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Tulalip Tribes Natural Resources Department Report

SNOQUALMIE RIVER JUVENILE SALMON OUT-MIGRATION STUDY PROGRESS REPORT

February – June 2017

by
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2017

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i. Acknowledgements
The 2017 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), Pacific Salmon Commission (PSC), King County Snoqualmie Forum, 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 1st installation of the rotary screwtrap began and full trapping operations commenced on February 8th. The season ended on June 14th. The trap was fished for approximately 1155 hours over 91 days within a 20 week period. 653 of those hours were fished at night representing 57% of total trapping effort. A total of 13 scheduled sampling events were ultimately cancelled due to unfavorable sampling conditions (i.e. high debris and discharge levels). During the sampling season 4,904 salmon and trout were captured, counted and released. Of that number, 1,421 were sub-yearling Coho salmon fry accounting for 29% of the total catch. Captured unmarked Chinook included 1,200 sub-yearlings and 356 yearlings. The number of Chinook sub-yearlings caught at the Snoqualmie River trap has varied widely from year to year, with the catch in 2017 being the highest documented in project history; nearly three times the project average (2001-2017 average; 419). Captured unmarked Coho included 925 yearlings and 1,421 sub-yearlings. The number of unmarked Coho yearlings caught is 21% lower than the project average (2001-2017 average: 1,158) (Table 1). During the trapping and handling process a total of 8 salmonid mortalities were reported. Mortality as a percentage of the total salmonid catch was approximately 0.163% considerably below project averages and permitted expectations (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
2016	1112	44	809	0.04	0.73
2017	1155.4	1200	925	1.04	0.80
Project Average		*419*	*1158*	0.52	1.47

Table 1. Annual sampling effort and catch totals for sub-yearling Chinook and yearling Coho at the Snoqualmie River Rotary screwtrap 2001-2017 (preliminary data).

A total of 7 trap efficiency tests (all 7 with Chinook sub-yearlings) were conducted on 7 different days throughout the 2017 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 until the maximum allowable number of Chinook available from the hatchery had been reached unless the river was deemed unfishable due to flow conditions. 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 0.57% for Chinook sub-yearlings during the 2017 sampling season (Table 2). The 2017 sub-yearling Chinook efficiency was considerably lower than documented seasonal averages for this trapping location (2001-2016 average: 1.23%, Table 3), During the 2017 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 very low Coho adult escarpments to Wallace Hatchery in 2015, sufficient numbers of 1+ Coho were not available for use by Tulalip in our efficiency releases. Due to this fish shortage, no efficiency trials were conducted using 1+ Yearling Coho in 2017 at the Skykomish trap site. This is the first time in project history that hatchery Coho were not readily available to conduct efficiency releases. This is a direct reflection of critically low Coho escapement numbers to the Snohomish Basin in brood year 2015.

Year	River	Release Date	0+ CK Eff	1+ CO Eff
2017	Snoqualmie	3/21/2017	***0.20%***	
2017	Snoqualmie	4/4/2017	***0.45%***	
2017	Snoqualmie	4/12/2017	***0.60%***	
2017	Snoqualmie	4/19/2017	***0.60%***	
2017	Snoqualmie	4/26/2017	***0.75%***	
2017	Snoqualmie	5/2/2017	***0.75%***	
2017	Snoqualmie	5/10/2017	***0.65%***	
		2016 Avg. Total	0.57%	N/A

Table 2. Efficiency release dates and re-capture (efficiency) percentages at the Snoqualmie trap site; 2017.

Release Date	Total Number of Releases	Total Release (R)	Total Recovered (r)	% Recovered
2004	4	5175	75	1.45%
2005	5	5900	99	1.68%
2006	3	3091	45	1.46%
2007	2	2579	33	1.28%
2009	3	3176	60	1.89%
2010	4	4287	60	1.40%
2011	2	2347	30	1.28%
2012	4	7987	200	2.50%
2013	5	9993	58	0.58%
2014	5	10138	71	0.70%
2015	7	13988	196	1.40%
2016	7	14,007	184	1.31%
2017	7	13952	80	0.57%
All Project Total	58	96620	1191	1.23%

