

Tulalip Tribes Natural Resources Department Report

SNOQUALMIE RIVER JUVENILE SALMON OUT-MIGRATION STUDY PROGRESS REPORT

February – June 2018

by
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2018



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i. Acknowledgements

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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 12th installation of the rotary screwtrap began and full trapping operations commenced on February 21st. The season ended on June 15th. The trap was fished for approximately 1117 hours over 85 business days within a 17 week period from Statistical Week 8 – Statistical Week 24. 445 of those hours were fished at night representing 40% of total trapping effort. A total of 6 scheduled sampling events were ultimately cancelled due to unfavorable sampling conditions (i.e. high debris and discharge levels). During the sampling season 11,274 salmon and trout were captured, counted and released. Of that number, 7,374 were sub-yearling Pink salmon fry accounting for 65% of the total catch. Captured unmarked Chinook included 1,508 sub-yearlings and 97 yearlings. The number of Chinook sub-yearlings caught at the Snoqualmie River trap has varied widely from year to year, with the catch in 2018 being the highest documented in project history; over three times the project average (2001-2018 average; 523). Captured unmarked Coho included 1,517 yearlings and 521 sub-yearlings. The number of unmarked Coho yearlings caught is 23% higher than the project average (2001-2017 average: 1,165) (Table 1). During the trapping and handling process a total of 20 salmonid mortalities were reported. Mortality as a percentage of the total salmonid catch was approximately 0.18% 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
2018	1116.8	1508	1517	1.35	1.36
<i>Project Average</i>	<i>871</i>	<i>523</i>	<i>1165</i>	<i>0.60</i>	<i>1.43</i>

Table 1. Annual sampling effort and catch totals for sub-yearling Chinook and yearling Coho at the Snoqualmie River Rotary screwtrap 2001-2018 (preliminary data).

A total of 12 trap efficiency tests (7 with Chinook sub-yearlings, 5 with Coho yearlings) were conducted on 12 different days throughout the 2018 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 and Coho available from the hatchery had been reached unless the river was deemed unfishable due to flow conditions or other environmental factors. 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 1.07% for Chinook sub-yearlings during the 2017 sampling season (Table 2). The 2018 sub-yearling Chinook efficiency was slightly lower than documented seasonal averages for this trapping location (2001-2018 average: 1.21%). Efficiency trials with yearling Coho indicate an efficiency of approximately 0.60%. This is also slightly below the project efficiency average for yearling Coho at the Snoqualmie (2002-2018 average 0.67%). During the 2018 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.

Year	River	Release Date	0+ CK Eff	1+ CO Eff
2018	Snoqualmie	3/6/2018	1.65%	
2018	Snoqualmie	3/14/2018	0.50%	
2018	Snoqualmie	3/20/2018	1.71%	
2018	Snoqualmie	3/28/2018	0.60%	
2018	Snoqualmie	4/3/2018	1.75%	
2018	Snoqualmie	4/10/2018	0.80%	
2018	Snoqualmie	4/18/2018	0.45%	
2018	Snoqualmie	5/1/2018		2.23%
2018	Snoqualmie	5/23/2018		0.20%
2018	Snoqualmie	5/29/2018		0.00%
2018	Snoqualmie	6/7/2018		0.40%
2018	Snoqualmie	6/12/2018		0.15%
		2016 Avg. Total	1.07%	0.60%

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

After a preliminary review of the data catch per unit effort (CPUE) for unmarked Chinook sub-yearlings showed one distinct peak in 2018 with the possibility of at least two but up as many as four, smaller peaks. 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 2018, sub-yearling Chinook catch increased steadily until it initially peaked around SW 11 when approximately 2 fish per hour were encountered before dropping off quickly again to below 0.5 fish per hour by SW 12. Surprisingly, a secondary and much larger peak was observed in SW 13 when over 4 fish per hour were encountered. Following this peak, sub-yearling Chinook catches began to ultimately decline while at the same time displaying a series of various smaller peaks before eventually completely dropping off in SW 21. The Coho yearling outmigration showed one very clear peak during SW 18-19 when approximately 7-8 fish per hour were encountered (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.

