

Taku River Coho Salmon Escapement and Adult Sampling Augmentation 2015

(A study supported by the Northern Fund under the auspices of the Pacific Salmon Commission)

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Executive Summary

This report documents the Taku River coho salmon escapement augmentation project, specifically, sampling of immigrating adults.

The Northern Fund provided monies to augment the 2015 Taku River coho assessment program. This permitted the extension of the recapture effort for marked adults into October after commercial fishing activity had ceased. A total of eleven adipose clips were observed and 229 floy tags recovered in the commercial fishery and three adipose clips were observed and 50 floy tags recovered in the test fishery. Heads retrieved from marked fish were sent to Juneau, Alaska for coded-wire tag extraction.

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1.0 Introduction

The Taku River produces the largest run of coho salmon *Oncorhynchus kisutch* and Chinook salmon *Oncorhynchus tshawytscha* in British Columbia north of the Skeena River, and in Southeast Alaska (Figure 1; McPherson et al. 1998a; Yanusz et al. 1999).

Each spring since 1991, coho salmon smolts have been tagged with coded wire tags (CWTs) as they emigrate from the Taku River. Then in the following year, returning adults are sampled for these tags using fishwheels and set gillnets operated near Canyon Island in the lower Taku River. At the same time, adults are tagged as part of a two-event mark-recapture study to estimate the riverine abundance and sampled for age, sex, and length composition data. A short distance upriver, in Canada, adults are inspected in the commercial fishery. Typically, the commercial fishery ceases in late August and it is necessary to obtain tag ratio through a scientific fishing licence or a catch and release fishery. Data gathered from these efforts has provided estimates of riverine abundance and escapement since 1987, estimates of harvest, exploitation, survival, smolt abundance, and total run since 1992, and run forecasts since 1996. These combined efforts along with adult sampling programs in the various marine fisheries allow detailed stock assessment analyses including annual estimates of escapement necessary to refine escapement goals and forecast runs. Improved escapement goals and run forecasts along with in-season abundance estimates allow implementation of abundance-based management.

Coho salmon returning to the Taku River pass through an offshore troll fishery before entering inside waters where they encounter seine, drift gillnet, and recreational fisheries. After entering the river, the remaining coho salmon are harvested in a drift/set gillnet fishery in Canada.

The juvenile salmon portion of the mark-recapture experiment for estimating smolt abundance will be discussed further in the PSC funded project report "*Taku River Coho Salmon Smolt Tagging Augmentation 2015*".

2.0 Objectives

Department of Fisheries and Oceans Canada (DFO) personnel and/or contract personnel sampled adult coho salmon for marks (adipose clips), floy tags, age and size in the commercial and test fisheries on the Taku River in Canada from July into early October. The objective of this was to boost the recapture component of the mark-recapture study which will be used to estimate the number of coho smolts which emigrated from the Taku River in 2014, and to estimate the number of adult fish returning to the Taku River to spawn in 2015.

3.0 Methods

Mark-recapture methodology was used to estimate the abundance of coho salmon smolt emigrating from Taku River upstream of Canyon Island in 2014 (Figure 1). Smolt were injected with coded wire and marked with adipose fin-clips in the spring of the year as part of Event I of a two-event mark-recapture experiment. Returning adult coho salmon were inspected for marks in riverine fisheries in 2015 as part of Event II.

Coho salmon that had been marked as smolts in 2014 were recaptured as adults as they returned to the Taku River to spawn. This was "Event II" of the mark-recapture experiment for estimating smolt abundance. Adult coho salmon caught in the riverine commercial fishery were inspected for missing adipose fins (July to mid - September).

The marked fraction (number of fish missing adipose fins / total inspected) of coho salmon captured in gillnets will contribute to the estimation of the number of smolts that emigrated from the Taku River in 2014. Likewise, adult coho returning in 2016 will be inspected for marks applied in 2015.

To estimate escapement of adult coho salmon, floy tags are applied to returning adults at the ADF&G Fishwheel project at Canyon Island. As part of “Event II” of the mark-recapture study a reward of \$5 was provided for each floy tag returned from the riverine commercial fishery. The return of floy tags was stipulated in licence conditions for both the commercial fishery and the test fishery.

