Oct-07	6099	8/10	1640	4459	73.1
28-Aug-07	TkH4	E3	21-Oct-07	3053	9/10	817	2236	73.2
28-Aug-07	TkH5	E4	14-Nov-07	5177	10/10	85	5092	98.4
31-Aug-07	TkH6	E5	14-Nov-07	3456	17 hours not visible	354	3102	89.8
Total:				17785		2896	14889	84%

* Estimates of large numbers are of variable accuracy due to difficulty counting and calculating numbers of dead eggs in clumps.

Notes:

- Does not include eggs removed from batch for study sample.
- Numbers of surviving fry will be assessed at ponding.

Appendix J: Tatchun Chinook Eggs Survival 2007/2008

Date Eggs Taken	Egg Batch ID	Egg Tray at Planting	Date of First Egg Pick	# Eggs Planted in Heath Trays*	Fertilization check	# Eggs Picked (est.)	Calculated # Eggs Remaining	% Survival from Green Eggs
18-Aug-07	TtH1	G1	17-Oct-07	6207	5/10	4500	1707	27.5
20-Aug-07	TtH2	G2	20-Oct-07	4361	7/10	3500	861	19.7
22-Aug-07	TtH4	G4	20-Oct-07	4977		1678	3299	66.3
25-Aug-07	TtH5	H1	28-Oct-07	3429		589	2841	82.8
25-Aug-07	TtH6	H2	26-Oct-07	2986		2800	186	6.2
25-Aug-07	TtH7	H3	26-Oct-07	3872		2835	1037	26.8
25-Aug-07	TtH8	H4	28-Oct-07	4055		556	3499	86.3
25-Aug-07	TtH9	H5	28-Oct-07	4883		425	4458	91.3
27-Aug-07	TtH10	F1	4-Nov-07	2812	10/10	642	2170	77.2
27-Aug-07	TtH11	F2	4-Nov-07	6961	9/10	3499	3462	49.7
27-Aug-07	TtH12	F3	14-Nov-07	1177	10/10	16	1161	98.6
Total:				45720			24681	54.0%

* Estimates of large numbers are of variable accuracy due to difficulty counting and calculating numbers of dead eggs in clumps.

Note:

- Numbers of surviving fry will be assessed at ponding.

Appendix K: Financial Summary March, 2008

MCSIF - Salmon Incubation Project - 2007/08

Total Received from Yukon River Panel - Project CRE65-07 - \$44,300.00

FINANCIAL SUMMARY			
I. PERSONNEL COSTS:			
Tagging, Egg Takes			
Site Monitoring/Feeding/Picking	\$13897.78		
		\$13897.78	
Contract Services			
Tagging	\$3098.79		
Total North Communications	\$187.67		
Jacobs Industries	\$392.98		
		\$3679.44	
II. OPERATING COSTS:			
A. TRAVEL			
Mileage - egg takes, fly trapping and carcass surveys, boat fuel, etc.	\$1955.98		
		\$1955.98	
B. MATERIALS, SUPPLIES, MAINTENANCE			
Construction/Plumbing/Electrical/ Incubation Supplies, Tags, Tagging Equipment	\$13941.94		
Electricity	\$3107.39		
Security (phones, monitoring)	\$1152.90		
Fish Food - EWOS	\$366.88		
Permit Fee	\$26.80		
Printing	\$96.01		

		\$18691.92	
C. COORDINATION:			
Coordination Fee (15%)	\$6074.88		
		\$6074.88	
SUB-TOTAL		\$44300.00	
TOTAL			\$44,300.00

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

Assistance Details

Amount of funding

Northern Research Institute: 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