FISH PASSAGE CENTER

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Mr. Brent Snider
Idaho Department of Fish and Game
HC 64, Box 9905
Stanley, ID 83278

Dear Brent-

The Fish Passage Center has been marking spring Chinook from Sawtooth Hatchery over the last several years as part of the Comparative Survival Study (CSS). For purposes of these studies data are collected on either the juvenile life stage, or both the juvenile and adult life stages. The CSS is a multi-year program that estimates survival rates over different life stages for spring and summer Chinook and steelhead produced in major hatcheries. We would like to share with you some of the information we developed under these studies for the fish used from Sawtooth Hatchery in 2011 and past years.

With the marking efforts over the past several years, information on the timing and migration speed from the hatchery to Lower Granite Dam is available. In addition, as part of the CSS study, juvenile survival estimates are developed for the hydrosystem between Lower Granite and Bonneville Dams, as well as survival to adulthood of different passage histories.

Table 1 provides estimates of minimum, median, and maximum travel times for each year's release to Lower Granite Dam. Also provided are estimates of the 95% confidence limits around the estimated median travel time. For comparison purposes, separate travel times are provided for each of the different release sites as well as for all release sites combined.

In addition, we are providing you with the estimated 10%, 50%, and 90% passage dates of yearling spring Chinook (Table 2) juveniles at Lower Granite Dam for each of the years of tagging. As with the travel time tables, Table 2 provides separate estimates for each of the release sites, as well as the entire release for each year. Figure 1 provides an illustration of the arrival timing of each group of fish (i.e., each release site) to Lower Granite Dam.

Table 1. Travel times (release to LGR) of Sawtooth Hatchery yearling spring Chinook.

Migration Year	Release Site	Release Date	Travel Time (Days) Min	Med	Max	95% Confidence Limits Lower	Upper
2007	SAWT	4/11	15.0	26.6	48.1	26.4	26.9
2008	SAWT	4/23	12.8	20.4	49.7	20.2	20.6
2009	SAWT	4/14	8.3	22.0	49.0	21.6	22.3
2010	SAWT	4/9	15.7	29.3	70.4	28.5	29.6
	YANKFK	4/20	11.2	29.9	57.6	29.6	30.2
	All Sites	4/9, 4/20	11.2	29.6	70.4	29.2	29.8
2011	SAWT	4/1	12.2	39.5	68.3	39.3	39.6
	YANKFK	4/19-4/20	15.2	24.5	45.6	23.8	24.8
	All Sites	4/1, 4/19-4/20	12.2	39.3	68.3	39.2	39.3

Table 2. Estimated 10%, 50%, and 90% passage dates of PIT-tagged Sawtooth Hatchery yearling spring Chinook at Lower Granite Dam.

Migration Year	Release Site	Release Date(s)	10% Passage Date	50% Passage Date	90% Passage Date
2007	SAWT	4/11	2-May	8-May	13-May
2008	SAWT	4/23	10-May	14-May	19-May
2009	SAWT	4/14	28-Apr	6-May	17-May
2010	SAWT	4/9	1-May	8-May	20-May
	YANKFK	4/20	13-May	20-May	25-May
	All Sites	4/9, 4/20	1-May	11-May	21-May
2011	SAWT	4/1	2-May	11-May	16-May
	YANKFK	4/19-4/20	10-May	14-May	20-May
	All Sites	4/1, 4/19-4/20	2-May	11-May	16-May