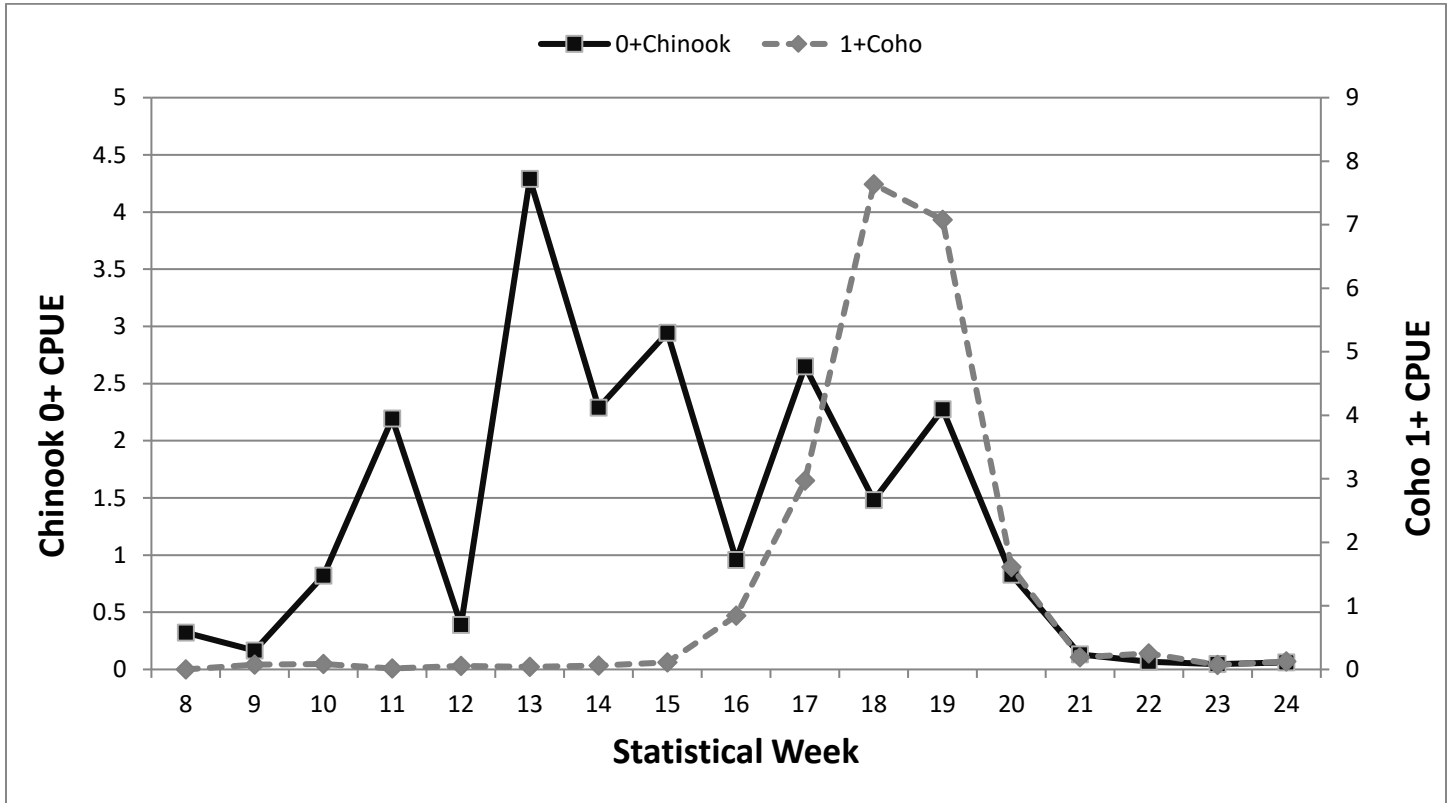


Figure 2. Chinook sub-yearling (age 0+) and coho yearling (age 1+) migration patterns observed during 2018 at the Snoqualmie River trap, river mile 12.2 (preliminary data).

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 2018 indicate an above average incidence of encounter for sub-yearling Chinook and a slightly 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 (2001-2018). The 2017 and 2018 CPUE, however are significantly above project averages for sub-yearling Chinook (Project average; 0.55 fish per hour). 2017 sub-yearling Chinook catch rates were the second highest ever documented at the Snoqualmie trap site, and 2018's catch rates set an all-time project record high. The total number of sub-yearling Chinook in 2018 was the highest number of individuals ever encountered in one sampling season dating back to 2001. This above average incidence of encounter for sub-yearling Chinook likely directly corresponds to a very strong sub-yearling Chinook emigration from the Snoqualmie basin in 2017 and 2018.