Table 2. Sub-yearling Chinook release summary and recapture efficiency percentages by year, 2004-2017

After a preliminary review of the data catch per unit effort (CPUE) for unmarked Chinook sub-yearlings showed two distinct peak periods in 2017. The timing of the sub-yearling Chinook outmigration has varied from year to year, and does not exhibit the observed consistency documented for yearling Coho in the Snoqualmie. In 2017, sub-yearling Chinook catch increased slowly and steadily until it initially peaked around SW 17 when approximately 2 fish per hour were encountered before dropping off quickly again to below 0.5 fish per hour by SW 18. Surprisingly, a secondary peak started building by SW 19 and the second highest Chinook CPUE ever recorded for the Snoqualmie site occurred in SW 21 when approximately 3.5 fish per hour were encountered. Sub-yearling Chinook catches persisted through the remainder of the season. The Coho yearling outmigration peak also demonstrated a bi-modal pattern with the first peak occurring in SW 17 or SW 18 when approximately 3 fish per hour were captured, and the second higher peak occurring in SW 20 when approximately 4.75 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.

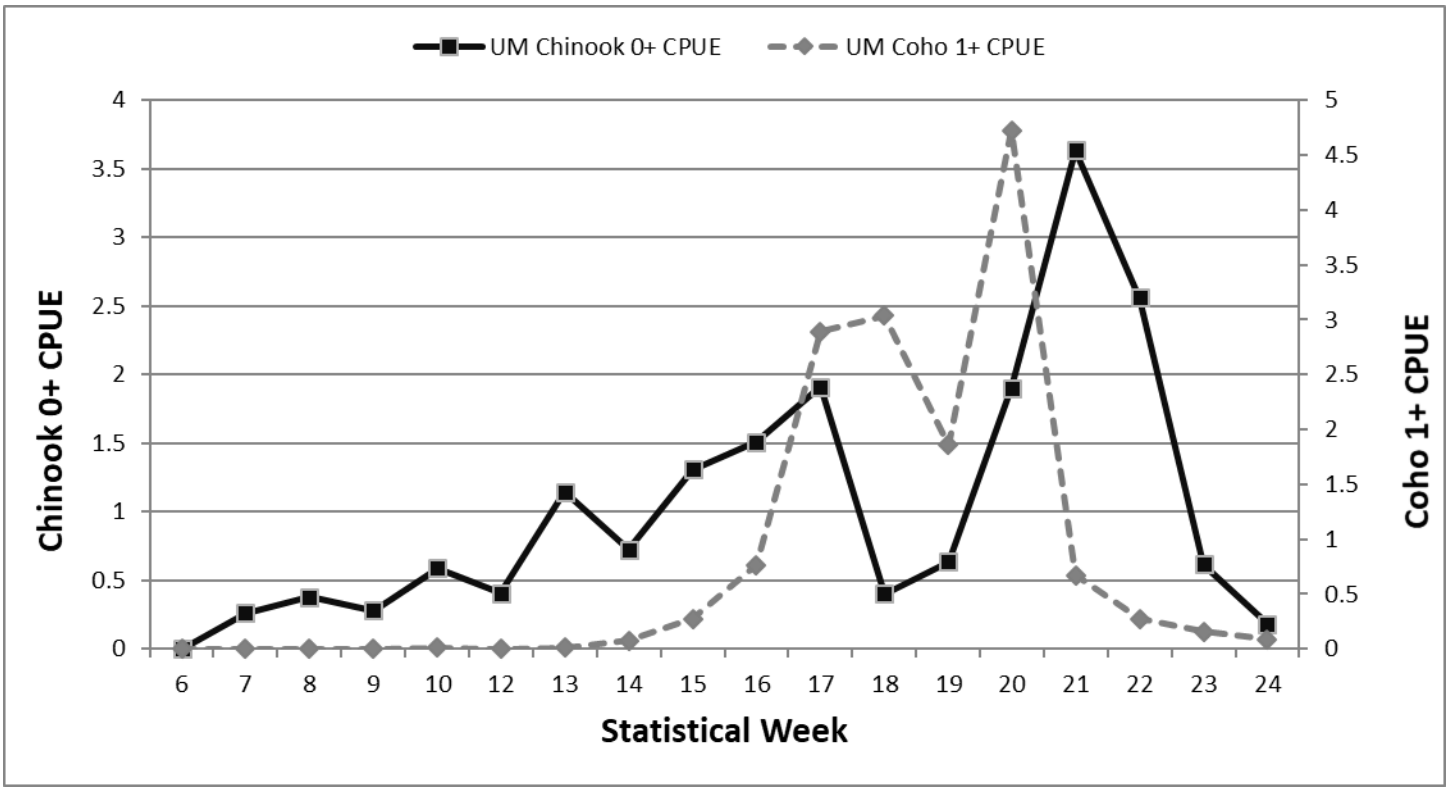


Figure 2. Chinook sub-yearling (age 0+) and coho yearling (age 1+) migration patterns observed during 2017 at the Snoqualmie River trap, river mile 12.2 (preliminary data).

2017 Trap Sampling Season				
Year	StatWeek	BegWeek	MidWeek	EndWeek
2017	5	1/29/2017	2/1/2017	2/4/2017
2017	6	2/5/2017	2/8/2017	2/11/2017
2017	7	2/12/2017	2/15/2017	2/18/2017
2017	8	2/19/2017	2/22/2017	2/25/2017
2017	9	2/26/2017	3/1/2017	3/4/2017
2017	10	3/5/2017	3/8/2017	3/11/2017
2017	11	3/12/2017	3/15/2017	3/18/2017
2017	12	3/19/2017	3/22/2017	3/25/2017
