

## 2010 Snake River Fall Chinook Salmon Spawning Summary

by

Bill Arnsberg, Nez Perce Tribe

Aaron Garcia, U.S. Fish and Wildlife Service

Phil Groves, Idaho Power Company

Debbie Milks, Washington Department of Fish and Wildlife

Robert Mueller, Pacific Northwest National Laboratory

January 31, 2011

Fall Chinook salmon redd surveys were conducted cooperatively by biologists from the Idaho Power Company (IPC), Nez Perce Tribe (NPT), U.S. Fish and Wildlife Service (USFWS), and the Washington Department of Fish and Wildlife (WDFW) during 2010. This was the 23<sup>rd</sup> year that intensive, cooperative aerial surveys have been conducted in the Snake River and most major tributaries above Lower Granite Dam and 19<sup>th</sup> year for ground surveys in tributaries downstream of Lower Granite Dam. Areas immediate below the four lower Snake River dams were not surveyed in 2010. A total of 5,626 redds were observed in the Snake River Basin (Table 1), representing the highest count since inception of intensive surveys in 1988. This year's redd count surpassed the previous record count set in 2009 by 1,910 redds. Due to safety concerns and to reduce risks of conducting weekly flights, the number of aerial surveys was reduced to three or four flights this year in major spawning rivers.

Table 1. Number of fall Chinook salmon redds observed in the Snake River Basin, 2010 (all aerial counts except as noted, N/S = no survey).

Survey Area	Number of Redds
Snake River (aerial and ground)	1,950
Snake River (underwater video)	994
<b>Total Snake River</b>	<b>2,944</b>
Clearwater River	1,632
Potlatch River (aerial and ground)	281
N.F. Clearwater River	8
S.F. Clearwater River	2
M.F. Clearwater River	0
Selway River	1
<b>Total Clearwater River Subbasin</b>	<b>1,924</b>
Grande Ronde River	263
Wallowa River	0
Wanaha River	0
<b>Total Grande Ronde River Subbasin</b>	<b>263</b>
Imnaha River	<b>132</b>
Salmon River	<b>8</b>
Tucannon River (ground) <sup>1</sup>	<b>324</b>
Asotin Creek	<b>4</b>
Alpowa Creek (ground)	<b>31</b>
<b>Grand Total Snake River Basin</b>	<b>5,626</b>

<sup>1</sup> Estimated total count.

During aerial, ground, and underwater video counts, IPC and USFWS staff observed a total of 2,944 redds in the mainstem Snake River (Table 1). Fall Chinook salmon aerial redd surveys along the mainstem Snake River occurred bi-weekly during the spawning season, beginning on 25 October, and ending on 6 December. The flows from the Hells Canyon Dam were maintained fairly stable at approximately 8,800 cfs from 11 October through 12 December. The four aerial surveys attempted to cover the river corridor between Asotin, Washington, and the Hells Canyon Dam (approximately 100 river miles). Visibility during aerial surveys was poor to good throughout the season. Poor weather conditions (strong winds and heavy snowfall) in both the lower and upper river section caused us to either postpone or abort surveys early on 25 October and 23 November (at RM 228, and 237, respectively). However, good counts were still obtained by the end of the season. Additionally, intensive deepwater spawning searches were conducted throughout the main river corridor, using remote underwater video cameras, in areas too deep to be viewed from the air. The deepwater searches began in mid-November, and were completed in early December. Spawning was estimated to have begun during mid-October (60 redds observed on 25 October), appeared to peak in early November (973 new redds observed on 9 November), and was determined to be complete by early December (261 new redds observed on 6 December, the final survey). Approximately 55% of redds observed during aerial surveys were constructed by 9 November. During aerial surveys we observed a total of 1,891 redds, constructed at 124 distinct spawning locations. An additional 59 redds were observed during intensive ground surveys of four shallow water sites. The deepwater searches located an additional 994 redds at 57 sites. For 2010 the total redd count for the Snake River was 2,944. Since 2002, the mean number of redds occurring in the Snake River (including deep water counts) has been 1,643, ranging between 1,025 and 2,944. The lowest redd count for the Snake River, since intensive surveys began, was 46 redds in 1991, while the highest count was 2,944 redds in 2010.

