Tulalip Tribes Natural Resources Department Report

SNOQUALMIE RIVER JUVENILE SALMON OUT-MIGRATION STUDY PROGRESS REPORT

February – June 2015

by
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2015

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i. Acknowledgements
The 2015 Snoqualmie River Juvenile Salmon Out-Migrant Study was made possible by the following funding sources:

- King County Flood Control District Cooperative Management Grant Funds
- NOAA Pacific Coastal Salmon Recovery Funds
- Washington State Department of Fish and Wildlife
- Pacific Salmon Commission

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1. Introduction

In May of 1999, the National Marine Fisheries Service (NMFS) listed the Puget Sound Chinook salmon as threatened under the federal Endangered Species Act (ESA). This listing included Chinook salmon from the Snohomish River Basin (Skykomish and Snoqualmie populations). Similarly, decreases in many runs of Puget Sound Coho salmon have resulted in a designation as a species of concern under ESA. The recovery of these species depends upon improving the effectiveness of habitat, harvest, and hatchery management across the basin. In order to achieve such improved effectiveness, additional information is necessary to fill important data gaps within the Snohomish system, including information on Chinook and Coho salmon abundance, productivity, spatial structure, and diversity (Snohomish Basin Salmonid Recovery Technical Committee, 2005). Information about the trends and inter-annual variability in these population parameters is critical to inform salmon recovery efforts, provides basic information on the productivity and capacity of the system, and can lead to significant improvements in harvest management modeling and run forecasting. Additionally, the monitoring of production and survival along with other physical, chemical, and biological conditions provides a means to evaluate recovery actions, habitat conditions, and potential ecological trajectories in the basin**.**

A key project helping to provide information on Snohomish salmon populations has been the operation of two rotary screw traps in the Skykomish and Snoqualmie rivers. Over the last 12 years, these projects involved trapping and enumerating juvenile Chinook and Coho salmon (as well as several un-targeted species) as they emigrate from the Snohomish River Basin to the Puget Sound. The goals of these trapping efforts are to estimate Chinook and Coho salmon natural production, migration patterns, and freshwater survival. These goals are accomplished through the direct quantification of juvenile salmon emigrations, evaluation of trap efficiency, and assessment of influential environmental attributes (Kubo, Finley, Nelson, 2013).

The Tulalip Tribes (TTT) trapping project has been classified on a multi-agency basis as a project of high priority for monitoring juvenile salmonids in the Snohomish River basin. TTT has worked in close collaboration with the Washington Department of Fish and Wildlife (WDFW), NOAA Fisheries, University of Washington (UW), Long Live the Kings (LLTK), Seattle City Light (SCL), U.S. Geological Survey (USGS), Northwest Indian Fisheries Commission (NWIFC), and other agencies to aid in better co-management of Snohomish basin salmon and steelhead stock assessment monitoring and run forecasting. Cooperative management agreements and in-kind contributions have been made to these agencies regularly from TTT in order to better assist in monitoring the status and trends of Snohomish Basin salmonid stocks.

2. Snoqualmie River Trapping Site Location and Characteristics.

The Snoqualmie trap is located on the Snoqualmie River in Duvall, WA in a straight section of the channel which flows in a northerly direction at river mile 12.2. The Snoqualmie River at this point has a wetted width of ~142 ft., bank full width of ~210 ft, maximum bank full depth of ~23.5 ft, and a summer low-flow level of ~5 ft. Water surface velocity is ~3-4 ft./sec., summer low flow discharge is ~847 cfs, and mean annual discharge is ~3,800 cfs. The channel gradient is <1% and the substrate is principally sand and silt with some gravel and cobble on the western side of the channel. The land use adjacent to the trap is principally agriculture with riparian vegetation limited to the banks (e.g. <30 ft.). The riparian zone principally consists of grass, shrubs, and a few scattered willow and cottonwood trees. At the immediate trap site, the left bank is composed of a steep slope vegetated with mixed deciduous trees and an understory of blackberry and salmonberry (leading to West Snoqualmie Valley Rd NE). The right bank is steeply cut and leads to an active horse and cattle pasture. Riparian vegetation on the right bank is principally blackberry with an occasional alder and cottonwood. In 2003, the landowner had a fence built around the pasture on the right bank creating a buffer zone of ~50 ft. between the pasture and the river bank. This buffer was planted with an assortment of native riparian vegetation. (Kubo, Finley, Nelson, 2013).

