

## SKYKOMISH RIVER JUVENILE SALMON OUT-MIGRATION STUDY PROGRESS REPORT February – June 2012

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

On February 6<sup>th</sup> installation of the rotary screwtrap began. Fishing commenced on February 15<sup>th</sup> and ended on June 21<sup>th</sup>. The trap was fished for approximately 1015.7 hours over 84 days within a 19 week period. 557.5 of those hours were fished at night constituting 54.9% of fishing effort. The river was in unfishable condition (i.e. high debris and discharge levels) for 18 scheduled fishing events throughout the five month period. During the sampling season 193,578 salmon and trout were captured, counted and released. Unmarked Chinook sub-yearling totaled 1323 and Chinook yearlings equaled 22. Unmarked coho yearlings accounted for 3005 of this seasons catch. This year was a pink out-migration year, consequently 159,972 of our total catch was pink salmon (Table 1). This number is extensively lower than the previous pink out-migration catch. The number of Chinook sub-yearlings caught varies widely from year to year, this years' total is significantly higher than recent years recorded for the trapping project on the Skykomish River. The number of unmarked coho yearling caught is considerably higher than last year (Table 2).

During the trapping and handling process a total of 303 salmonid mortalities were reported. There was 19 Chinook sub-yearling mortalities during this trapping season. Mortality rates were calculated for all species and cohorts (Table 1). Mortality as a percentage of the total salmonid catch (1.44%) which is higher than the average recorded for the project.

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. A preliminary review of the data reveals that catch per unit effort (CPUE) for unmarked Chinook sub-yearlings was the highest during SW 16 when the capture rate was approximately 6.0 fish per hour (Figure 1). A smaller peak was recorded during statistical week 15 when about 4 fish were captured per hour. The timing of elevated catch levels appear to be fairly consistent within SW 11 and SW 17 for all the years recorded for this project. Migration for unmarked coho yearling appears to have taken place over a three week period. The first peak occurred during SW 18 when nearly 10 fish per hour was caught. Then during SW 19, 9.51 fish per hour were caught. The highest peak occurred during SW 20 recording when approximately 14.5 fish were caught per hour (Figure 1). The timing of coho migration is quite constant every year since we began monitoring this site in 2000. In all years the peak migrations occurred between SW 18 and SW 22. 2012 migration occurs within this scope.

A total of eight trap efficiency tests (5 with Chinook sub-yearlings and 3 with coho yearlings) were conducted on eight 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. The results of these tests are still being evaluated, but preliminary calculations suggest that the trap was operating at an efficiency rate of 2.54% for Chinook sub-yearlings and 1.11% for coho yearlings during the 2012 sampling period. The results of the efficiency tests using Chinook sub-yearlings efficiency is higher than any other year documented for the project. This may be due to the change in efficiency testing protocol. This year releases took place in the evenings as opposed to mornings or early afternoon as in previous years. And instead of 1000 fish, 2000 fish were released during each test. Trap efficiency for coho yearlings observed this year is within the average for this project and did not have any drastic change with the difference in protocol.

### 2. Project status and difficulties.

The 2012 field season ran smoothly when it was not affected by the river discharge levels. Fishing was interrupted on 5 occurrences due to high debris and river levels. On February 21, 2012 the lines had to be taken down due to impending flooding. The river level rose 23,500 cfs pushing training of employees back four days. On February 25<sup>th</sup> the lines were put back up and fishing commenced. In April the lines had to be taken down again due to a forecast of flooding. On the 23<sup>rd</sup> the lines were taken down and the river rose to 15,000 cfs. The river maintained a fairly high level for over week until May 3<sup>rd</sup> when the lines were put back up again. During this incident 1 scheduled fishing event had to be cut short and 9 scheduled fishing events could not be fished. The river level increased to 14,000 cfs on May 14<sup>th</sup> cutting short 1 fishing event and causing 1 fishing event not to take place. The trap began sampling again on May 16<sup>th</sup>. On May 22<sup>nd</sup> the river levels rose again to 17,000 cfs stopping fishing until May 24<sup>th</sup> in which time 3 scheduled fishing events had to be cancelled. The last impediment to sampling efforts happened on June 1<sup>st</sup> when the river level again reached 17,000 cfs and fishing did not start again until June 4<sup>th</sup>. 3 scheduled fishing events had to be cancelled during this time. Due to these incidences the trap did not operate as many hours as planned, however as much sampling time as possible was made up during good fishing conditions.

In 2012, another sampling endeavor was added to the regular trapping effort. In cooperation with Washington State Department of Fish and Wildlife, all wild Chinook caught in the trap were clipped for DNA sampling. During the monitoring season approximately 1275 DNA samples were taken.

