

**Taku River Watershed
Little Trapper Lake Sockeye Salmon Enumeration
and
Kowatua River and Tatsatua Creek
Chinook Salmon Post-spawn Sampling
2017**

**PSC NF-2017-I-22
Project DFO 57676**

**Final Report
January 2018**

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Executive Summary

The Northern Endowment Fund provided Fisheries and Oceans Canada with monies to continue three unique but linked projects in the upper Taku River watershed in 2017. First, the enumeration and biological sampling of returning Little Trapper Lake sockeye salmon (*Oncorhynchus nerka*), second and third, post-spawn tag recovery and biological sampling of Chinook salmon (*Oncorhynchus tshawytscha*) in the Kowatua River and Tatsatua Creek.

A total of 6,552 sockeye salmon were enumerated as they passed through a weir located at the outlet of Little Trapper Lake between 22 July and 10 September 2017. The target of 800 biological samples was achieved.

A total of 238 post-spawn Chinook salmon were assessed for tags and biologically sampled in Kowatua River via carcass pitch between 23 August and 8 September 2017.

A total of 26 post-spawn Chinook salmon were assessed for tags and biologically sampled from a carcass weir and 209 Chinook salmon were assessed for tags and biologically sampled via angling in Tatsatua Creek between 21 August and 11 September 2017.

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1.0 Introduction

The purpose of this project was to provide an escapement count for Little Trapper Lake sockeye salmon, and to generate Event II (tag recovery) and biological data for the Taku River Chinook salmon mark-recapture project in 2017.

Sockeye salmon enumeration via counting fence has been conducted at Little Trapper Lake at the headwater of Kowatua River in the Taku River drainage for more than 30 years. This provides a long term index of sockeye escapement into the Taku River. The Little Trapper stock is the largest lake stock in the drainage and is an index for drainage wide abundance.

Tag recovery and biological sampling for Chinook salmon on Kowatua River and Tatsatua Creek (both are in the vicinity of Little Trapper Lake) has also occurred for many years and provides significant contributions (~50%) to the Event II tag recovery and biological data used in the estimation of drainage-wide Taku River Chinook abundance. This has involved boat surveys on Kowatua River and a carcass fence and surveys on Tatsatua Creek.

The project provides high quality biological data (age, size) and samples (genetics) which aid in stock assessment of both species.

In recent years, Fisheries and Oceans Canada (DFO) core agency funding has been reduced and consequently these important and long term assessment activities were at risk of being discontinued. Funding was received from the Northern Endowment Fund to continue these projects for 2017.