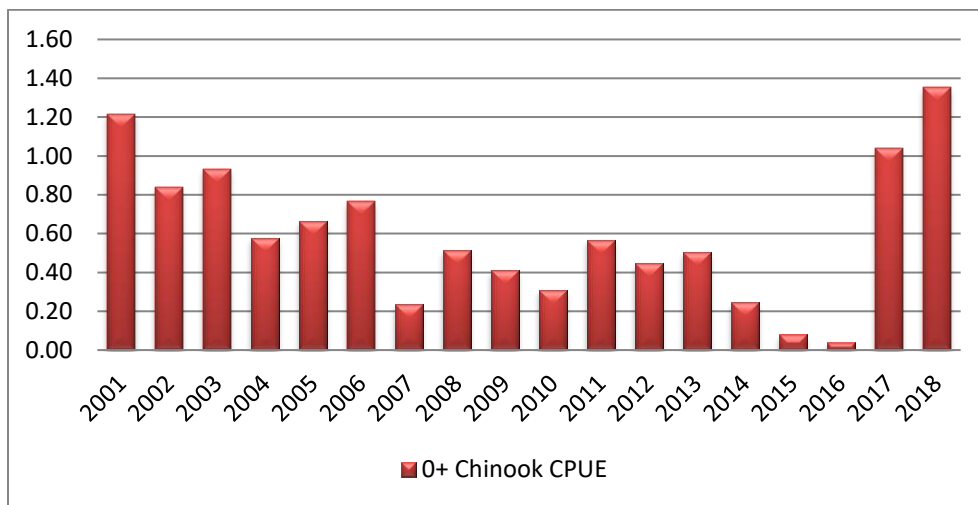


Figure 3. Sub-yearling Chinook average CPUE at the Snoqualmie trap; 2001-2017.

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 2018 the average yearling Coho CPUE was slightly lower, but very close to documented averages at 1.36 yearling Coho per hour sampled (Project average; 1.43 fish per hour). The total number of yearling Coho encountered was slightly above project averages to date at 1,517 individuals encountered (Project average; 1,165). 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 depending primarily upon environmental factors and the size of a given years emigrating class (Figure 4).

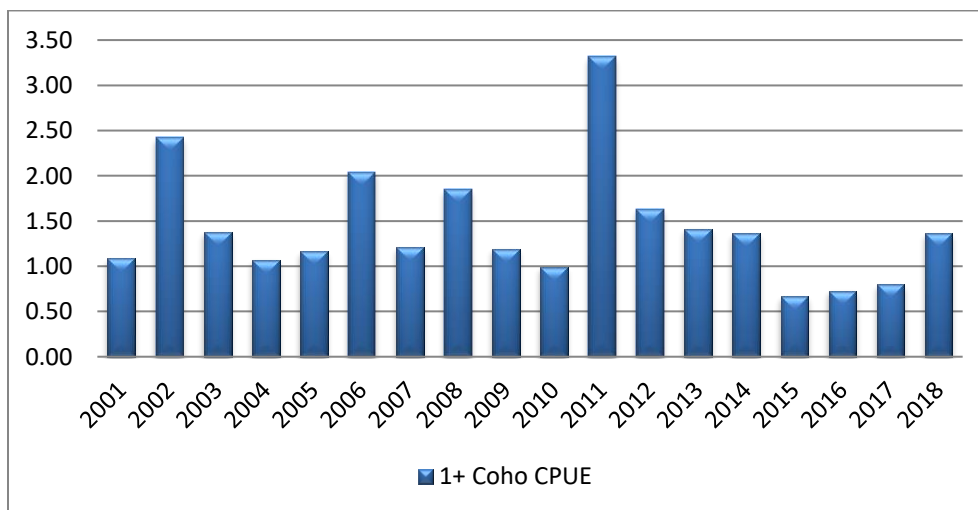


Figure 4. Yearling Coho average CPUE at the Snoqualmie trap; 2001-2017.

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 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 2018 monitoring season 1,481 upper-caudal DNA samples were taken from a mix of sub-yearling and yearling unmarked Chinook juveniles. This number accounts for the second 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 2018, 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 forklength 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 2018, 1,481 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 over 4,600 DNA samples have been collected from emigrating Chinook salmon sub-yearling and yearling smolts at the Snoqualmie trap site (Table 4).