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

(Data is preliminary)

**February**

	<i>Chinook</i>					<i>Coho</i>					<i>Steelhead</i>					<i>Dolly/Bull Trout</i>	<i>Total Salmonid Catch</i>	<i>Juv. Lamp.</i>	<i>Dace spp.</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Unm 0+</i>	<i>Mark 0+</i>	<i>0+</i>	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Chum</i>	<i>Pink</i>	<i>Sockeye</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>	<i>Cut. Trout</i>	<i>Rain. Trout</i>	<i>Trout Fry</i>						
<i>Day</i>	(59.9 hours of effort)																				
<b>Catch</b>	0	0	1	0	11	1	0	5	285	0	0	0	0	0	2	0	305	0	2	0	4
<b>Morts.</b>	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0
<i>Night</i>	(71.4 hours of effort)																				
<b>Catch</b>	1	0	45	0	34	9	0	94	986	0	1	0	0	0	2	0	1172	3	18	10	0
<b>Morts.</b>	0	0	1	0	0	0	0	1	4	0	0	0	0	0	0	0	6	0	0	0	0
<b>Monthly Totals</b>	(131.3 hours of effort)																				
<b>Catch</b>	1	0	46	0	45	10	0	99	1271	0	1	0	0	0	4	0	1477	3	20	10	4
<b>Morts.</b>	0	0	1	0	0	0	0	1	5	0	0	0	0	0	0	0	7	0	0	0	0

**March**

	<i>Chinook</i>					<i>Coho</i>					<i>Steelhead</i>					<i>Dolly/Bull Trout</i>	<i>Total Salmonid Catch</i>	<i>Juv. Lamp.</i>	<i>Dace spp.</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Unm 0+</i>	<i>Mark 0+</i>	<i>0+</i>	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Chum</i>	<i>Pink</i>	<i>Sockeye</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>	<i>Cut. Trout</i>	<i>Rain. Trout</i>	<i>Trout Fry</i>						
<i>Day</i>	(101.8 hours of effort)																				
<b>Catch</b>	0	0	36	1	9	6	0	116	4344	0	0	0	0	0	0	0	4512	0	0	2	0
<b>Morts.</b>	0	0	1	0	0	0	0	0	8	0	0	0	0	0	0	0	9	0	0	0	0
<i>Night</i>	(161.9 hours of effort)																				
<b>Catch</b>	1	0	141	0	228	57	0	5528	33979	0	4	0	0	0	0	0	39938	4	29	25	2
<b>Morts.</b>	0	0	0	0	7	0	0	43	54	0	0	0	0	0	0	0	104	0	0	0	0
<b>Monthly Totals</b>	(263.7 hours of effort)																				
<b>Catch</b>	1	0	177	1	237	63	0	5644	38323	0	4	0	0	0	0	0	44450	4	29	27	2
<b>Morts.</b>	0	0	1	0	7	0	0	43	62	0	0	0	0	0	0	0	113	0	0	0	0

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

(Data is preliminary)

**April**

	<i>Chinook</i>					<i>Coho</i>					<i>Steelhead</i>					<i>Dolly/ Bull Trout</i>	<i>Total Salmonid Catch</i>	<i>Juv. Lamp.</i>	<i>Dace spp.</i>	<i>Sculpin spp.</i>	<i>Stickle- back</i>
	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Unm 0+</i>	<i>Mark 0+</i>	<i>0+</i>	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Chum</i>	<i>Pink</i>	<i>Sockeye</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>	<i>Cut. Trout</i>	<i>Rain. Trout</i>	<i>Trout Fry</i>						
<i>Day</i>	(93.0 hours of effort)																				
<b>Catch</b>	1	10	47	15	14	35	0	598	13120	0	0	0	0	1	0	0	13841	0	5	0	0
<b>Morts.</b>	0	0	0	0	0	0	0	3	14	0	0	0	0	0	0	0	17	0	0	0	0
<i>Night</i>	(104.9 hours of effort)																				
<b>Catch</b>	17	166	693	37	342	144	1	14319	82406	0	8	7	3	0	0	0	98143	4	32	9	0
<b>Morts.</b>	0	0	11	0	3	1	0	1	56	0	0	0	0	0	0	0	72	0	0	0	0
<b>Monthly Totals</b>	(197.9 hours of effort)																				
<b>Catch</b>	18	176	740	52	356	179	1	14917	95526	0	8	7	3	1	0	0	111984	4	37	9	0
<b>Morts.</b>	0	0	11	0	3	1	0	4	70	0	0	0	0	0	0	0	89	0	0	0	0