2017	13	3/26/2017	3/29/2017	4/1/2017
2017	14	4/2/2017	4/5/2017	4/8/2017
2017	15	4/9/2017	4/12/2017	4/15/2017
2017	16	4/16/2017	4/19/2017	4/22/2017
2017	17	4/23/2017	4/26/2017	4/29/2017
2017	18	4/30/2017	5/3/2017	5/6/2017
2017	19	5/7/2017	5/10/2017	5/13/2017
2017	20	5/14/2017	5/17/2017	5/20/2017
2017	21	5/21/2017	5/24/2017	5/27/2017
2017	22	5/28/2017	5/31/2017	6/3/2017
2017	23	6/4/2017	6/7/2017	6/10/2017
2017	24	6/11/2017	6/14/2017	6/17/2017
2017	25	6/18/2017	6/21/2017	6/24/2017

Table 3. Statistical weeks and corresponding dates for 2017 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 2017 indicate an above average incidence of encounter for sub-yearling Chinook and a below average incidence of encounter for yearling Coho (Table 1, Figure 3).

The overall CPUE for sub-yearling Chinook in the Snoqualmie River was alarmingly low in both 2015 and 2016 at approximately .08 and .04 fish per hour of effort, respectively, representing the lowest annual encounter rates in project history (2001-2016). The 2017 CPUE, however, is nearly twice as high as the project average for sub-yearling Chinook (Project average; 0.55 fish per hour) and represents the second highest catch rate in project history since 2001. The total number of sub-yearling Chinook in 2017 was the highest number of individuals ever encountered in one sampling season dating back to 2001. Chinook efficiency rates in 2017 were also considerably lower than project averages, and it is likely that had these efficiency rates been higher 2017 sub-yearling Chinook catches may well have broken all time project record-highs. This above average incidence of encounter for sub-yearling Chinook likely directly corresponds to a very strong outmigrant sub-yearling Chinook cohort from the Snoqualmie basin in 2017.