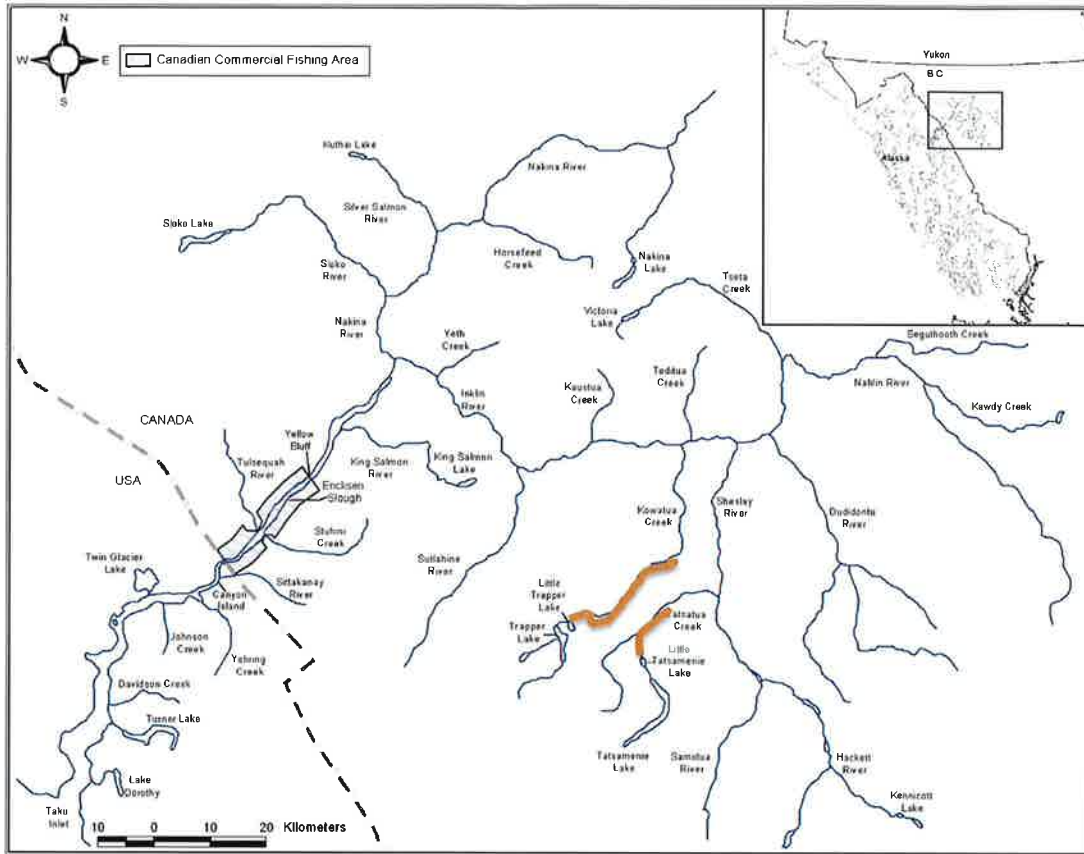


Figure 1. The Taku River drainage in British Columbia and Southeast Alaska. The orange highlighting approximates the project areas.

2.0 Methods

In 2017 DFO engaged Metla Environmental Inc. (MEI) of Whitehorse, Yukon under contract to deliver the project. MEI had successfully delivered the project in 2015 and 2016. MEI utilized existing infrastructure, equipment and methodologies. The contract statement of work included the following elements, matching the objectives of the project:

1. Operation of an enumeration weir on the Kowatua River at the outlet of Little Trapper Lake, during the sockeye run.
2. Enumeration of all salmon and spaghetti tags passing through the enumeration weir. Recovery of as many spaghetti tags as possible without unduly disrupting migration.
3. Sampling 800 live sockeye for length, sex, scales, axillary appendage clips, and tags in proportion to run timing.
4. Sampling all available post-spawn Kowatua River and Tatsatua Creek Chinook for adipose-clips, floy tags, coded-wire tags, secondary marks, length, sex, and scales over the course of the spawning/die off period.

The weir at the outlet of Little Trapper Lake in Kowatua River was installed and made fish tight by 22 July 2017, and was in place through 10 September 2017. The personnel operating the Little Trapper weir also conducted the Kowatua River Chinook carcass recovery and sampling beginning 23 August 2017 and concluding 8 September 2017 based on run timing and carcass availability. A jet boat was utilized to access the river from the weir downstream approximately 8km. A spear was used to collect post-spawn dead or moribund Chinook; a small number of samples were collected from live Chinook transiting the sockeye weir. Field staff were based at facilities owned by MEI.

The Tatsatua Creek Chinook carcass fence which intercepts post-spawn dead or moribund Chinook floating downstream was installed on 21 August 2017 and was operated through 11 September 2017. The fence was located approximately 1km downstream of the DFO field camp which is located 1km downstream of Little Tatsamenie Lake. In addition to and concurrent with the fence, angling (snagging) was used to capture live post-spawn Chinook upstream of the weir. Field staff were based at facilities owned by DFO.

Biological sampling included: length, sex, checks for spaghetti tags, radio tags, secondary marks or scar to identify spaghetti tag loss, observation of adipose presence for Chinook, scale collection for ageing, and tissue samples for genetic analysis. For age determination, five scales were collected from all sockeye and ten scales were collected from all Chinook. Scales were sent to DFO's Schlerochronology Lab at the Pacific Biological Station in Nanaimo, B.C for analysis, genetic tissue samples are archived for future use should funding become available.

