

2012-13 Lower Columbia Fall Chinook Survey Summary

This report provides a brief summary of results from fall Chinook spawning ground surveys conducted in the Lower Columbia ESU in 2012-13. Site selection and survey methods mirrored those used for coho spawning ground surveys in the Lower Columbia. No fall Chinook surveys were conducted for the Upper Gorge population because points were pulled at the lower Columbia Coho population complex scale. The Upper Gorge is included within the Hood River Coho population for this summary. Plympton Creek is within the Clatskanie population, but is reported separately here because of the hatchery influence present in this site.

Survey Effort

- Approximately 88 sites had at least one survey conducted in 2012. The number of sites currently being attempted for the 2013 effort is 79.
- 46 of the attempted 88 sites were successfully surveyed (52%).
- The majority of non-response sites either had an insufficient number of surveys conducted (≥ 4 times), or incurred gaps between surveys of more than thirteen days. Poor survey conditions such as turbidity and/or high flows are the most common contributors to these site outcomes. The remaining non-response sites are inaccessible due to landowner denial (3 sites), remote and unreachable locations (2) or dangerous floating conditions (4).
- All sites surveyed seemed to be within Fall Chinook spawning habitat

Table 1. Lower Columbia Fall Chinook ESU, GRTS spawning survey goals and results for number of valid surveys, 2012 run year. Target Response sites are within spawning habitat and were successfully surveyed in terms of survey qualification protocol. Successful surveys were defined as having no gaps between valid survey dates of 13 or more days, and no more than one gap of 9 to 12 days during the period when 90% of the live Chinook were observed for the stratum.

Stratum	Population	Goal	Target Response
			2012
Coast	Youngs Bay	6	11
	Big Creek	4	6
	Clatskanie	5	3 (5)
	Scappoose	4	3
	Total	19	25
Cascade	Clackamas	11	13
	Sandy	25	4
	Total	36	17
Gorge	Lower Gorge	2	3
	Hood	2	1
	Total	4	4
ESU Total		59	46

Distribution and Timing

- Live adult Chinook were observed in 70% of the surveys completed, which appears to be an increase over previous years.
- No live adults (or carcasses) were observed in the surveys attempted for the Scappoose population. This is consistent with survey outcomes for this area in 2009-2011 and the first half of the 2013 spawning year (in process at time of press).
- The number of live adults observed in each population varied considerably, ranging between 0 in the Lower Gorge population to 3320 in Youngs Bay. . Out of the five surveys in the Clatskanie population, Plympton Creek contributed all but 12 of the 2678 fish observed in the population.
- More than 75% of surveys completed for both the Clackamas and Sandy populations were located on main stem environments (i.e., Sandy R, Clackamas R, Bull Run R, Salmon R, or Zig Zag R). The number of live adults observed in the Clackamas and Sandy populations is likely an underestimate due to the difficulties of surveying main stem sites (i.e. covering the entire width of river and lack of visibility in deep holes).
- Median adult peak date ranged from 9/25/11 to 10/24/11 (Table 2).

Table 2. Total numbers of Chinook observed and peak information by Lower Columbia population, 2012. Peak date calculations represent data from all surveys attempted and do not screen for surveys deemed unsuccessful by AUC criteria. All other data shown in this table are from successful surveys.

Population	No. of Survey Segments	No. Surveys w/ Live Adults	Total Live Adults Observed	Median Adult Peak Date	Avg. Peak/mile
Youngs Bay	11	11	3320	10/14/2012	247
Big Creek ²	6	4	1064	10/8/2012	79
Clatskanie ³	3	1	12	10/10/2012	4.5
Plympton Cr	1	1	2666	9/25/2012	1071
Scappoose	3	0	0	-	-
Clackamas	13	10	120	10/18/2012	4
Sandy	4	3	14	10/24/2012	12
Lower Gorge	3	0	0	-	-
Hood ¹	1	1	34	10/09/2012	17.5

¹ The Hood population complex is a combination of both Upper Gorge and Hood population surveys.

² The avg peak/mile for Big Cr without the Big Cr survey is 39.