Figure 1. Aerial photograph of the trap site at river mile 12.2 on the Snoqualmie River in Duvall, WA. The red dot indicates the approximate trap fishing position.

3. Summary of activities completed during the sampling season.

On February 2nd installation of the rotary screwtrap began and full trapping operations commenced on February 12th. The season ended on June 5th. The trap was fished for approximately 1017 hours over 70 days within a 16 week period. 655 of those hours were fished at night representing 64% of total trapping effort. No scheduled sampling events were cancelled or rescheduled during this five month period due to unfavorable sampling conditions (i.e. high debris and discharge levels). During the sampling season 3,236 salmon and trout were captured, counted and released. Of that number, 2,146 were sub-yearling Coho accounting for 66.3% of the total catch. Captured unmarked Chinook included 82 sub-yearlings and 13 yearlings. The number of Chinook sub-yearlings caught at the Snoqualmie River trap has varied widely from year to year, with the catch in 2015 being the lowest documented in project history; 81.5% lower than the project average (2001-2015 average; 444). Captured unmarked Coho included 678 yearlings and 2,146 sub-yearlings. The number of unmarked Coho yearlings caught was lower than last year, and is 42.6% lower than the project average (2001-2015 average: 1,181) (Table 1). During the trapping and handling process a total of 2 salmonid mortalities were reported of which 1 was a Chinook sub-yearling. Mortality as a percentage of the total salmonid catch was approximately 0.0006% lower than 2014 mortality rates, and considerably below project averages (Table 5).

Year	Effort (Hours)	0+ Chinook	1+ Coho	Chinook CPUE	Coho CPUE
2001	509	619	553	1.22	1.09
2002	780.3	653	1894	0.84	2.43
2003	945.5	882	1305	0.93	1.38
2004	1056	611	1127	0.58	1.07
2005	1017.8	677	1187	0.67	1.17
2006	992	761	2023	0.77	2.04
2007	509.5	120	615	0.24	1.21
2008	317.9	163	587	0.51	1.85
2009	632.1	259	754	0.41	1.19
2010	1157.8	357	1149	0.31	0.99
2011	500.8	284	1662	0.57	3.32
2012	847.2	377	1384	0.44	1.63
2013	1217.93	615	1718	0.50	1.41
2014	796.8	196	1084	0.25	1.36
2015	1017	82	678	0.08	0.67
Project Average		*444*	*1181*	0.55	1.52

Table 1. Annual sampling effort and catch totals for sub-yearling Chinook and yearling Coho at the Snoqualmie River Rotary screwtrap 2001-2015 (preliminary data).

A total of 15 trap efficiency tests (7 with Chinook sub-yearlings and 8 with Coho yearlings) were conducted on 15 different days throughout the 2015 sampling season (Table 2.). During these tests, groups of hatchery origin juvenile salmon were collected from Wallace River Hatchery, marked with biological dye, and released over a mile upstream of the trap site. These releases were conducted weekly throughout the duration of the sampling season unless the river was deemed unfishable. Following each release the trap was operated continuously (except during debris removal) for a minimum of 36 hours. Efficiency calculations are expressed as the percentage of captured dyed fish in relation to the total number of dyed fish released. The results of these tests are still being evaluated; however preliminary calculations suggest that the trap was operating at an efficiency rate of 1.40% for Chinook sub-yearlings and 0.64% for Coho yearlings during the 2015 sampling season (Table 2). The 2015 sub-yearling Chinook efficiency is close to the documented seasonal average for this trapping location (2001-2013 average: 1.51%), whereas Coho efficiency rates were slightly lower than expected norms observed at this site (2001-2013 average: 0.90%). On 05/27/15 a release was attempted, but ultimately failed due to a high mortality rate. The cause of the die off was very likely high temperatures and this release was omitted from the release data that has been presented, this release has been omitted from the report. During the 2015 season, trapping equipment was inspected and monitored frequently and the trap was found to be in fully operational condition with no escape paths detected and no major equipment malfunctions. Due to record setting low river levels in 2015, the cone revolution speed was extremely low during almost all sampling events. It is plausible that the lower overall river velocity and low average cone revolutions played a factor in overall lower catch rates both for the efficiency trials, as well as catches in general.