Recovered coded wire tag (CWT) heads were tagged with a mouth cinch tag with the required shipping and handling information, frozen and transported to DFO offices in Whitehorse, Yukon. Samples were shipped by DFO to the J.O. Thomas and Associates Lab in Vancouver, B.C. for coded wire tag extraction and decoding. Data were uploaded into DFO's Mark Recovery Database.

3.0 Results and Discussion

3.1 Little Trapper Weir

Sockeye Salmon

The first sockeye were observed below the weir on 30 July (statistical week (SW) 31). Migration through the weir commenced 5 August 2017 (SW 31), and enumeration took place through 10 September 2017 (SW 37) when weir was removed.

A total of 6,552 sockeye salmon were enumerated through the weir over the eight weeks of operation. Of these, 800 sockeye were biologically sampled proportional to the run amounting to 12% of the total count. Of the 800 sampled fish, 338 were males and 462 were female. The sampling goal of 800 spread throughout the run was achieved.

Fish passing through the weir were inspected for spaghetti tags and radio tags. There were 154 spaghetti tags observed, of which 146 (95%) were recovered. No radio tags were observed. There

was no incidence of tag loss observed.

The 2017 sockeye weir count was close to the 10 year average (2007-2016) count of 6,616.

Table 1. Little Trapper weir summary

Sockeye Salmon		Male	Female	10 Yr Avg. 2007-2016
Weir count	6,552			6,616
Sampled	800	338	462	
Tag Loss	0			
Spaghetti tags recovered	145			
Radio Tags Recovered	0			

3.2 Kowatua River

Chinook Carcass Recovery

There were 238 Chinook samples obtained (127 male, 111 female) over the two and a half weeks of sampling. Biological samples included the recovery of six CWT heads, five spaghetti tags, and two radio tags.

Table 2. Kowatua Creek summary

Chinook Salmon		Male	Female	10 Yr Avg. 2007-2016
Sampled	238	127	111	273
Adipose clips (CWT)	6			
Spaghetti tags recovered	5			
Radio tags recovered	2			

3.2 Tatsatua Creek

Chinook Carcass Recovery weir and angling

The carcass weir provided 26 Chinook samples (22 male, 4 female), the angling (snagging) provided 209 samples (131 male, 78 female), for a total of 235 over the three weeks of the project. One CWT head and four spaghetti tags were recovered. The recent 10 year average number of samples collected is 231 at the weir and 279 via angling. The Taku River drainage wide Chinook run was well below average in 2017 making samples difficult to collect.

Table 3. Tatsatua Creek summary

Chinook Salmon		Male	Female	10 Yr Avg. 2007-2016
Sampled at carcass weir	26	22	4	231
Adipose clips (CWT)	0			
Spaghetti tags recovered	0			
Sampled with sport rod	209	131	78	279

Adipose clips (CWT)	1			
Spaghetti tags recovered	4			

4.0 Budget Summary

The expenditure of Northern Endowment Funds amounted to \$85,500 which matched the budgeted amount. The 10% holdback of \$8,550 is anticipated once the final project report is accepted by the Pacific Salmon Commission. A budget summary of expenditures can be referenced in Appendix C.

5.0 Conclusion

The project objectives for 2017 were achieved. A complete sockeye count was obtained at Little Trapper and sample goals were achieved. The number of samples collected from Kowatua River and Tatsatua Creek Chinook salmon comprised 49% of the escapement samples drainage-wide for the Taku River mark-recapture program (i.e. 473 of 974 samples).

Adult sockeye escapements into Little Trapper Lake as well as baseline age and length information serve as an index and provide insight on the system wide escapement estimates derived from the Taku River sockeye mark recapture program. The Chinook tag recovery and age, sex, length information contribute to the overall Taku River Chinook escapement estimates and biological metrics of the stock.