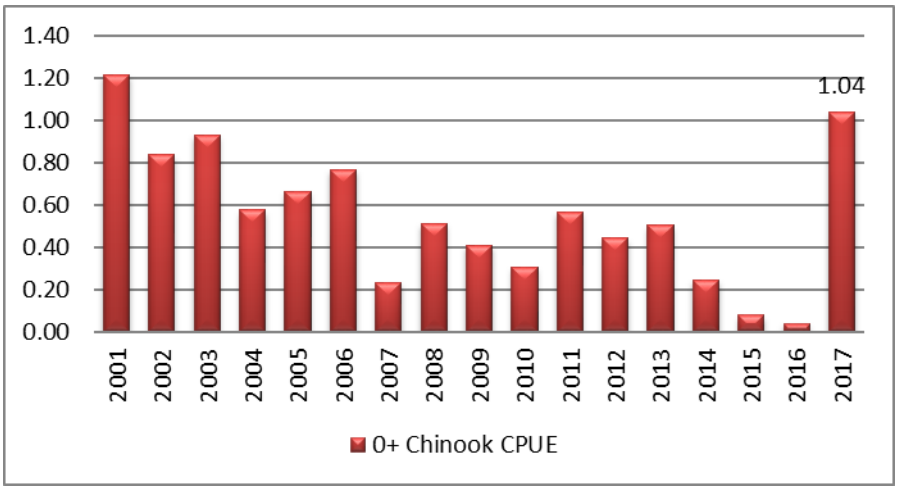


Figure 3. Sub-yearling Chinook average CPUE at the Snoqualmie trap; 2001-2017.

Yearling Coho catch rates have in general remained fairly consistent throughout the project duration with some observed seasonal variability dependent upon river conditions and the size of a given years outmigrant cohort (Figure 4). In 2017 the average yearling Coho CPUE was approximately 50% lower than documented averages at .80 yearling Coho per hour sampled (Project average; 1.52 fish per hour). Yearling Coho catches in 2017 were the third lowest recorded in project history (2001-2017). This number is likely due to a combination of lower overall catch efficiency rates and a smaller outmigrant cohort size in 2017. 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 with considerable seasonal variability (Figure 4).

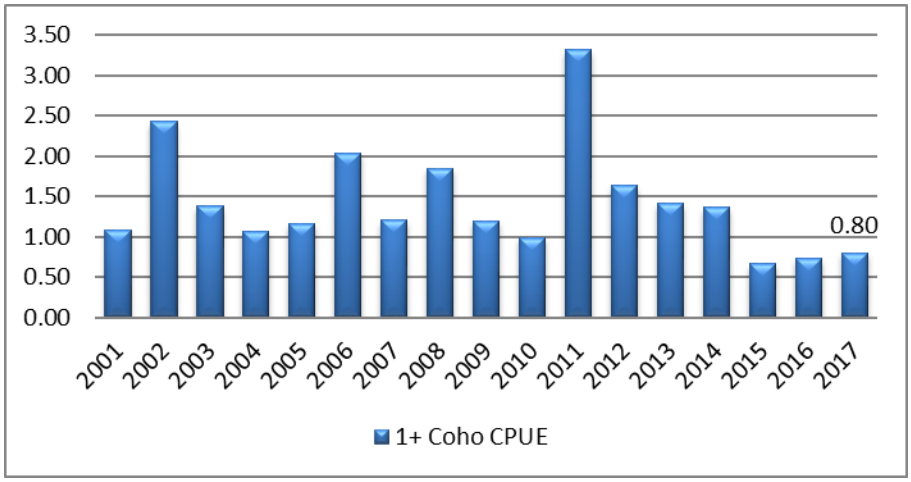


Figure 4. Yearling Coho average CPUE at the Snoqualmie trap; 2001-2017.

3.1 Additional Studies

Genetic Mark Recapture Parentage Assignment - WDFW

Beginning in 2012 under a funded cooperative management agreement with WDFW, TTT began assisting in a basin-wide 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 2017 monitoring season 1,512 upper-caudal DNA samples were taken from a mix of sub-yearling and yearling unmarked Chinook juveniles. This number accounts for the highest number of Chinook DNA samples taken to date at the Snoqualmie trap, and is significantly higher than previous years dating back to 2012.

In 2017, 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 2017, 1,512 upper-caudal DNA samples were taken from a mix of sub-yearling and yearling unmarked Chinook juveniles. This number is considerable higher than project averages dating back to beginning of the GMR study at the Snoqualmie in 2012 and is the highest recorded incidence of Chinook encounters at the Snoqualmie site to date (Table 4).