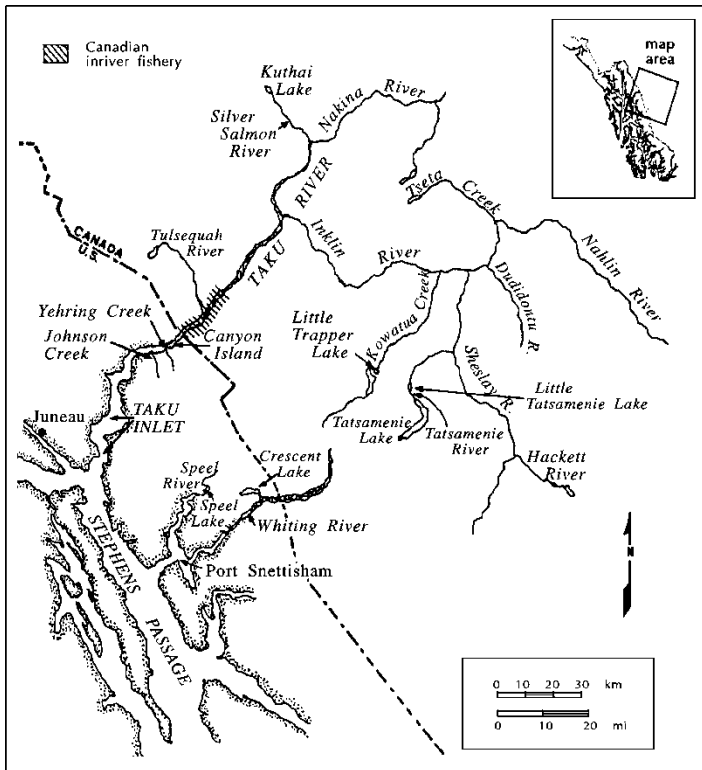


Figure 1. The Taku River drainage and Canadian commercial fishing area.

4.0 Results and Discussion

Adult coho were sampled in the commercial fishery which commenced in June, targeting sockeye and then coho. A total of 7,886 coho were caught; 4,647 (59%) were examined for marks (adipose clips) denoting presence of a CWT. Eleven marks were observed; as anticipated, CWT recovery was not possible since commercial fish were headed prior to being landed. Based on the commercial licence conditions and the \$5 reward offered for each floy tag it is assumed that the entire catch was examined for floy tags. A total of 229 floy tags were recovered in the commercial fishery.

In the coho test fishery which took place from September 13 to October 9, a total of 1,998 fish were caught/examined with three marks observed. Heads were recovered from the marked fish and sent to Juneau via float plane for CWT extraction. As with CWT release data, the recovery data will be stored in the ADF&G coded wire

tag website (www.taglab.org). Once this data set is verified, it will be forwarded to and inputted into the Regional Mark Processing Centre website (www.rmpec.com). A total of 50 floy tags were recovered in the test fishery.

Based on floy tag data, it is estimated that approximately 70,000 adult coho had migrated into Canada by the end of the fishing season in 2015 (PSC 2016). Subtracting the fishery catches, approximately 60,000 of these fish escaped to spawning areas. Mark/CWT data from the fisheries will be analyzed in the winter of 2015-16; an estimate of the number of smolts that emigrated in 2015 will be generated for future publication.

Table 1. Total catches, Adipose clips observed and floy tags recovered in 2015 by statistical week.

Statistical Weeks	Week Ending	Commercial Catch	Test Catch	Adipose Clips Observed	CW Tags Recovered	Floy tags Recovered
23	06-Jun					
24	13-Jun					
25	21-Jun					
26	27-Jun					
27	04-Jul	1				
28	11-Jul	8				
29	18-Jul	0				
30	25-Jul	405		1		8
31	01-Aug	1,019				20
32	08-Aug	470		1		17
33	15-Aug	532		1		20
34	22-Aug	809		1		14
35	29-Aug	1,506		2		65
36	05-Sep	2,511		3		81
37	12-Sep	633		2		4
38	19-Sep		500	1	1	6
39	26-Sep		500	1	1	19
40	03-Oct		474	1	1	18
41	10-Oct		524			7
Total		7,894	1,998	14	3	279

5.0 Budget and Project Operations

As presented in Appendix 2, the expenditures of Northern Funds amounted to \$64,800. The 10% holdback of \$6,480 is anticipated once the final project report is accepted by the Pacific Salmon Commission.