6.0 Acknowledgments

Brian Mercer of Metla Environmental Inc. delivered the contract supported by this funding. Colleen Claggett, Kylie Townend and Julie Bradford (DFO) assisted with the financial administration and accounting for this project.

7.0 Appendices

Appendix A: Sockeye Data

Appendix A-1. Daily counts of adult sockeye salmon passing through Little Trapper Lake weir, 2017.

DATE	Weir Count			Tag Scars		Tags		Total
	Not sampled	Sampled	Total	Fish Inspected	Observed	Recovered	Not recovered	
23-Jul	0	0	0	0	0	0	0	0
24-Jul	0	0	0	0	0	0	0	0
25-Jul	0	0	0	0	0	0	0	0
26-Jul	0	0	0	0	0	0	0	0
27-Jul	0	0	0	0	0	0	0	0
28-Jul	0	0	0	0	0	0	0	0
29-Jul	0	0	0	0	0	0	0	0
30-Jul	0	0	0	0	0	0	0	0
31-Jul	0	0	0	0	0	0	0	0
01-Aug	0	0	0	0	0	0	0	0
02-Aug	0	0	0	0	0	0	0	0
03-Aug	0	0	0	0	0	0	0	0
04-Aug	0	0	0	0	0	0	0	0
05-Aug	100	0	100	0	0	2	1	3
06-Aug	579	50	629	50	0	7	1	8
07-Aug	741	60	801	60	0	9	0	9
08-Aug	305	40	345	40	0	5	0	5
09-Aug	320	40	360	40	0	6	0	6
10-Aug	405	40	445	40	0	9	0	9
11-Aug	491	50	541	50	0	9	1	10
12-Aug	262	30	292	30	0	4	0	4
13-Aug	165	30	195	30	0	5	0	5
14-Aug	68	30	98	30	0	4	0	4
15-Aug	40	20	60	20	0	1	0	1
16-Aug	117	40	157	40	0	4	0	4
17-Aug	66	30	96	30	0	4	0	4
18-Aug	72	30	102	30	0	3	0	3
19-Aug	60	30	90	30	0	3	0	3
20-Aug	23	30	53	30	0	2	0	2
21-Aug	75	30	105	30	0	2	0	2
22-Aug	171	30	201	30	0	5	1	6
23-Aug	113	30	143	30	0	2	0	2
24-Aug	78	30	108	30	1	3	0	3
25-Aug	132	30	162	30	0	2	1	3
26-Aug	192	30	222	30	0	5	1	6
27-Aug	105	20	125	20	0	3	0	3
28-Aug	51	20	71	20	0	3	0	3
29-Aug	184	10	194	10	0	10	0	10
30-Aug	88	10	98	10	0	2	0	2
31-Aug	101	0	101	0	0	2	1	3
01-Sep	21	0	21	0	0	3	0	3
02-Sep	143	10	153	10	0	3	1	4
03-Sep	44	0	44	0	0	2	0	2
04-Sep	86	0	86	0	0	2	0	2
05-Sep	122	0	122	0	0	6	0	6
06-Sep	142	0	142	0	0	12	0	12
07-Sep	66	0	66	0	0	2	0	2
08-Sep	9	0	9	0	0	0	0	0
09-Sep	8	0	8	0	0	0	0	0
10-Sep	7	0	7	0	0	0	0	0
Total	5,752	800	6,552	800	1	146	8	154

Appendix B: Chinook Data

Appendix B-1. Daily counts of Chinook salmon sampled on Kowatua Creek, 2017.

DATE	Sampled			Adipose clips (CWT)		Tags
	Male	Female	Total	Recovered	Observed	Recovered
			0			
17-Aug			0			
18-Aug			0			
19-Aug			0			
20-Aug			0			
21-Aug			0			
22-Aug			0			
23-Aug		1	1			
24-Aug			0			
25-Aug	5	2	7			
26-Aug			0			
27-Aug	11	7	18	1		2
28-Aug			0			
29-Aug	3		3			
30-Aug	11	10	21			3
31-Aug	3	3	6			
01-Sep	6	3	9			
02-Sep	1		1			
03-Sep	22	27	49	3		1
04-Sep	15	21	36	1		
05-Sep	20	17	37	1		
06-Sep	25	17	42			1
07-Sep	2	2	4			
08-Sep	3	1	4			
Total	127	111	238	6	0	7

Appendix B-2. Daily counts of Chinook salmon carcasses sampled at Tatsatua Creek weir, 2017.