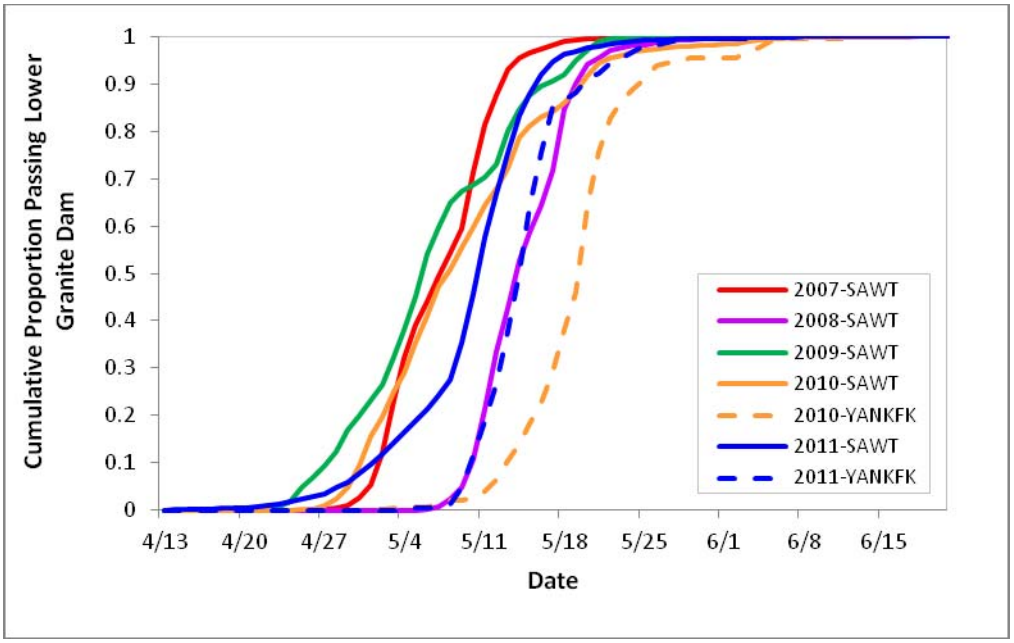

Figure 1. Cumulative passage timing of Sawtooth Hatchery yearling spring Chinook to Lower Granite Dam.

Figures 2 and 3 are provided below to illustrate the out-migration conditions that these spring migrants may have experienced in the Snake and Lower Columbia rivers. Figure 2 provides the total spring flow volume (Apr. 3-June 20) for the Snake River (as measured at Ice Harbor), along with the average spring spill proportions at each of Lower Granite, Little Goose, Lower Monumental, and Ice Harbor dams, for each migration year. Figure 3 provides the total spring flow volume (Apr. 10-June 30) for the Lower Columbia (as measured at Bonneville), along with the average spring spill proportions at each of McNary, John Day, The Dalles, and Bonneville dams, for each migration year.

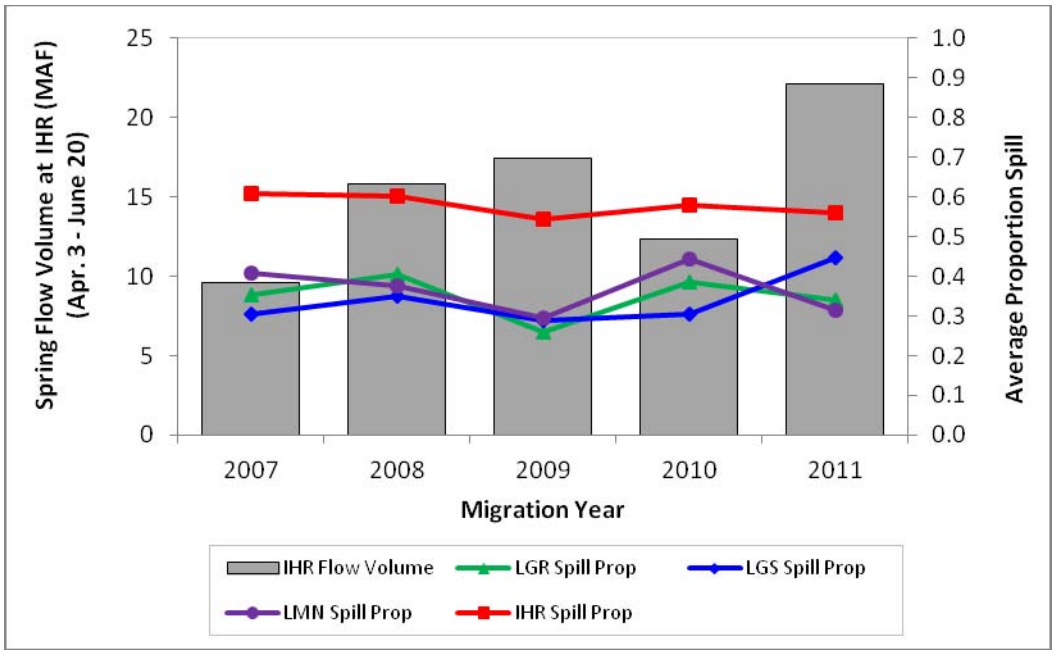

Figure 2. Total spring flow volume in the Snake River (at Ice Harbor Dam) and average spill proportion at Lower Granite, Little Goose, Lower Monumental, and Ice Harbor dams. Spring period in the Snake River is April 3-June 20.