Snoqualmie River	
Year	Chinook Samples Taken
2012	376
2013	844
2014	305
2015	90
2016	52
2017	1,512
2018	1,481
Total to Date	4,660

Table 4. GMR Sample Totals 2012-2018

4. Project status and difficulties.

In terms of trap operation the 2018 trapping season went generally well. Total trapping effort (approximately 1117 hours) and sample scheduling were moderately impacted by variability in weather conditions and hydrology with a generally 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, with the exception of 2018 being a fairly average year for trap efficiencies for both sub-yearling Chinook and yearling Coho.

In total 6 scheduled sampling events were ultimately canceled or abandoned during the 2018 season due primarily to heavy debris loads caused by unfavorable hydrologic conditions, as well as road flooding that limited access to the site at times. These 6 cancellations account for approximately 72 hours of effort that was potentially missed due to poor river conditions. As a function of total trapping effort these 72 hours represent approximately 6.5% of the total 1117 hours that the Snoqualmie trap was fished effectively in 2018. On Monday, April 9th heavy rainfall resulted in river levels rapidly rising at the Snoqualmie site resulting in the road becoming flooded and causing the cancellation of 2 shifts during SW 15. Fishing recommenced later the same week on Tuesday, April 10th. Again, during SW 16 heavy rain pushed the rivers beyond sampling thresholds and 3 shifts were cancelled from April 16th – 18th. Fishing recommenced on Thursday, April 19th. Following these missed dates in SW 16 only 1 other shift was ultimately cancelled at the Snoqualmie site during SW 19 on Wednesday, May 9th. From SW 19 forward the trap fished as scheduled without incident. These scheduling changes were sporadic and infrequent, and fortunately no full sampling weeks were missed during the 2018 season which provides at least some statistical insight into every Statistical week during project operation from SW 8-24.

Despite the hydrological difficulties in 2018 the catch numbers, particularly for Chinook salmon, were remarkably good. It is likely that an unknown proportion of outmigrating salmonids were missed due to sampling cancellations, although the total number of missed fish is not likely highly significant. It is likely that stable late-fall/early-winter hydrology in 2018 coupled with low temperatures and record breaking mountain snowpack directly resulted in overall favorable rearing conditions for salmon in 2018 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 2018 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.

2018 Trap Sampling Season				
Year	StatWeek	BegWeek	MidWeek	EndWeek
2018	8	2/18/2018	2/21/2018	2/24/2018
2018	9	2/25/2018	2/28/2018	3/3/2018
2018	10	3/4/2018	3/7/2018	3/10/2018
2018	11	3/11/2018	3/14/2018	3/17/2018
2018	12	3/18/2018	3/21/2018	3/24/2018
2018	13	3/25/2018	3/28/2018	3/31/2018
2018	14	4/1/2018	4/4/2018	4/7/2018
2018	15	4/8/2018	4/11/2018	4/14/2018
2018	16	4/15/2018	4/18/2018	4/21/2018
2018	17	4/22/2018	4/25/2018	4/28/2018
2018	18	4/29/2018	5/2/2018	5/5/2018
2018	19	5/6/2018	5/9/2018	5/12/2018
2018	20	5/13/2018	5/16/2018	5/19/2018
2018	21	5/20/2018	5/23/2018	5/26/2018
2018	22	5/27/2018	5/30/2018	6/2/2018
2018	23	6/3/2018	6/6/2018	6/9/2018
2018	24	6/10/2018	6/13/2018	6/16/2018

Table 3. Statistical weeks and corresponding dates for 2017 sampling season.

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Table 1: Snoqualmie River trap catch and mortalities 2018

(Data is preliminary)