Snoqualmie River	
Year	**Chinook Samples Taken**
2012	376
2013	844
2014	305
2015	90
2016	52
2017	1,512
Total to Date	3,179

Table 4. GMR Sample Totals 2012-2016

4. Project status and difficulties.

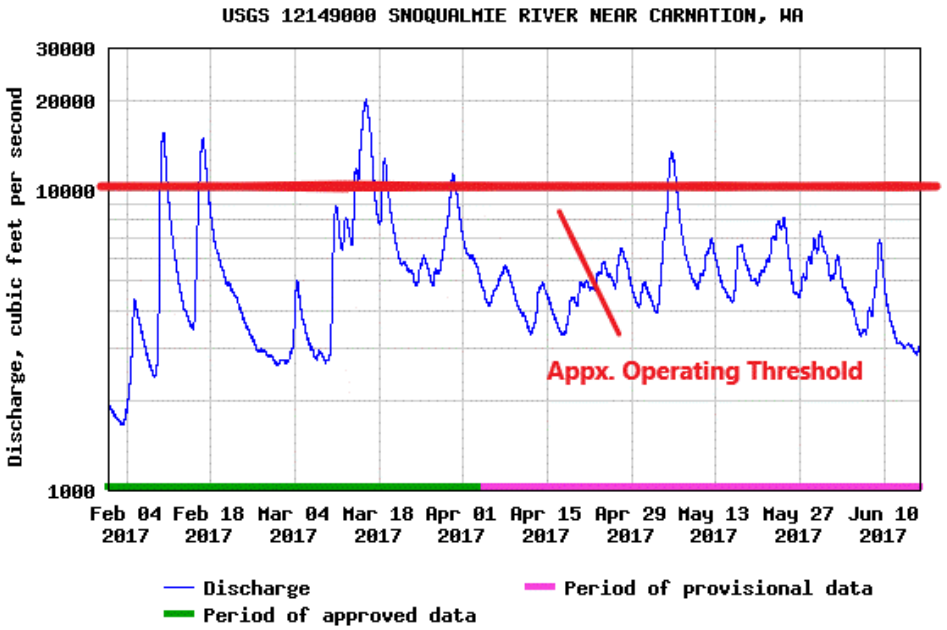
In terms of trap operation the 2017 trapping season went generally well. Total trapping effort (approximately 1100 hours) and sample scheduling were moderately impacted by variability in weather conditions and hydrology with a higher than average number of scheduled shifts being cancelled or rescheduled due to inclement weather. Efficiency percentages in general have suffered at the Snoqualmie site in recent years, and the key driving factor(s) behind this decrease is yet unknown.

In total 13 scheduled sampling events were ultimately canceled or abandoned during the 2017 season due primarily to heavy debris loads caused by unfavorable hydrologic conditions. These 12 cancellations account for approximately 145 hours of effort that was potentially missed due to poor river conditions. As a function of total trapping effort these 145 hours represent approximately 13% of the total 1100 hours that the Snoqualmie trap was fished effectively in 2017. On March 13th, heavy rainfall resulted in river levels rapidly rising to and exceeding safety thresholds at the Snoqualmie site resulting in 7 total shifts being cancelled during SW 11. Due to this hydrologic event, no sampling effort occurred during the entirety of SW 11. Fishing recommenced during SW 12 on Monday, March 20th, and SW 12 was fished as scheduled without incident. During SW 13 the rivers again surpassed the sampling threshold, and 3 shifts were cancelled from March 29th – 30th. Fishing recommenced on Friday, March 31st. The river again rose to unfishable levels during SW 18, and trapping was cancelled for just 1 shift on Thursday, May 4th recommencing the following Monday, May 8th. From May 8th to June 14th the trap was fished as scheduled without incident.

Despite the hydrological difficulties in 2017 the catch numbers, particularly for Chinook salmon, where remarkably good. It is likely that an unknown proportion of outmigrating salmonids were missed due to sampling cancellations. It is likely that stable late-fall/early-winter hydrology in 2016/17 coupled with low temperatures and record breaking mountain snowpack directly resulted in

overall favorable rearing conditions for salmon in 2017 resulting in a significantly improved egg to fry survival for most outmigrant cohorts, particularly sub-yearling Chinook which were encountered at an unprecedented rate in 2017 at the Snoqualmie trap site.