Year	River	Release Date	0+ CK Eff	1+ CO Eff
2015	Snoqualmie	2/24/2015	***1.10%***	
2015	Snoqualmie	3/4/2015	***2.20%***	
2015	Snoqualmie	3/10/2015	***1.50%***	
2015	Snoqualmie	3/18/2015	***1.90%***	
2015	Snoqualmie	3/24/2015	***1.10%***	
2015	Snoqualmie	4/1/2015	***0.95%***	
2015	Snoqualmie	4/7/2015	***1.06%***	
2015	Snoqualmie	4/15/2015		***1.55%***
2015	Snoqualmie	4/21/2015		***0.65%***
2015	Snoqualmie	4/29/2015		***0.70%***
2015	Snoqualmie	5/5/2015		***0.70%***
2015	Snoqualmie	5/13/2015		***0.45%***
2015	Snoqualmie	5/19/2015		***0.45%***
2015	Snoqualmie	5/27/2015		*OMITTED*
2015	Snoqualmie	6/2/2015		***0.00%***
		2015 Avg. Total	1.40%	0.64%

Table 2. Efficiency release dates and re-capture (efficiency) percentages at the Snoqualmie trap site; 2015.

After a preliminary review of the data it appears that catch per unit effort (CPUE) for wild Chinook sub-yearlings was highest during Statistical Week (SW) 12 when 0.48 fish per hour were captured. The timing of this peak has varied from year to year, and does not exhibit the observed consistency documented for yearling Coho in the Snoqualmie. The Coho yearling outmigration demonstrated a very clear peak in SW 18 when 4.16 fish per hour were captured (Figure 2). The timing of this peak is consistent with the timing observed in all other years of the trapping project which generally occurs during SW 18-20. Table 5 shows a monthly breakdown of catch numbers for all species and Table 3 shows statistical weeks and the corresponding dates.

