

## SNOQUALMIE RIVER JUVENILE SALMON OUT-MIGRATION STUDY PROGRESS REPORT Februaury – June 2012

### 1. Summary of activities completed during the sampling season.

On February 8<sup>th</sup> installation of the rotary screwtrap began and fishing started on February 15<sup>th</sup>. The season ended on June 15<sup>th</sup> completing 17 weeks of fishing in which 847.2 hours were fished over 75 days. The fishing effort consisted of 464.0 hours of night fishing making up 54.8% of the sampling hours. There were 14 scheduled fishing events that were unfishable during this five month period due to poor river conditions (i.e. high debris and discharge levels). During the sampling season 21,810 salmon and trout were captured, counted and released. Of the total number of salmon and trout captured, 377 were unmarked (wild) Chinook sub-yearlings, 21 were unmarked Chinook yearlings and 1384 were unmarked (wild) coho yearling (Table 2). The Chinook catch numbers are approximately the same average as the past few years recorded for the trapping project while the Coho catch is less than last years catch but more than years prior.

During the trapping and handling process a total of 195 salmonid mortalities were reported of which 7 was Chinook sub-yearlings. Mortality rates were calculated for all salmonid species captured (Table 1). Mortality as a percentage of the total salmonid catch (0.89%) was lower than the last years but above the average for the project. This is most likely due to a high number of mortalities caused by high debris and high flows during pre-flooding fishing events.

Table 1 shows a monthly breakdown of catch numbers for all species, and Table 3 shows statistical weeks (SW) and the corresponding dates for the 2012 sampling season. After a preliminary review of the data it appears that catch per unit effort (CPUE) for wild Chinook sub-yearlings was highest during SW 21 and 22 when approximately 0.99 and 1.02 fish per hour were caught respectively. The timing of these peaks has varied from year to year, and has not shown the consistency we observe with juvenile coho migration. The highest CPUE for coho yearlings was recorded during SW 19 when almost 8 fish per hour were caught. Lesser peaks were also observed at SW 18 and 21 with a rate of approximately 5.5 fish per hour and almost 5 fish per hour. The timing is consistent with the timing observed in all years of the trapping project.

A total of seven trap efficiency tests (4 Chinook sub-yearlings and 3 coho yearlings) were conducted on seven different days during the sampling season. During these tests, groups of salmon were marked and released over a mile upstream of the trap site. The trap was then operated continuously (except during debris removal) for a minimum of 36 hours. These calculations suggest that the trap was operating at an efficiency rate of 2.50% for Chinook sub-yearlings and 0.60% for coho yearlings during the 2012 sampling period. The Chinook efficiency rates are higher for this year than any other year recorded for the project. This may be due to the change in efficiency protocol this year. Releases occurred in the evenings instead of in the morning or afternoon as in previous years. Also the number of fish released was 2000 instead of 1000. This new protocol did not change the coho rates, however, this number is lower than the last several years.

### 2. Project status and difficulties

The 2012 season for the Snoqualmie River trapping project went well, not including the five instances when the fishing conditions were not ideal due to high river levels or debris levels. On February 21<sup>st</sup> the lines were taken down in anticipation of flooding. The river reached 33,300 cfs and the lines were not put back up again until February 29<sup>th</sup> pushing back training of employees. The second time the lines were taken down was on April 20<sup>th</sup> when a flood was forecasted. The river level increased to 13,000 cfs and remained fairly high for over a week. 7 scheduled fishing events were cancelled during this period and the lines were put back up on April 28<sup>th</sup>. On May 1<sup>st</sup> the river rose to 11,000 cfs and caused high levels of debris cutting short 1 fishing event and causing 2 others to be cancelled. Fishing began again on May 2<sup>nd</sup>. The river levels on May 15<sup>th</sup> were approximately 8,000 cfs which is fishable, however, a 70 foot tree floated down the river and hit the trap while it was fishing. This caused damage to the trap and cut the fishing event short. It took a day to fix the trap and 2 fishing events had to be cancelled during this time. The trap was operating again on May 16<sup>th</sup>. The last disturbance to our sampling effort occurred on May 22<sup>nd</sup> when the river rose to 12,000 cfs and caused considerable debris levels and fishing had to be discontinued. Between May 22<sup>nd</sup> and May 24<sup>th</sup> on shift was fished but 3 others had to be cancelled. Aside from these occurrences, the trapping project on the Snoqualmie River was satisfactory. Due to the number of cancelled fishing events, the sampling hours fished were less than planned even though as many hours as possible were attempted to be recuperated during good fishing conditions.

During the 2012 sampling season, another sampling effort was added to the project. In coordination with Washington State Department of Fish and Wildlife, all wild Chinook caught were sampled for DNA. During the monitoring season approximately 375 DNA clips were taken.

**Table 1: Snoqualmie River trap catch and mortalities 2012**

(Data is preliminary)

**February**

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</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>Resident Rainbow</i>						
<i>Day</i>	( 4.1 hours of effort)														
<b>Catch</b>	0	0	0	0	0	6	0	0	0	0	6	0	0	0	0
<b>Morts.</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Night</i>	( 17.1 hours of effort)														
<b>Catch</b>	1	0	1	0	2	261	0	0	0	0	265	15	0	1	0
<b>Morts.</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<b>Monthly Totals</b>	( 21.2 hours of effort)														
<b>Catch</b>	1	0	1	0	2	267	0	0	0	0	271	15	0	1	0
<b>Morts.</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