DATE	Weir Sample			Adipose Clip (CWT)	TAGS
	Male	Female	Total	Recovered	Recovered
21-Aug					
22-Aug			0		
23-Aug			0		
24-Aug			0		
25-Aug	1		1		
26-Aug		1	1		
27-Aug			0		
28-Aug	1		1		
29-Aug			0		
30-Aug			0		
31-Aug			0		
01-Sep	1		1		
02-Sep			0		
03-Sep	1		1		
04-Sep	1		1		
05-Sep	2		2		
06-Sep	1		1		
07-Sep	2	1	3		
08-Sep	2		2		
09-Sep	1	1	2		
10-Sep	7	1	8		
11-Sep	2		2		
Total	22	4	26	0	0

Appendix B-3. Daily counts of Chinook salmon sampled on Tatsatua Creek with sport rod, 2017.

DATE	Rod/snagging Sample			Adipose Clip (CWT)	TAGS
	Male	Female	Total	Recovered	Recovered
21-Aug	8	4	12		2
22-Aug	14	5	19		
23-Aug	19	4	23		1
24-Aug	7	3	10		
25-Aug	12	4	16		1
26-Aug	14	3	17		
27-Aug	8	8	16		
28-Aug	6	3	9		1
29-Aug	5	8	13		
30-Aug	3	7	10		1
31-Aug	6	6	12	1	1
01-Sep	1	3	4		
02-Sep	3	7	10		
03-Sep	3	1	4		
04-Sep	4	3	7		
05-Sep	3		3		
06-Sep	3	1	4		
07-Sep	5	1	6		
08-Sep	3	3	6		
09-Sep	4	3	7		
10-Sep		1	1		
Total	131	78	209	1	7

Appendix C: Expenditures

Fisheries and Oceans Canada - PSC Project Budget Financial Report

Name of Project and PSC#:

Taku L. Trapper Sockeye and Kowatua-Tatsatua Chinook, 2017 (NF-2017-I22)

EXPENDITURES

Labour					
DFO Employee Salaries and Benefits					
Position	Expenditures		Approved Budget	Total Expenditure	Variance
Total Expended	\$ -	Total Budget	\$ -	\$ -	\$ -
Subcontractors & Consultants					
Contract	Contract Amount Expended		Approved Budget	Total Expenditure	Variance
contract services	\$ 72,702.75		\$ 77,000.00		
Total Expended	\$ 72,702.75	Total Budget	\$ 77,000.00	\$ 72,702.75	\$ 4,297.25
Total Labour Summary			\$ 77,000.00	\$ 72,702.75	\$ 4,297.25
Site / Project Costs					
Item	Amount Expended		Approved Budget	Total Expenditure	Variance
Travel					
Small Tools & Equipment	\$ 747.01		\$ 1,900.00		
Site Supplies & Materials	\$ 3,497.67		\$ 5,100.00		
Equipment Rental					
Work & Safety Gear	\$ 482.98		\$ 500.00		
Repairs & Maintenance	\$ 8,069.59		\$ 1,000.00		
Permits					
Other costs					
Total Expended	\$ 12,797.25	Total Budget	\$ 8,500.00	\$ 12,797.25	\$ (4,297.25)
Total Site / Project Summary			\$ 8,500.00	\$ 12,797.25	\$ (4,297.25)
Training Costs					
Item	Amount Expended		Approved Budget	Total Expenditure	Variance
Name of course					
Total Expended	\$ -	Total Budget	\$ -	\$ -	\$ -
Total Training Summary			\$ -	\$ -	\$ -