A summary of Fund expenditures in relation to budgeted amounts is as follows:

Description	Budget	Expenditure	Balance
Contract and fish tag	\$64,800	\$64,800	\$0
Grand Total	\$64,800	\$64,800	\$0

6.0 Conclusion

The planned and actual deliverables of the project were as follows:

1. Sampling adult coho returns for adipose clips and floy tags on the Taku River upstream of the Canada/U.S. border from mid-August through to early October; estimated minimum sample 3,000 fish.

From July 14 to September 13, a total of 4,647 coho were examined in the commercial fishery with eleven marks observed and 229 floy tags recovered. From September 13 to October 9, a total of 1,998 coho were caught /examined in a test fishery with three marks observed and 50 floy tags recovered.

The activities supported by this project will contribute to the assessment of current productivity, abundance, and exploitation of Taku River coho salmon.

7.0 Acknowledgements

Kirstie Falkevitch, Michael Lake, Mathieu Ducharme and Sean Stark of DFO conducted the fishery sampling supported by this funding. Individuals fishing commercially and/or for Taku Wild captured coho and recovered tags. Colleen Claggett and Marnie Barteaux (DFO) assisted with the financial administration and accounting for this project.

8.0 Literature Cited

- McPherson, S. A., D. R. Bernard, S. K. Kelley, P. A. Milligan, and P. Timpany. 1998a. Abundance of Chinook salmon in the Taku River in 1997. Alaska Department of Fish and Game, Division of Sport Fish, Fishery Data Series Report 98-41, Anchorage.
- Yanusz, R. J., McPherson, S. A., and D. R. Bernard. 1999. Production of coho salmon from the Taku River, 1997-1998. Alaska Department of Fish and Game, Division of Sport Fish, Fishery Data Series Report 99-34, Anchorage.
- PSC (Pacific Salmon Commission). 2016. Preliminary estimates of transboundary river salmon production, harvest, and escapement and a review of joint enhancement activities in 2015. Transboundary Technical Committee Report.

Appendix 1: Daily catches, Adipose clips observed and floy tags recovered in 2015.

Statistical Weeks	Date	Commercial Catch	Test Catch	Adipose Clips Observed	CW Tags Recovered	Floy tags Recovered
27	29-Jun	1				
27	30-Jun					
27	01-Jul					
27	02-Jul					
27	03-Jul					
27	04-Jul					
28	05-Jul	8				
28	06-Jul					
28	07-Jul					
28	08-Jul					
28	09-Jul					
28	10-Jul					
28	11-Jul					
29	12-Jul					
29	13-Jul					
29	14-Jul					
29	15-Jul					
29	16-Jul					
29	17-Jul					
29	18-Jul					
30	19-Jul	44				2
30	20-Jul	72		1		1
30	21-Jul	173				3
30	22-Jul	116				2
30	23-Jul					
30	24-Jul					
30	25-Jul					
31	26-Jul	291				8
31	27-Jul	180				2
31	28-Jul	114				1
31	29-Jul	147				3
31	30-Jul	279				6
31	31-Jul					
31	01-Aug					
32	02-Aug	125				13
32	03-Aug	179		1		2
32	04-Aug	166				2
32	05-Aug					
32	06-Aug					
32	07-Aug					
32	08-Aug					
33	09-Aug	308				10
33	10-Aug	122		1		6
33	11-Aug	102				4
33	12-Aug					
33	13-Aug					
33	14-Aug					
33	15-Aug					
34	16-Aug	433				10
34	17-Aug	298				2
34	18-Aug	78				2
34	19-Aug			1		
34	20-Aug					
34	21-Aug					

34	22-Aug					
35	23-Aug	491				12
35	24-Aug	454				29
35	25-Aug	561		1		24
35	26-Aug			1		
35	27-Aug					
35	28-Aug					
35	29-Aug					
36	30-Aug	547				15
36	31-Aug	592		1		22
36	01-Sep	603				27
36	02-Sep	769				17
36	03-Sep			2		
36	04-Sep					
36	05-Sep					
37	06-Sep	633				4
37	07-Sep			2		
37	08-Sep					
37	09-Sep					
37	10-Sep					
37	11-Sep					
37	12-Sep					
38	13-Sep		115			
38	14-Sep		141			2
38	15-Sep		158	1	1	3
38	16-Sep		61			
38	17-Sep		25			1
38	18-Sep		0			
38	19-Sep		0			
39	20-Sep		175			10
39	21-Sep		140	1	1	2
39	22-Sep		101			5
39	23-Sep		42			1
39	24-Sep		42			1
39	25-Sep					
39	26-Sep					
40	27-Sep		134			7
40	28-Sep		130	1	1	5
40	29-Sep		81			1
40	30-Sep		17			1
40	01-Oct		34			2
40	02-Oct		43			
40	03-Oct		35			2
41	04-Oct		155			1
41	05-Oct		126			2
41	06-Oct		110			
41	07-Oct		89			1
41	08-Oct		30			1
41	09-Oct		14			2
41	10-Oct					
42	11-Oct					
42	12-Oct					
42	13-Oct					
42	14-Oct					
42	15-Oct					
Total		7,886	1,998	14	3	279