During aerial and ground surveys, NPT staff observed a total of 1,924 redds in the Clearwater River Subbasin (Table 1). Redd searches covered the entire Clearwater River from Potlatch Mill in Lewiston, Idaho to the forks of the South Fork and Middle Fork Clearwater rivers (approximately 71 miles), lower Potlatch River (10 miles), about one half mile of the lower North Fork Clearwater River below Dworshak Dam, the entire Middle Fork Clearwater River (22 miles), lower South Fork Clearwater River (14 miles), and lower Selway River (19 miles). There were 390 redds observed during the first survey on 18 October in the lower Clearwater, 773 new redds observed on 1 November, and 420 new redds on 29 November. Three surveys conducted in the upper mainstem Clearwater Subbasin (Orofino Creek upstream to Middle Fork Clearwater) on 20 October, 1 November, and 6 December resulted in 11, 21, and 17 new redds, respectively. The North Fork Clearwater was surveyed the same dates as the lower Clearwater with 8 new redds observed on 1 November. Spawning was near completion by 29 November on the Clearwater with few live fish observed. Rains muddied the waters in November resulting in only fair survey conditions on the last survey, thus a number of previous deep water redds and new deep redds could not be seen in the Clearwater. During the spawning period, discharges from Dworshak Reservoir remained relatively stable at 1,600 cfs during surveys. Flows on the lower Clearwater (USGS Gauging Station at Spalding, ID) was low at 3,080 cfs on 18 October and increased to 4,610 cfs by 29 November, the last survey. Potlatch River was surveyed on 18 October and on 29 November from the mouth up to the town of Kendrick. Six redds were observed on the first survey and new redds were hard to see on the second survey, even though visibilities were good. A great number of carcasses seen on the second survey prompted a

ground survey on 9 December from the mouth up to Rm 5. A total of 281 redds were counted from the ground, a 110 carcass subsample was collected, and a number of live fish were still spawning. A total of 249 fall Chinook carcasses were collected in Potlatch River and only one pre-spawned female coho was collected, therefore we attributed all 281 redds counted to fall Chinook. Two surveys conducted on the S.F. Clearwater and Selway rivers resulted in one redd observed on 20 October in the Selway and two redds observed on 6 December in the S.F. Clearwater. Survey conditions in the upper Clearwater Subbasin were good to excellent on both surveys. No redds were observed in the M.F. Clearwater River. We continue to observe redds in new spawning locations throughout the Clearwater Subbasin. Since 2003, the mean number of redds occurring in the Clearwater River Subbasin has been 874, ranging between 487 and 1,924 (average included a redd estimate of 514 redds in 2006, because of turbid conditions and missed surveys after peak spawning). The lowest redd count for the Clearwater River Subbasin, since intensive surveys began, was four redds in both 1990 and 1991, while the highest count was 1,924 redds in 2010.

A total of three aerial surveys conducted by NPT staff on the Grande Ronde River resulted in a total of 263 redds observed (Table 1). Surveys on 19 October, 15 November, and 6 December resulted in 14, 232, and 17 new redds counted, respectively. Redd surveys covered the mouth up to the Wildcat Bridge past the town of Troy (53 miles). During the last survey on 6 December, the extended area of the Grande Ronde from Wildcat Bridge up to the Wallowa River (29 miles), lower Wallowa River (10 miles), and lower Wenaha River (11 miles) were surveyed. A total of 2 redds were observed in the Grande Ronde River about 5.9 miles above Wildcat Bridge. Redds were seen in new spawning areas and totaled 50 distinct locations. No redds were observed in the Wallowa and Wenaha rivers. Survey conditions remained good to excellent during much of the season. Flows fluctuated only slightly between 717 cfs and 1,090 cfs. Since 2003, the mean number of redds occurring in the Grande Ronde River Subbasin has been 132, ranging from 41 to 263. The lowest redd count for the Grande Ronde River, since intensive surveys began, was zero in 1989 and 1991, while the highest count was 263 in 2010.