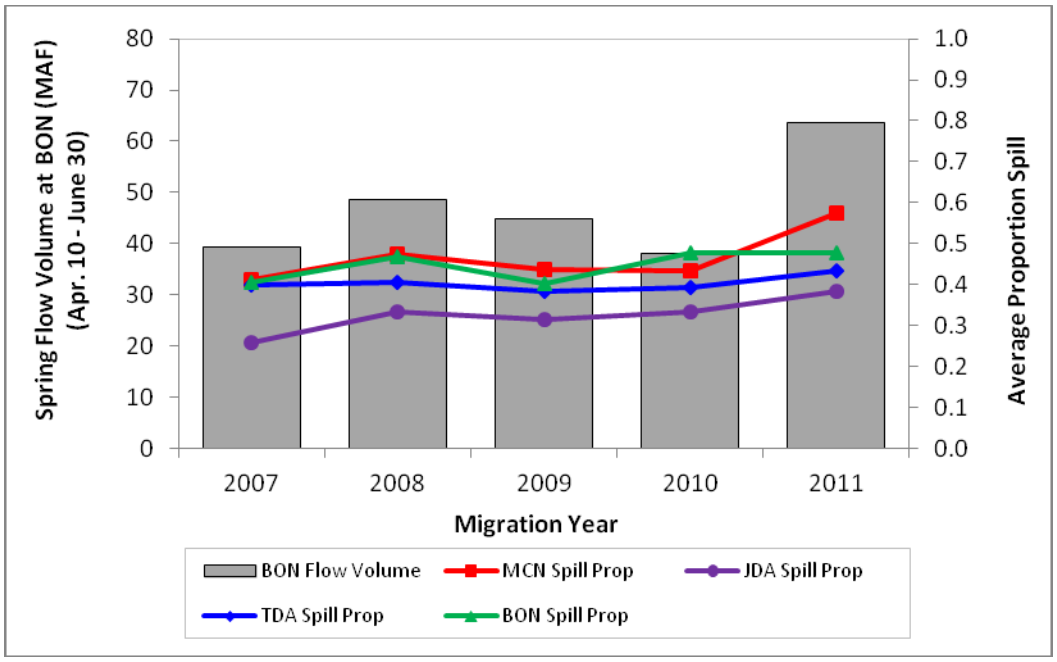

Figure 3. Total spring flow volume in the Lower Columbia River (at Bonneville Dam) and average spill proportion at McNary, John Day, The Dalles, and Bonnevile dams. Spring period in the Lower Columbia River is April 10-June 30.

Finally, the table below contains estimates calculated in the CSS study of juvenile survival in the hydrosystem between Lower Granite and Bonneville Dams and the survival to adulthood of spring Chinook (Table 3) in several categories. Those categories are SAR(T), SAR(C_0), and Weighted $SAR_{LGR\text{-}to\text{-}LGR}$, where SAR(T) represents smolts transported from Lower Granite, Little Goose, or Lower Monumental Dam, SAR(C_0) represents smolts migrating in river (undetected at Snake River transportation collector sites), and $SAR_{LGR\text{-}to\text{-}LGR}$ is a weighted estimate that is obtained by taking the proportion of the total population of smolts (tagged and untagged) at Lower Granite Dam in each study category and multiplying by the respective study category's $SAR_{LGR\text{-}to\text{-}LGR}$. In effect, the weighted $SAR_{LGR\text{-}to\text{-}LGR}$ is the estimated SAR for the overall hatchery release (without jacks). The data presented in Table 3 were taken from the 2011 CSS Annual Report, which can be downloaded from the FPC webpage http://www.fpc.org/documents/CSS.html. Finally, Figure 4 below shows a time series of the Weighted $SAR_{LGR\text{-}to\text{-}LGR}$ over the years of available data for Sawtooth Hatchery spring Chinook.