Appendix 2: Expenditures

Project Budget Form - DFO

Name of Project: Taku River Coho Adult Augmentation 2015

ELIGIBLE COSTS	BUDGET	OTHER FUNDING	CONTRIBUTION FUNDING	CONTRIBUTION FUNDING	CONTRIBUTION FUNDING
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Labour

Wages & Salaries

Position	# of crew	# of work days	hrs per day	rate per hour	Total (PSC + In-kind + cash)	In-Kind & Cash	PSC Amount	Actual Expenditures	Variance
DFO Stock Assessment Biologist Bi-3	1	7	7.5		47	2,468			
DFO Stock Assessment Biologist Bi-2	1	7	7.5		36	1,890			
DFO Fishery Technician EG 3 (includes OT)	2	35	7.5		29	22,838			
Person Days (# of crew x work days)		49		sub total		27,195			

Labour - Employer Costs (percent of wages subtotal amount)

	rate	20%	sub total	5,439	5,439	-		
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Subcontractors & Consultants	# of crew	# of work days	hrs per day	rate per hour					
Adult tag recovery (Event II)	6	30	8	\$45	64,800		64,800	64,800	-
Insurance if applicable									
	114			sub total	64,800		64,800	64,800	-

Volunteer Labour	# of crew	# of work days	hrs per day						
Skilled									
Un-skilled									
Insurance if applicable									
				sub total					
Total Labour Costs					97,434	32,634	64,800	64,800	-

Site / Project Costs	Detail (use additional page for details if needed)								
Travel (do not include to & from work)									
Small Tools & Equipment									
Site Supplies & Materials									
Equipment Rental									
Work & Safety Gear									
Repairs & Maintenance									
Permits									
Technical Monitoring									
Other site costs									
Total Site / Project Costs					-	-	-	-	-

Project Budget Form - DFO (continued)

ELIGIBLE COSTS				BUDGET	OTHER FUNDING	CONTRIBUTION FUNDING	CONTRIBUTION FUNDING	CONTRIBUTION FUNDING
Training (e.g Swiftwater, bear aware, electrofishing, etc).				Total (PSC + In-kind + cash)	In-Kind & Cash	PSC Amount	PSC Amount	PSC Amount
Name of course	# of crew	# of days						
				-	-			
			Total Training Costs	-	-	-	-	-
Overhead / Indirect Costs (not to exceed 20% of PSC Amount)								
Office space; including utilities, etc.								
Insurance								
Office supplies								
Telephone & long Distance					-			
Photocopies & printing								
Other overhead costs		Admin Overhead @ 3%		2,923	2,923			
			Total Overhead Costs	2,923	2,923	-	-	-
Capital Costs / Assets								
Detail (use additional page for details if needed)								
Assets are things of value that have an initial cost of \$250 CAN or more and which can be readily misappropriated for personal use or gain or which are not, or will not be, fully consumed during the term of the project.								
				-				
				-				
				-				
				-				
			Total Capital Costs	-		-	-	-
			Project Total Costs Cdn\$	100,357	35,557	64,800	64,800	-
DFO Budget Summary (PSC + in-kind + cash)								
			Total				Balance	\$ -
							1st payment	\$ 58,320.00
							10% holdback	\$ 6,480.00
							Total	\$ 64,800.00
Total Labour Costs			97,434					
Total Site / Project Costs			-					
Total Training Costs			-					
Total Overhead Costs			2,923					
Total Capital Costs			-					
		Project Total	100,357					

Appendix 3: Photographs



Photograph 1. Fishery catches at landing station.



Photograph 2. Catch sampling at landing station.