**May**

	<i>Chinook</i>					<i>Coho</i>					<i>Steelhead</i>					<i>Dolly/ Bull Trout</i>	<i>Total Salmonid Catch</i>	<i>Juv. Lamp.</i>	<i>Dace spp.</i>	<i>Sculpin spp.</i>	<i>Stickle- back</i>
	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Unm 0+</i>	<i>Mark 0+</i>	<i>0+</i>	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Chum</i>	<i>Pink</i>	<i>Sockeye</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>	<i>Cut. Trout</i>	<i>Rain. Trout</i>	<i>Trout Fry</i>						
<i>Day</i>	(112.5 hours of effort)																				
<b>Catch</b>	0	0	16	19	12	64	6	127	4950	0	1	11	0	0	0	0	5206	1	0	0	1
<b>Morts.</b>	0	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	5	0	0	0	0
<i>Night</i>	(161.0 hours of effort)																				
<b>Catch</b>	2	2	233	154	672	2519	301	2038	19766	0	46	1446	1	0	0	1	27181	5	23	6	5
<b>Morts.</b>	0	0	6	0	5	0	0	3	60	0	0	0	0	0	0	0	74	0	0	0	0
<b>Monthly Totals</b>	(273.5 hours of effort)																				
<b>Catch</b>	2	2	249	173	684	2583	307	2165	24716	0	47	1457	1	0	0	1	32387	6	23	6	6
<b>Morts.</b>	0	0	6	0	5	0	0	4	64	0	0	0	0	0	0	0	79	0	0	0	0

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

(Data is preliminary)

**June**

	<i>Chinook</i>					<i>Coho</i>					<i>Steelhead</i>					<i>Dolly/Bull Trout</i>	<i>Total Salmonid Catch</i>	<i>Juv. Lamp.</i>	<i>Dace spp.</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Unm 0+</i>	<i>Mark 0+</i>	<i>0+</i>	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Chum</i>	<i>Pink</i>	<i>Sockeye</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>	<i>Cut. Trout</i>	<i>Rain. Trout</i>	<i>Trout Fry</i>						
<i>Day</i>	( 91.0 hours of effort)																				
<b>Catch</b>	0	0	23	158	43	77	0	4	42	0	0	1	0	0	0	0	348	0	0	1	0
<b>Morts.</b>	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	3	0	0	0	0
<i>Night</i>	( 58.3 hours of effort)																				
<b>Catch</b>	0	0	88	2067	562	93	2	14	94	0	1	9	0	0	0	2	2932	6	13	0	1
<b>Morts.</b>	0	0	0	0	12	0	0	0	0	0	0	0	0	0	0	0	12	0	0	0	0
<b>Monthly Totals</b>	(149.3 hours of effort)																				
<b>Catch</b>	0	0	111	2225	605	170	2	18	136	0	1	10	0	0	0	2	3280	6	13	1	1
<b>Morts.</b>	0	0	0	0	12	0	0	0	3	0	0	0	0	0	0	0	15	0	0	0	0

**Totals**

( 1015.7 total hours of effort)

	<i>Chinook</i>					<i>Coho</i>					<i>Steelhead</i>					<i>Dolly/Bull Trout</i>	<i>Total Salmonid Catch</i>	<i>Juv. Lamp.</i>	<i>Dace spp.</i>	<i>Sculpin spp.</i>	<i>Stickle-back</i>
	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Unm 0+</i>	<i>Mark 0+</i>	<i>0+</i>	<i>Unm 1+</i>	<i>Mark 1+</i>	<i>Chum</i>	<i>Pink</i>	<i>Sockeye</i>	<i>Unm Smolts</i>	<i>Mark Smolts</i>	<i>Cut. Trout</i>	<i>Rain. Trout</i>	<i>Trout Fry</i>						
<b>Catch</b>	22	178	1323	2451	1927	3005	310	22843	159972	0	61	1474	4	1	4	3	193578	23	122	53	13
<b>Morts.</b>	0	0	19	0	27	1	0	52	204	0	0	0	0	0	0	0	303	0	0	0	0
<b>% Mort</b>	0.00%	0.00%	1.44%	0.00%	1.40%	0.03%	0.00%	0.23%	0.13%		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.16%				
<b>% of Total Catch</b>	0.0%	0.1%	0.7%	1.3%	1.0%	1.6%	0.2%	11.8%	82.5%	0.0%	0.0%	0.8%	0.0%	0.0%	0.0%	0.0%	99.9%	0.0%	0.1%	0.0%	0.0%

**Table 2. Annual sampling effort and catch totals for unmarked Sub-yearling Chinook and yearling Coho at the Skykomish River rotary screwtrap 2000-2012 (preliminary data).**

Year	Effort (hrs)	Chinook Unmarked 0+	Coho Unmarked 1+
2000	308.5	1287	5972
2001	900.6	1786	5512
2002	671.7	1093	8851
2003	992.1	3394	8713
2004	1071	951	13949
2005	944.3	2411	3082
2006	1125.3	2928	6218
2007	446.8	1348	3882
2009	686.6	1650	1410
2010	1045.8	1989	1245
2011	666.8	765	1798
2012	1015.7	1323	3005

**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 (1+) migration patterns observed during 2012 at the Skykomish River trap, river mile 26.5. (preliminary data).**