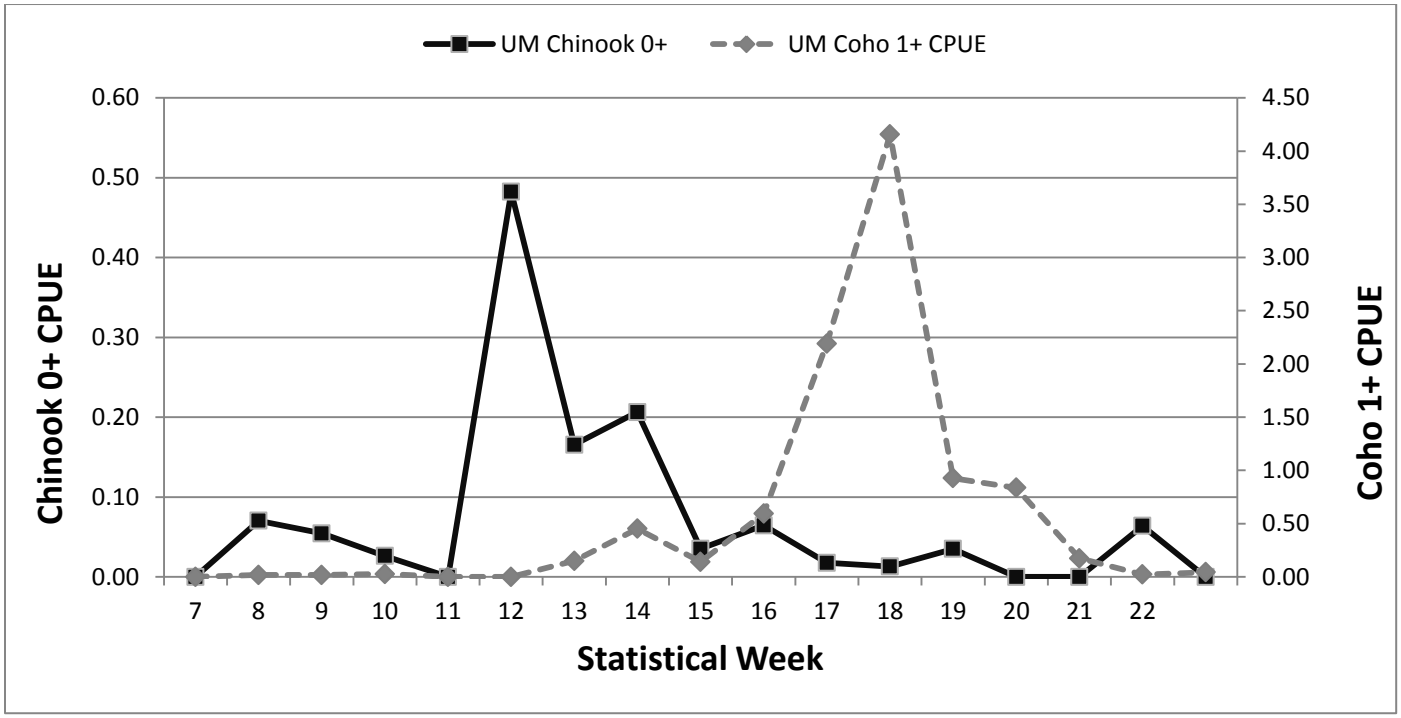

Figure 2. Chinook sub-yearling (age 0+) and coho yearling (age 1+) migration patterns observed during 2015 at the Snoqualmie River trap, river mile 12.2 (preliminary data).

	2015			
Year	StatWeek	BegWeek	MidWeek	EndWeek
2015	7	2/8/2015	2/11/2015	2/14/2015
2015	8	2/15/2015	2/18/2015	2/21/2015
2015	9	2/22/2015	2/25/2015	2/28/2015
2015	10	3/1/2015	3/4/2015	3/7/2015
2015	11	3/8/2015	3/11/2015	3/14/2015
2015	12	3/15/2015	3/18/2015	3/21/2015
2015	13	3/22/2015	3/25/2015	3/28/2015
2015	14	3/29/2015	4/1/2015	4/4/2015
2015	15	4/5/2015	4/8/2015	4/11/2015
2015	16	4/12/2015	4/15/2015	4/18/2015
2015	17	4/19/2015	4/22/2015	4/25/2015
2015	18	4/26/2015	4/29/2015	5/2/2015
2015	19	5/3/2015	5/6/2015	5/9/2015
2015	20	5/10/2015	5/13/2015	5/16/2015
2015	21	5/17/2015	5/20/2015	5/23/2015
2015	22	5/24/2015	5/27/2015	5/30/2015
2015	23	5/31/2015	6/3/2015	6/6/2015
2015	24	6/7/2015	6/10/2015	6/13/2015
2015	25	6/14/2015	6/17/2015	6/20/2015

Table 3. Statistical weeks and corresponding dates for 2015 sampling season.

In general, salmonid catch rates on the Snoqualmie trap have exhibited seasonal variability throughout the duration of the project primarily due to fluctuating sampling conditions and the strength of a given years outmigrant cohort. Analysis of seasonal CPUE averages for sub-yearling Chinook and yearling Coho in 2015 indicate a lower than normal capture rate for both of these species with sub-yearling Chinook numbers falling significantly lower than project averages (Table 1, Figure 3).

The overall CPUE for sub-yearling Chinook in the Snoqualmie River was alarmingly low in 2015 at approximately .08 fish per hour of effort representing the lowest annual CPUE recorded in project history (2001-2015). This is approximately 85% lower than the project average for sub-yearling Chinook (Project average; 0.55 fish per hour). Chinook efficiency rates closely matched seasonally documented averages and likely did not play a role in the lower overall sub-yearling Chinook catches in 2015. Lower CPUE and a lower overall total catch are likely primarily due to a small overall outmigrant cohort size for sub-yearling Chinook in 2015. Taking into account seasonal variability and sampling conditions, the total annual catch rates and CPUE for sub-yearling Chinook have both exhibited a clear gradual decreasing trend throughout the project duration (Figure 3).

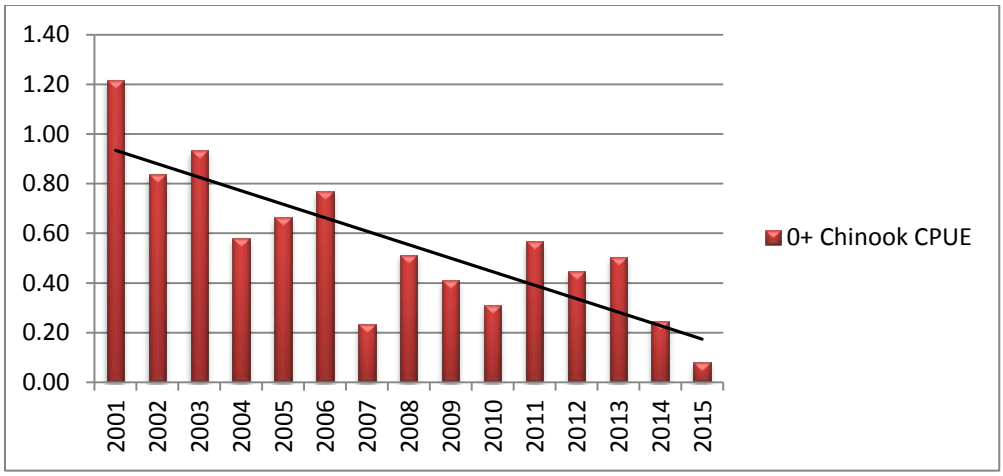

Figure 3. Sub-yearling Chinook average CPUE at the Snoqualmie trap; 2001-2015.