**March**

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</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>Resident Rainbow</i>						
<i>Day</i>	(101.7 hours of effort)														
<b>Catch</b>	4	0	1	0	10	1420	0	0	0	0	1435	0	1	0	0
<b>Morts.</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Night</i>	(154.8 hours of effort)														
<b>Catch</b>	32	1	54	8	89	3615	0	0	2	0	3805	65	1	0	4
<b>Morts.</b>	2	0	1	0	1	82	0	0	0	0	86	0	0	0	0
<b>Monthly Totals</b>	(256.5 hours of effort)														
<b>Catch</b>	36	1	55	8	99	5035	0	0	2	0	5240	65	2	0	4
<b>Morts.</b>	2	0	1	0	1	82	0	0	0	0	86	0	0	0	0

**Table 1: Snoqualmie River trap catch and mortalities 2012**

(Data is preliminary)

**April**

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</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>Resident Rainbow</i>						
<i>Day</i>	(89.3 hours of effort)														
<b>Catch</b>	9	0	17	49	33	4397	0	0	1	0	4507	0	0	0	0
<b>Morts.</b>	0	0	0	0	0	11	0	0	0	0	11	0	0	0	0
<i>Night</i>	(95.2 hours of effort)														
<b>Catch</b>	43	16	239	190	92	6813	15	0	0	0	7419	31	9	4	0
<b>Morts.</b>	1	0	10	0	0	74	0	0	0	0	85	0	0	0	0
<b>Monthly Totals</b>	(184.5 hours of effort)														
<b>Catch</b>	52	16	256	239	125	11210	15	0	1	0	11926	31	9	4	0
<b>Morts.</b>	1	0	10	0	0	85	0	0	0	0	96	0	0	0	0

**May**

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</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>Resident Rainbow</i>						
<i>Day</i>	(124.6 hours of effort)														
<b>Catch</b>	51	1	85	207	6	1678	5	3	0	0	2038	1	0	0	4
<b>Morts.</b>	1	0	3	0	0	0	0	0	0	0	4	0	0	0	0
<i>Night</i>	(112.4 hours of effort)														
<b>Catch</b>	93	1	381	856	25	431	55	60	0	1	1921	35	12	0	22
<b>Morts.</b>	1	0	1	2	0	3	0	0	0	0	7	0	0	0	0
<b>Monthly Totals</b>	(237.1 hours of effort)														
<b>Catch</b>	144	2	466	1063	31	2109	60	63	0	1	3959	36	12	0	26
<b>Morts.</b>	2	0	4	2	0	3	0	0	0	0	11	0	0	0	0

**Table 1: Snoqualmie River trap catch and mortalities 2012**

(Data is preliminary)

**June**

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</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>Resident Rainbow</i>						
<i>Day</i>	( 63.5 hours of effort)														
<b>Catch</b>	8	2	8	7	0	3	0	1	0	0	29	2	0	0	0
<b>Morts.</b>	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
<i>Night</i>	( 84.6 hours of effort)														
<b>Catch</b>	136	0	167	67	1	2	2	4	0	0	385	36	2	0	2
<b>Morts.</b>	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0
<b>Monthly Totals</b>	(148.1 hours of effort)														
<b>Catch</b>	144	2	175	74	1	5	2	5	0	0	414	38	2	0	2
<b>Morts.</b>	2	0	0	0	0	0	0	0	0	0	2	0	0	0	0

**Totals**

( 847.2 total hours of effort)

	<i>Chinook</i>		<i>Coho</i>		<i>Chum</i>	<i>Pink</i>	<i>Steelhead</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>Resident Rainbow</i>						
<b>Catch</b>	377	21	953	1384	258	18626	77	68	3	1	21810	185	25	5	32
<b>Morts.</b>	7	0	15	2	1	170	0	0	0	0	195	0	0	0	0
<b>Mortality Rate</b>	1.86%	0.00%	1.57%	0.14%	0.39%	0.91%	0.00%	0.00%	0.00%	0.00%	0.89%				
<b>% of Total Catch</b>	1.7%	0.1%	4.3%	6.3%	1.2%	84.4%	0.3%	0.3%	0.0%	0.0%	98.9%	0.8%	0.1%	0.0%	0.1%

**Table 2. Annual sampling effort and catch totals for sub-yearling Chinook and yearling coho at the Snoqualmie River Rotary screwtrap 2001-2012 (preliminary data).**

Year	Effort (hrs)	Chinook Unmarked 0+	Coho Unmarked 1+
2001	509	619	553
2002	780.3	653	1894
2003	945.5	882	1305
2004	1056	611	1127
2005	1017.8	677	1187
2006	992	761	2023
2007	509.5	120	615
2008	317.9	163	587
2009	632.1	259	754
2010	1157.8	357	1149
2011	500.8	284	1662
2012	847.2	377	1384

**Table 3. Statistical weeks and corresponding dates for 2012 sampling season.**

Statistical Week	2012		
	BegWeek	MidWeek	EndWeek
6	2/5	2/8	2/11
7	2/12	2/15	2/18
8	2/19	2/22	2/25
9	2/26	2/29	3/3
10	3/4	3/7	3/10
11	3/11	3/14	3/17
12	3/18	3/21	3/24
13	3/25	3/28	3/31
14	4/1	4/4	4/7
15	4/8	4/12	4/14
16	4/15	4/19	4/21
17	4/22	4/26	4/28
18	4/29	5/2	5/5
19	5/6	5/9	5/12
20	5/13	5/16	5/19
21	5/20	5/23	5/26
22	5/27	5/30	6/2
23	6/3	6/6	6/9
24	6/10	6/13	6/16
25	6/17	6/20	6/23
26	6/24	6/27	6/30

**Figure 1. Chinook sub-yearling (age 0+) and coho yearling (age 1+) migration patterns observed during 2012 at the Snoqualmie River trap, river mile 12.2 (preliminary data).**