Fisheries and Oceans Canada - PSC Project Budget Financial Report

Overhead / Indirect Costs					
Item	Amount Expended		Approved Budget	Total Expenditure	Variance
Office space, including utilities, etc.					
Insurance					
Office supplies					
Telephone & long Distance					
Photocopies & printing					
Indirect/overhead costs					
Administration and financial management					
(If the PSC contribution to indirect costs exceeds 20% of the total PSC grant submission of back-up documentation justifying the expense is required).					
Total Expended	\$ -		Total Budget	\$ -	\$ -
Total Overhead / Indirect Summary			\$ -	\$ -	\$ -

Capital Costs / Assets (Value > \$250.00)					
Item	Amount Expended		Approved Budget	Total Expenditure	Variance
Total Expended	\$ -		Total Budget	\$ -	\$ -
Total Capital Cost / Asset Summary			\$ -	\$ -	\$ -

Financial Report

Categories	Approved Budget (PSC Grant)	Project Expenditures	Variance
Labour	\$ 77,000.00	\$ 72,702.75	\$ 4,297.25
Site / Project Costs	\$ 8,500.00	\$ 12,797.25	\$ (4,297.25)
Training	\$ -	\$ -	\$ -
Overhead / Indirect Costs	\$ -	\$ -	\$ -
Capital Costs / Assets	\$ -	\$ -	\$ -
TOTAL	\$ 85,500.00	\$ 85,500.00	\$ -

PST Project Funding Grant Advance Amount Received	\$ (76,950.00)
PST Project Funding Grant Amount Remaining to be Paid	\$ (8,550.00)
Difference Between Grant Amount and Project Expenditures	\$ -

Project Manager Name

Aaron Foss

Project Manager Signature



Date

07 March 2018

DFO Responsibility Center Manager Name

Bill Waych

DFO Responsibility Center Manager Signature



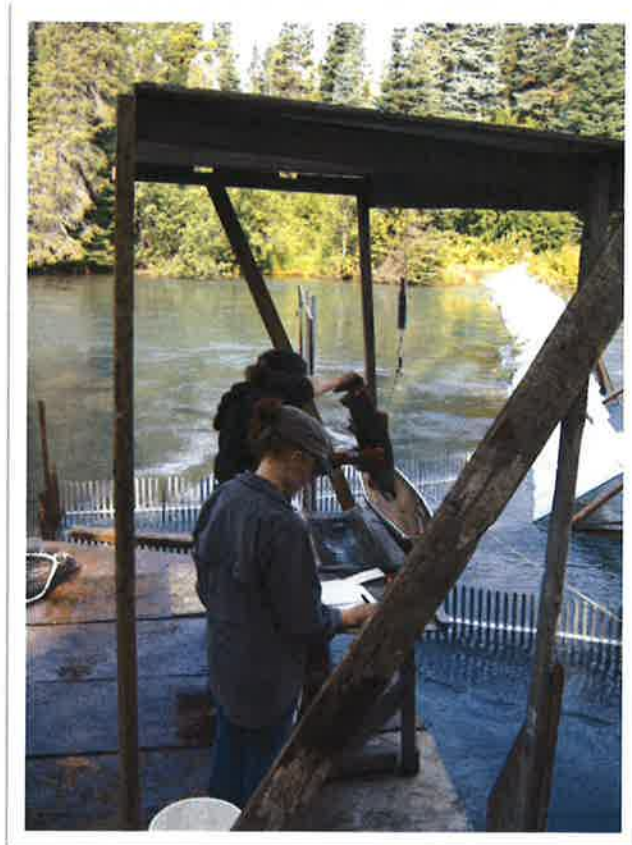
Date

Mar. 7/18

Appendix D: Photographs



Photograph 1. Little Trapper Lake Weir.



Photograph 2. Little Trapper weir - Sockeye sampling.



Photograph 3. Kowatua Creek - Chinook carcass sampling.



Photograph 4. Tatsatua Creek - Chinook sampling.