Table 3. Sawtooth Hatchery spring Chinook survivals from CSS, as presented in the 2011 CSS Annual Report.

Release Date(s)	Migration Year [A]	Juvenile Survival (LGR-BON)	Proportion Transported	T/C Ratio	Adult Survival SAR(T) %	Adult Survival SAR(C_0) %	Adult Survival Weighted $SAR_{LGR\text{-}to\text{-}LGR}$
	2007	0.711	0.454	2.08	0.85	0.41	0.63
	2008	0.559	0.594	1.88	1.23	0.66	1.00
	2009 [B]	0.564	0.388	3.07	0.58	0.19	0.31
	2010 [C]	0.547	0.325	2.29	N/A	N/A	N/A

[A] Smolt migration year 2006 through 2010 use combined TWS and BWS data
[B] Adult returns for migration year 2009 are incomplete with Age 2-salt adult returns through 9/12/2011
[C] No adult returns to date, only juvenile metrics available for estimation.

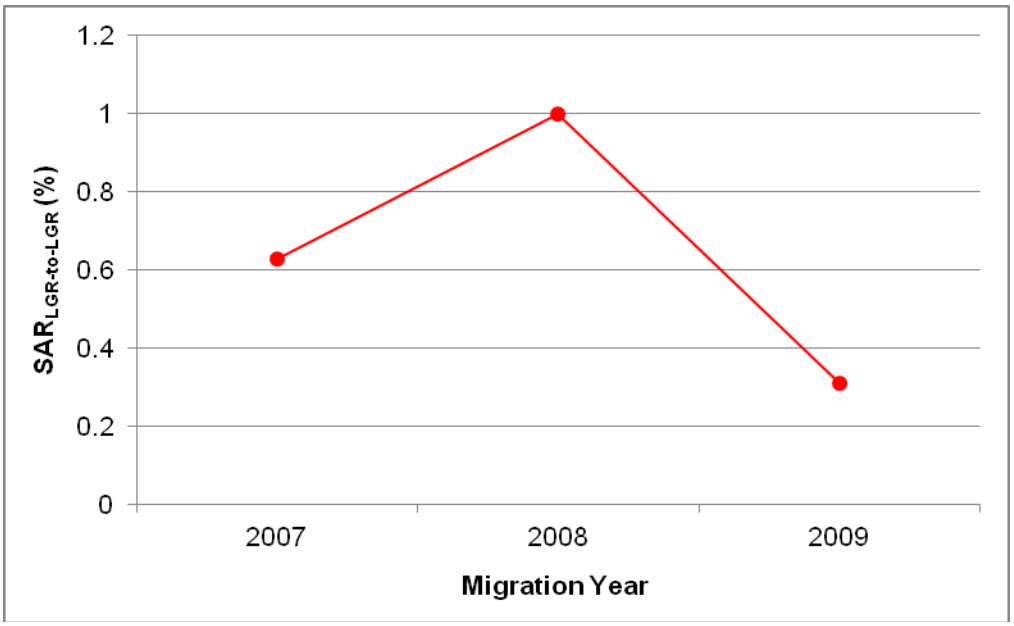

Figure 4. Weighted $SAR_{LGR\text{-}to\text{-}LGR}$ for Sawtooth Hatchery spring Chinook (2007-2009). Adult returns for migration year 2009 are incomplete, with Age 2-salt adult returns through 9/12/2011.

We hope that the information we have provided regarding the use and application of information from the marked groups over the last several years is of some use to you. If you would like any additional information regarding these releases please feel free to contact us.

Sincerely,

Michele DeHart
Fish Passage Center Manager

Cc: Pete Hassemer, IDFG
Brian Leth, IDFG
Bill Tweit, WDFW
Jay Hesse, Nez Perce
Tony Nigro, ODFW
Howard Schaller, USFWS
FPAC