Yearling Coho catch rates have in general remained fairly consistent throughout the project duration with some observed seasonally variability dependent upon river conditions and the size of a given years outmigrant cohort (Figure 4). In 2015 the average yearling Coho CPUE was 56% lower than documented averages at only .67 yearling Coho per hour sampled (Project average; 1.52 fish per hour). Yearling Coho catches in 2015 were the lowest recorded in project history (2001-2015). This number is likely due to a combination of lower overall yearling Coho efficiency rates and a smaller outmigrant cohort size in 2015. Yearling Coho total annual catch, and CPUE averages do not show a clear increasing or decreasing trend at the Snoqualmie trap and appear to be remaining fairly steady (Figure 4).

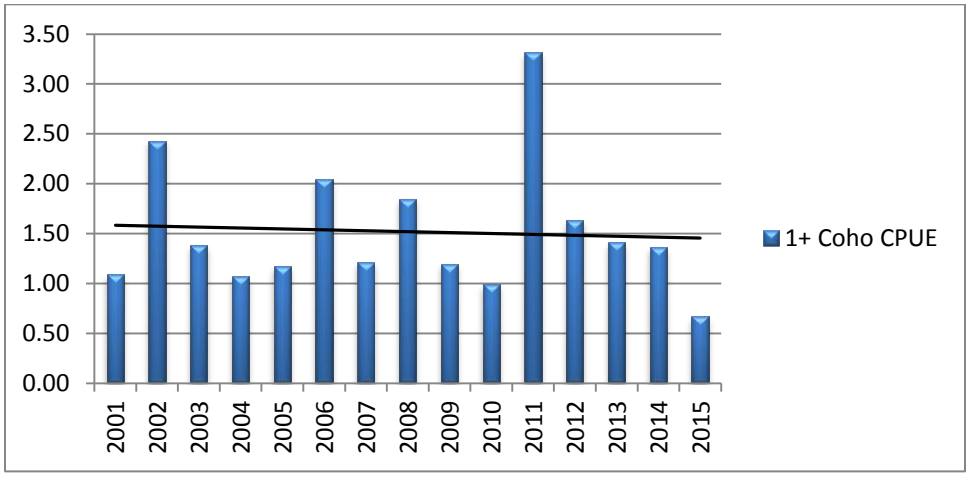

Figure 4. Yearling Coho average CPUE at the Snoqualmie trap; 2001-2015.

3.1 Additional Studies

Genetic Mark Recapture Parantage Assignment - WDFW

Beginning in 2012 under a funded cooperative management agreement with WDFW, TTT began assisting in a basinwide genetic mark and recapture (GMR) study being conducted by WDFW. DNA samples were collected at the Snoqualmie trap site for genetic parentage-assignment analyses of juvenile Chinook salmon in an attempt to further evaluate stock-specific production estimates and abundance. Under WDFW GMR project protocol all unmarked (adipose intact) Chinook (both 0+ and 1+ size classes) caught in the trap were clipped for DNA sampling. During the 2015 monitoring season approximately 95 upper-caudal DNA samples were taken from a mix of sub-yearling and yearling unmarked Chinook juveniles. This number accounts for the lowest number of Chinook DNA samples taken to date at the Snoqualmie trap to date, and is significantly lower than previous years dating back to 2012.