Aside from the aforementioned scheduling difficulties, 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 2017 season with no down-time associated directly with equipment failure.



Hydrograph imagery provided by U.S. Geological Survey. http://nwis.waterdata.usgs.gov

5. References

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The Tulalip Tribes, Cultural & Natural Resources Department
October, 2017

Table 1: Snoqualmie River trap catch and mortalities 2017

(Data is preliminary)

February

	Chinook		Coho		Chum	Pink	Steelhead		Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts							
Day	(23.9 hours of effort)														
Catch	1	0	0	0	3	0	0	0	0	0	4	20	0	0	1
Morts.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
Night	(63.6 hours of effort)														
Catch	47	0	4	0	5	0	0	1	1	0	58	155	0	1	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Totals	(87.5 hours of effort)														
Catch	48	0	4	0	8	0	0	1	1	0	62	175	0	1	1
Morts.	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0

March

	Chinook		Coho		Chum	Pink	Steelhead		Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts							
Day	(95.3 hours of effort)														
Catch	39	0	7	0	98	0	1	0	0	0	145	2	0	1	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Night	(146.6 hours of effort)														
Catch	128	0	101	2	159	0	0	0	0	0	391	78	2	0	1
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Monthly Totals	(241.9 hours of effort)														
Catch	167	0	108	2	257	0	1	0	0	0	536	80	2	1	1
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

Table 1: Snoqualmie River trap catch and mortalities 2017

(Data is preliminary)

April

	Chinook		Coho		Chum	Pink	Steelhead		Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts							
Day	(119.0 hours of effort)														
Catch	66	2	38	28	155	0	2	2	0	0	294	5	0	0	0
Morts.	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Night	(189.9 hours of effort)														
Catch	319	1	264	248	312	0	3	13	0	0	1164	128	1	0	4
Morts.	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Monthly Totals	(308.9 hours of effort)														
Catch	385	3	302	276	467	0	5	15	0	0	1458	133	1	0	4
Morts.	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0

May

	Chinook		Coho		Chum	Pink	Steelhead		Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts							
Day	(164.3 hours of effort)														
Catch	281	196	101	177	28	0	146	0	0	0	930	16	1	0	16
Morts.	2	0	0	1	0	0	0	0	0	0	3	0	0	0	0
Night	(171.8 hours of effort)														
Catch	245	110	703	454	21	0	20	20	0	0	1576	150	17	2	29
Morts.	1	0	1	0	0	0	0	0	0	0	2	0	0	0	0
Monthly Totals	(336.0 hours of effort)														
Catch	526	306	804	631	49	0	166	20	0	0	2506	166	18	2	45
Morts.	3	0	1	1	0	0	0	0	0	0	5	0	0	0	0

Table 1: Snoqualmie River trap catch and mortalities 2017

(Data is preliminary)

June

	Chinook		Coho		Chum	Pink	Steelhead		Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts							
Day	(100.3 hours of effort)														
Catch	25	17	26	3	0	0	0	0	0	0	71	12	0	0	6
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Night	(80.8 hours of effort)														
Catch	49	30	177	13	0	0	1	0	0	0	271	249	4	0	8
Morts.	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
Monthly Totals	(181.0 hours of effort)														
Catch	74	47	203	16	0	0	1	0	0	0	342	261	4	0	14
Morts.	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0

Totals (1155.4 total hours of effort)

	Chinook		Coho		Chum	Pink	Steelhead		Resident Rainbow	Cut./Rain. Trout Fry/Parr	Total Salmonid Catch	Lamp	Sunfish	Sculpin spp.	Stickle-back
	0+	1+	0+	1+	0+	0+	Unm Smolts	Mark Smolts							
Catch	1200	356	1421	925	781	0	173	36	1	0	4904	815	25	4	65
Morts.	6	0	1	1	0	0	0	0	0	0	8	1	1	0	0
Mortality Rate	0.50%	0.00%	0.07%	0.11%	0.00%	0	0.00%	0.00%	0.00%	0	0.16%				
% of Total Catch	20.6%	6.1%	24.3%	15.8%	13.4%	0.0%	3.0%	0.6%	0.0%	0.0%	84.0%	14.0%	0.4%	0.1%	1.1%