A total of three aerial surveys conducted by NPT staff on the Imnaha River resulted in a total of 132 redds observed (Table 1). Surveys on 19 October, 15 November, and 7 December resulted in 0, 32, and 100 new redds counted, respectively. Surveys were conducted from the mouth up to the town of Imnaha (19 miles). Redd initiation seemed to be later this year as no redds were counted on the 19 October survey. Flows during surveys ranged from 145 to 201 cfs. Survey conditions were excellent on the first and last survey, but only fair on the second survey resulting in more redds (75% of the total) seen on the last survey. Since 2003, the mean number of redds occurring in the Imnaha River has been 50, ranging from 17 to 132. The lowest redd count for the Imnaha River, since intensive surveys began was zero redds in 1994, while the highest count was 132 in 2010.

A total of two aerial surveys conducted by NPT staff on the Salmon River resulted in a total of eight redds observed (Table 1). A survey on 3 November resulted in 8 redds counted with no new redds counted on 7 December. The first survey was conducted from the mouth up to French Creek (105 miles) while the second survey was conducted from the mouth up to Slate Creek. Flows were moderate during surveys beginning at 5,200 cfs on the first survey declining to 4,680 cfs on the last survey. Survey conditions were only fair on both surveys resulting in deeper

spawning areas not being visible for counting redds. Since 2003, the mean number of redds occurring in the Salmon River has been 19, ranging between 9 and 34. The lowest redd count for the Salmon River, since intensive surveys began in 1992, was zero redds in both 1999 and 2000, while the highest count was 34 in 2009.

Although not surveyed in recent years and curious on a tip that fall Chinook were actively spawning in Alpowa Creek in Washington, NPT staff surveyed the lower end of Alpowa Creek from the ground on 18 November and 9 December and observed 28 and three new redds, respectively for a total of 31 redds (Table 1). Alpowa Creek was walked from approximately 100 yards up from its entrance with Lower Granite Reservoir up to about 100' past the highway 12 bridge. A total of 18 fall Chinook carcasses were collected while numerous others were observed up along the shoreline and mostly consumed by animals. On the December 9 survey, there were approximately a dozen live fall Chinook still on or near redds. In years prior (1988-1991), WDFW staff walked the lower 1.5 km of Alpowa Creek but neither fish nor redds were observed so surveys ceased until 2010.

WDFW staff surveyed 92% of the lower 20 miles of the Tucannon River from 27 October until 21 December. Staff counted 296 redds (fall Chinook and coho) which expands to 336 when adjusted for estimated redds built in sections not surveyed. The estimated number of fall Chinook redds was determined by applying the proportion of fall Chinook carcasses recovered to the estimated total number of redds constructed. We estimate 324 total redds were dug by fall Chinook in 2010 (Table 1). The first redds were observed on 27 October, and we estimate peak spawning occurred during the week of 21 October. Flows were low to moderate with good to excellent visibility during surveys, although cold weather prevented us from walking surveys the week of 21 November. Since 2003, the mean number of redds in the Tucannon has been 158, ranging from 66 to 324. The lowest redd count for the Tucannon River was 16 and occurred in 1987, the first year intensive surveys began, while the highest estimate was in 2010.

No surveys were conducted in the tailrace regains of the four lower Snake River dams by the Pacific Northwest National Laboratory in 2010. The US Army Corps of Engineers funds these surveys on a programmatic basis. It is anticipated that deepwater redd surveys will be funded in 2011 at several dams.

Final results will be provided in annual reports to Bonneville Power Administration. Past reports can be found at [www.bpa.gov](http://www.bpa.gov).