In 2015, juvenile Chinook salmon were captured in eight-foot screw traps operated at RM 12 on the Snoqualmie River. Captured individuals were netted from the live box and held in five-gallon buckets. Fish were placed into a dishpan where they were identified to species, and examined for marks (adipose fin clips, CWT). Unmarked/untagged Chinook were measured and FL recorded in millimeters. For DNA parentage analysis, a small piece of caudal fin tissue was collected from all unmarked/untagged subyearling Chinook juveniles and immediately stored in 95% ethanol at ambient temperatures. Unmarked and untagged subyearling Chinook were presumed to be of natural-origin given that all regional hatchery Chinook production is marked through a combination of adipose fin clips and CWTs, less a very small proportion that end up not being marked due to clip and tag loss (Seamons, et. al, 2015). In 2015, 90 upper-caudal DNA samples were taken from a mix of sub-yearling and yearling unmarked Chinook juveniles. This number is significantly lower than project averages dating back to beginning of the GMR study at the Snoqualmie in 2012 and is represents the lowest recorded incidence of Chinook encounters to date (Table 4).

Snoqualmie River	
Year	**Chinook Samples Taken**
2012	376
2013	844
2014	305
2015	90
Total to Date	1,615

Table 4. GMR Sample Totals 2012-2015

Salish Sea Marine Survival Project

Beginning in 2014 Tulalip has made in-kind contributions to an international study lead by Long Live the Kings (LLTK) and the Pacific Salmon Foundation (PSF) of Canada examining the primary factors affecting the survival of juvenile salmon and steelhead in the Salish Sea. According to the Salish Sea Marine Survival Project Website the aim of the project is to:

> *Leverage human and financial resources from the United States and Canada to determine the primary factors affecting the survival of juvenile salmon and steelhead in the Salish Sea. It is the largest and most important research of its kind in the shared waters of British Columbia and Washington State, addressing a key uncertainty impeding salmon recovery and sustainable fisheries. The project will, for the first time, undertake a comprehensive study of the physical, chemical and biological factors impacting salmon survival, in order to improve our collective understanding of salmon in saltwater, facilitating smarter management and stronger returns.*

> *Over 40 organizations, representing diverse philosophies and encompassing most of the region's fisheries and marine research and management complex, are working together on this massive transboundary effort. And, the Pacific Salmon Foundation (PSF) and Long Live the Kings (LLTK) are coordinating it. (http://www.marinesurvivalproject.com).*

The bottom-up sampling portion of the study is aimed to evaluate the role and drivers of juvenile size-selective mortality rates through the use of DNA and scale sample analysis. In cooperation with LLTK and NOAA fisheries TTT took scale samples from juvenile Chinook and Coho salmon at the Snoqualmie River smolt trap. Chinook scale samples taken for the WDFW GMR were shared between LLTK and WDFW to facilitate the needs of both groups. In addition to these samples TTT also sampled and provided scales from juvenile Coho salmon at the Snoqualmie trap in both 2014 and 2015. In 2015, 15 scale samples were collected from juvenile Chinook salmon, and 57 scale samples were collected from juvenile Coho. In addition to the scale samples taken, caudal tissue for DNA analysis was collected from 92 juvenile Chinook.

4. Project status and difficulties.

In terms of trap operation the 2015 trapping season went very well. Total trapping effort (approximately 1000 hours) and sample scheduling were not adversely impacted by variability in weather conditions and hydrology. In past seasons, hazardous river conditions and flooding have caused cancellations and unscheduled gaps in trap operation. In 2015 the Snoqualmie River was hit with record breaking drought conditions, low snow pack, and high temperatures resulting in river levels lower than any historical records. Low river levels resulting in low cone rotation speeds in the spring likely played a role in the comparatively low yearling Coho CPUE rates experienced in 2015, but were likely not the main driving force behind these lower than usual encounter rates. Yearling Coho catch efficiency rates closely matched the project average, and the lower than normal encounter rates are likely primarily due to a smaller overall outmigrant cohort size in 2015. These low flow rates were, however, primarily responsible for the completion of the season in June, at which point river velocities were below the minimum requirement to rotate the trap cone. Although the season ended earlier than is generally anticipated, the sampling window captured both the peak of the Chinook and Coho outmigration window. All trapping equipment including the trap itself, the boat, and all associated supplies were in full working order and operated as expected throughout the duration of the 2015 season.

5. References

Kubo, J., Finley, K., Nelson K. 2013. 2000-2012 Skykomish and Snoqualmie Rivers Chinook and Coho Salmon Out-Migration Study. Tulalip Tribes Natural Resource Division, Tulalip WA.