³ Plympton Creek is within the Clatskanie Population, but the very high hatchery influence at this site is not found in any other streams in this area. As a result estimates and other reported statistics are shown separately.

H:W information

- The percentage of unmarked carcasses recovered on the spawning ground varied from 4% to 80%, with most population areas appearing to have very high hatchery influence (Figure 1).
- At least some of the 45 marked carcasses recovered for the Sandy population are likely Spring Chinook, not Fall Chinook.
- Unmarked fish in the Big Cr population had an occurrence rate of CWT's over 10%, indicating that a relatively high percentage of unmarked fish in this area are of hatchery origin. The same has been true in the Clatskanie population in past years due to the large number of hatchery fish in Plympton Cr, where the 2012 percentage of unmarked fish that had CWT's was approximately 19%. (Table 3).

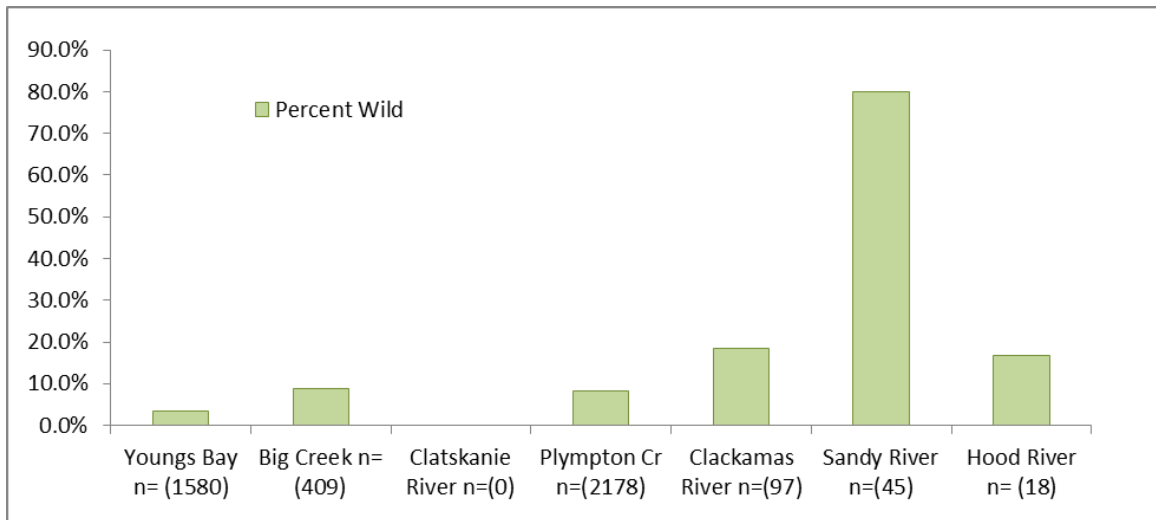


Figure 1. The ratio of unmarked to marked Chinook carcasses observed on the spawning ground by Lower Columbia population. The total number of carcasses recovered is also displayed by population.

Table 3. The percentage of marked and unmarked carcasses from each population in the Lower Columbia that contained coded wire tags during 2012. Snout wands were used on all carcasses to identify the presence of CWT's.

PopulationName	% unmarked fish with CWT tags	% Marked fish with CWT
Big Creek	10%	5%
Clackamas River	0%	8%
Clatskanie River	N/A	N/A
Plympton	19%	3%
Hood River	0%	0
Sandy River	0%	18%
Scappoose River	N/A	N/A
Youngs Bay	0%	1%

Table 4: Preliminary and final results of randomly selected spawning ground surveys for Chinook salmon in the Oregon portion of the LCR ESU, run year 2012. Estimates derived using GRTS protocol. Preliminary estimates include all sites which were surveyed ≥ 4 times during the survey season regardless of gaps in survey effort. Final estimates are based on sites that passed qualifying criteria; qualifying surveys were defined as having no gaps between valid survey dates of 13 or more days, and no more than one gap of 12 to 15 days during the period when 90% of the live Chinook were observed for the stratum. Estimates of wild spawners derived through application of fin-mark observations. Missing values for populations indicate inadequate samples for determining total and/or wild abundance.