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</i>		<i>Resident Rainbow</i>	<i>Cut./Rain. Trout Fry/Parr</i>	<i>Total Salmonid Catch</i>	<i>Lamp</i>	<i>Sunfish</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>0+</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>							
<i>Day</i>	(19.9 hours of effort)														
Catch	5	0	0	0	0	13	0	0	0	0	18	0	0	0	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Night</i>	(50.0 hours of effort)														
Catch	8	0	0	6	10	53	0	0	0	0	77	65	0	1	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Totals	(69.8 hours of effort)														
Catch	13	0	0	6	10	66	0	0	0	0	95	65	0	1	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</i>		<i>Resident Rainbow</i>	<i>Cut./Rain. Trout Fry/Parr</i>	<i>Total Salmonid Catch</i>	<i>Lamp</i>	<i>Sunfish</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>0+</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>							
<i>Day</i>	(89.6 hours of effort)														
Catch	86	0	2	0	31	651	0	0	0	0	770	2	0	0	0
Morts.	0	0	0	0	0	2	0	0	0	0	2	0	0	0	0
<i>Night</i>	(211.2 hours of effort)														
Catch	488	1	69	12	44	3356	1	0	0	2	3973	149	0	1	1
Morts.	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
Monthly Totals	(300.8 hours of effort)														
Catch	574	1	71	12	75	4007	1	0	0	2	4743	151	0	1	1
Morts.	2	0	0	0	0	2	0	0	0	0	4	0	0	0	0

Table 1: Snoqualmie River trap catch and mortalities 2018

(Data is preliminary)

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</i>		<i>Resident Rainbow</i>	<i>Cut./Rain. Trout Fry/Parr</i>	<i>Total Salmonid Catch</i>	<i>Lamp</i>	<i>Sunfish</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>0+</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>							
<i>Day</i>	(80.5 hours of effort)														
Catch	26	12	3	4	21	980	0	0	0	0	1046	2	1	0	2
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Night</i>	(157.1 hours of effort)														
Catch	554	10	278	382	78	2294	2	13	0	1	3617	142	25	3	10
Morts.	9	0	2	0	1	0	0	0	0	0	12	0	0	0	0
Monthly Totals	(237.6 hours of effort)														
Catch	580	22	281	386	99	3274	2	13	0	1	4663	144	26	3	12
Morts.	9	0	2	0	1	0	0	0	0	0	12	0	0	0	0

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</i>		<i>Resident Rainbow</i>	<i>Cut./Rain. Trout Fry/Parr</i>	<i>Total Salmonid Catch</i>	<i>Lamp</i>	<i>Sunfish</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>0+</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>							
<i>Day</i>	(211.3 hours of effort)														
Catch	103	13	12	156	1	13	1	0	0	0	300	6	5	0	2
Morts.	1	0	0	0	0	0	0	0	0	0	1	0	0	0	0
<i>Night</i>	(190.1 hours of effort)														
Catch	232	22	149	946	2	14	23	4	0	0	1405	192	7	0	5
Morts.	2	0	0	1	0	0	0	0	0	0	3	0	0	0	0
Monthly Totals	(401.3 hours of effort)														
Catch	335	35	161	1102	3	27	24	4	0	0	1705	198	12	0	7
Morts.	3	0	0	1	0	0	0	0	0	0	4	0	0	0	0

Table 1: Snoqualmie River trap catch and mortalities 2018

(Data is preliminary)

June															
	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</i>		<i>Resident Rainbow</i>	<i>Cut./Rain. Trout Fry/Parr</i>	<i>Total Salmonid Catch</i>	<i>Lamp</i>	<i>Sunfish</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>0+</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>							
<i>Day</i>	(44.0 hours of effort)														
Catch	1	3	0	0	0	0	0	0	0	0	4	5	1	0	0
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Night</i>	(63.3 hours of effort)														
Catch	5	36	8	11	0	0	1	1	0	0	64	235	7	3	2
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Monthly Totals	(107.3 hours of effort)														
Catch	6	39	8	11	0	0	1	1	0	0	68	240	8	3	2
Morts.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Totals															
	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</i>		<i>Resident Rainbow</i>	<i>Cut./Rain. Trout Fry/Parr</i>	<i>Total Salmonid Catch</i>	<i>Lamp</i>	<i>Sunfish</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>1+</i>	<i>0+</i>	<i>0+</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>							
Catch	1508	97	521	1517	187	7374	28	18	0	3	11274	798	46	8	22
Morts.	14	0	2	1	1	2	0	0	0	0	20	0	0	0	0
Mortality Rate	0.93%	0.00%	0.38%	0.07%	0.53%	0.03%	0.00%	0.00%	#Num!	0.00%	0.18%				
% of Total Catch	12.4%	0.8%	4.3%	12.5%	1.5%	60.6%	0.2%	0.1%	0.0%	0.0%	92.6%	6.6%	0.4%	0.1%	0.2%