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November, 2015

Table 5: Snoqualmie River trap catch and mortalities 2015

(Data is preliminary)

February

	Chinook		*Coho*		*Chum*	*Pink*	*Steelhead*								
	0+	*1+*	*0+*	*1+*	*0+*	*0+*	*Unm Smolts*	*Mark Smolts*	*Resident Rainbow*	*Cut./Rain. Trout Fry/Parr*	*Total Salmonid Catch*	*Lamp*	*Sunfish*	*Sculpin spp.*	*Stickle-back*
Day	(33.3 hours of effort)														
Catch	2	0	1	0	0	0	0	0	0	0	3	1	0	0	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Night	(87.6 hours of effort)														
Catch	5	2	0	2	2	0	0	0	0	0	12	51	0	1	1
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Totals	(120.9 hours of effort)														
Catch	7	2	1	2	2	0	0	0	0	0	15	52	0	1	1
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

March

	Chinook		*Coho*		*Chum*	*Pink*	*Steelhead*								
	0+	*1+*	*0+*	*1+*	*0+*	*0+*	*Unm Smolts*	*Mark Smolts*	*Resident Rainbow*	*Cut./Rain. Trout Fry/Parr*	*Total Salmonid Catch*	*Lamp*	*Sunfish*	*Sculpin spp.*	*Stickle-back*
Day	(89.6 hours of effort)														
Catch	13	0	64	3	45	0	0	0	0	0	125	1	1	0	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Night	(207.3 hours of effort)														
Catch	35	0	1378	24	129	0	0	0	0	0	1567	50	3	7	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Totals	(296.9 hours of effort)														
Catch	48	0	1442	27	174	0	0	0	0	0	1692	51	4	7	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 5: Snoqualmie River trap catch and mortalities 2015

(Data is preliminary)

April

	Chinook		Coho		Chum	Pink	Steelhead								
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts	Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
Day	(121.8 hours of effort)														
Catch	10	2	100	26	69	0	0	0	0	0	208	3	0	1	5
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Night	(182.9 hours of effort)														
Catch	11	4	595	463	48	0	4	0	0	0	1138	54	5	17	136
Morts.	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0
Monthly Totals	(304.7 hours of effort)														
Catch	21	6	695	489	117	0	4	0	0	0	1346	57	5	18	141
Morts.	0	0	0	1	0	0	0	0	0	0	1	0	0	0	0

May

	Chinook		Coho		Chum	Pink	Steelhead								
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts	Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
Day	(102.4 hours of effort)														
Catch	1	0	0	2	2	0	0	0	0	0	5	2	0	0	7
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Night	(145.8 hours of effort)														
Catch	5	3	8	156	0	0	1	0	0	0	174	70	0	4	108
Morts.	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Monthly Totals	(248.2 hours of effort)														
Catch	6	3	8	158	2	0	1	0	0	0	179	72	0	4	115
Morts.	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Table 5: Snoqualmie River trap catch and mortalities 2015

(Data is preliminary)

June

	Chinook		*Coho*		*Chum*	*Pink*	*Steelhead*								
	0+	*1+*	*0+*	*1+*	*0+*	*0+*	*Unm Smolts*	*Mark Smolts*	*Resident Rainbow*	*Cut./Rain. Trout Fry/Parr*	*Total Salmonid Catch*	*Lamp*	*Sunfish*	*Sculpin spp.*	*Stickle-back*
Day		(15.0 hours of effort)													
Catch	0	1	0	0	0	0	0	0	0	0	1	0	0	0	2
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Night		(31.4 hours of effort)													
Catch	0	1	0	2	0	0	0	0	0	0	3	11	0	0	8
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Totals	(46.4 hours of effort)														
Catch	0	2	0	2	0	0	0	0	0	0	4	11	0	0	10
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Totals (1017.0 total hours of effort)

	Chinook		*Coho*		*Chum*	*Pink*	*Steelhead*								
	0+	*1+*	*0+*	*1+*	*0+*	*0+*	*Unm Smolts*	*Mark Smolts*	*Resident Rainbow*	*Cut./Rain. Trout Fry/Parr*	*Total Salmonid Catch*	*Lamp*	*Sunfish*	*Sculpin spp.*	*Stickle-Back*
Catch	82	13	2146	678	295	0	9	0	0	0	3236	243	9	30	267
Morts.	1	0	0	1	0	0	0	0	0	0	2	0	0	0	0
Mortality Rate	1.22%	0.00%	0.00%	0.15%	0.00%		0.00%				0.06%				
% of Total Catch	2.2%	0.3%	56.5%	17.8%	7.8%	0.0%	0.2%	0.0%	0.0%	0.0%	85.1%	6.4%	0.2%	0.8%	7.0%