ESU, Stratum, and TRT Population	Survey Effort		Adult Chinook Spawner Abundance			
	Number of		Total		Wild	
	Surveys	Miles	Estimate	95% CI	Estimate	95% CI
2012 Preliminary						
Lower Columbia ESU	76	92.1	23,061	13,789	1,961	1,102
Coast Stratum	30	29.7	21,893	13,763	1,162	876
Youngs Bay	13	14.8	6098	2,745	152	68
Big Creek	6	5	1,096	1,570	55	79
Clatskanie River	5	5.3	14,699	13,395	954	870
Scappoose River	6	4.7	0	0	-	-
Cascade Stratum	42	59.6	1,168	842	799	669
Clackamas River	19	29.7	220	105	41	19
Sandy River	23	29.9	948	836	759	668
Gorge Stratum	4	2.7	0	0	-	-
Lower Gorge	3	1.4	0	0	-	-
Hood River	1	1.3	-	-	-	-
2012 Final						
Lower Columbia ESU	46	53.5	11,974	3,503	1,107	351
Coast Stratum	25	25.2	10,939	3,474	479	112
Youngs Bay	11	13.3	6,686	3,098	170	79
Big Creek	6	5	1,096	1,570	55	79
Clatskanie River	3	3.3	94	93	-	-
<i>Plympton Cr</i>	2	2.1	3,111	0	206	0
Scappoose River	3	1.6	0	0	0	0
Cascade Stratum	17	25.6	1,035	444	627	333
Clackamas River	13	21.9	321	153	60	28
Sandy River	4	3.7	714	417	568	332
Gorge Stratum	4	2.7	0	0	-	-
Lower Gorge	3	1.4	0	0	-	-
Hood River	1	1.3	-	-	-	-

Future Monitoring Concerns

- **Fall vs Spring Chinook:** One of the apparent issues that arose while analyzing the live count and carcass data in the Sandy and Clackamas populations was how to separate Fall from Spring Chinook. Our original hope was that we could separate fish both temporally and spatially. Considerable variability seemed to exist between when Chinook arrived and where they spawned. We were also unable to differentiate Fall versus Spring Chinook carcass recoveries based on morphological characteristics. We are collecting fin-samples (for DNA analysis) in the Sandy basin in coordination with the Willamette Spring Chinook project; however, no priorities (read – money) are set to have those analyzed.
- **Survey effort:** Hatchery influenced sites such as Plympton Cr. and Big Cr require nearly full-time attention by multiple crews to maintain sampling schedules due to the high volume of carcass recoveries. These surveys draw crews away from other sites, and dilute the ability to detect spawning activity in the other surveys around the area. Additional effort provided by crews not funded under this project has elevated this issue for the 2012-13 spawning year, but increased returns of hatchery strays in the Young's Bay population continue to stretch available effort.
- **Hatchery influenced sites:** Despite a lack of an adjacent hatchery, Plympton Cr in the Clatskanie River population draws large numbers of hatchery fish. No other stream in this area exhibits this density of fish, and as a result this single survey causes estimates for the Clatskanie population to be positively biased. Future estimates will be made more accurate by separating Plympton Cr from the initial calculation of the population estimate.
- **Main stem float surveys:** We continue to have trouble keeping main stem float surveys on the Sandy in rotation. Multiple survey gaps exist for those surveys due to high flows and visibility issues. It is our opinion that these survey methods are not well suited to this environment, and alternate methods may be required to reach monitoring goals within the Sandy Basin. The Hood River Basin provides even greater challenges, as it combines inaccessible areas with similarly poor conditions
- **Spawning residence time:** A brief review of the fall Chinook/Tule literature suggests that spawning residence time ranges from 5 – 8 days (Rawdig et al. 2006 and Parken et al. 2003). Our crews surveyed under the Coho criteria of conducting a survey at least every 10 days. Anecdotal evidence of spawn timing on Plympton Cr suggest that residence times are likely higher than those specified by Rawdig, but these patterns remain untested.