FISH PASSAGE CENTER

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Mr. Ralph Steiner
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Dear Ralph-

The Fish Passage Center has been marking fish from the Rapid River Hatchery facility over the last several years as part of the Smolt Monitoring Program (SMP) and the Comparative Survival Study (CSS). For purposes of these studies data are collected on either juvenile life stage, or both the juvenile and adult life stages. The SMP provides information for in-season management of the hydrosystem and post-season analyses to the federal, state, and tribal fishery agencies. The CSS is a multi-year program that estimates survival rates over different life stages for spring and summer Chinook produced in major hatcheries. We would like to share with you an update of some of the information we developed under these studies for the fish used from the Rapid River Hatchery facility.

Under the Smolt Monitoring Program, information is collected on the timing and migration speed from the hatchery to Lower Granite Dam. 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 from juvenile to adulthood of different passage histories.

Table 1 below provides estimates of minimum, median, and maximum travel times from each year's release to Lower Granite Dam. Also provided are estimates of the 95% confidence limits around the estimated median travel time. In previous year's reports, these travel times have been estimated as the date of arrival at LGR minus the release date. However, since Rapid River Hatchery has a prolonged volitional release, this methodology may produce inaccurate travel times, depending on how quickly the yearling Chinook out-migrate. Given that Rapid River Hatchery has had a PIT-tag detection facility on site since 1999, we are providing new estimates of travel time to LGR for migration years 2000 to 2009. For these years, travel time to LGR is now estimated as the date of arrival at LGR minus the date of detection at the Rapid River Hatchery detection site (RPJ). As in the past, we are providing these estimates of median travel time, as well as minimum, maximum, and 95% confidence limits around the median (Table 1).

Table 1. Rapid River Hatchery Spring Chinook Travel Times to Lower Granite Dam

Release Date	Migration Year	Travel Time (Days) †			95% Confidence Limits	
		Min	Med	Max	Lower	Upper
4/1	1997	1.5	34.9	115.8	34.4	35.4
4/13	1998	n/a	19.5	60	19.5	19.6
4/2, 4/20	1999	1.4	37.1	134.8	36.9	37.2
17-Mar	2000	5.5	30.2	63.1	30.1	30.3
15-Mar	2001	7.6	30.1	79.9	30.1	30.2
18-Mar	2002	4.2	30.7	70.2	30.6	30.9
17-Mar	2003	5.7	32.3	66.0	32.2	32.4
15-Mar	2004	8.3	33.6	68.3	33.5	33.6
15-Mar	2005	8.7	33.6	59.4	33.4	33.8
17-Mar	2006	3.7	26.2	131.7	26.1	26.3
15-Mar	2007	4.5	20.3	66.9	20.2	20.5
3/17,3/19	2008	5.0	25.6	65.0	25.5	25.6
16-Mar	2009	4.0	35.0	72.4	34.6	35.2

† Prior to MY 2000, travel times are based date of release and date of arrival at LGR. For MY 2000 and beyond, travel times are based on date of detection at the Rapid River Hatchery PIT-tag detection site (RPJ) and arrival at LGR.

In past years, we have provided you with figures to illustrate passage timing of Rapid River yearling Chinook to Lower Granite Dam since tagging began in 1997. However, given that Rapid River has been releasing tagged fish for so many years now, these figures have become cumbersome. This year, we have decided to provide a table that presents the estimated 10%, 50%, and 90% passage dates of Rapid River yearling Chinook juveniles at Lower Granite Dam for each of the years of tagging (Table 2). Also, Figure 1 is provided as an illustration of how the arrival timing of the 2009 smolt release relates to last year's release, as well as the average of the most recent 10-years (1999-2008).

Table 2. Estimated 10%, 50%, and 90% passage dates of Rapid River Hatchery yearling Chinook at Lower Granite.

Migration Year	Release Date(s)	10% Passage Date	50% Passage Date	90% Passage Date
1997	1-Apr	24-Apr	7-May	20-May
1998	13-Apr	24-Apr	3-May	10-May
1999	4/2,4/20	26-Apr	9-May	22-May
2000	17-Mar	26-May	4-May	12-May
2001	15-Mar	27-Apr	30-Apr	14-May
2002	18-Mar	18-Apr	4-May	13-May
2003	17-Mar	22-Apr	3-May	16-May
2004	15-Mar	18-Apr	30-Apr	5-May
2005	15-Mar	27-Apr	5-May	9-May
2006	17-Mar	27-Apr	6-May	15-May
2007	15-Mar	28-Apr	4-May	12-May
2008	3/17,3/19	4-May	10-May	18-May
2009	16-Mar	25-Apr	13-May	20-May

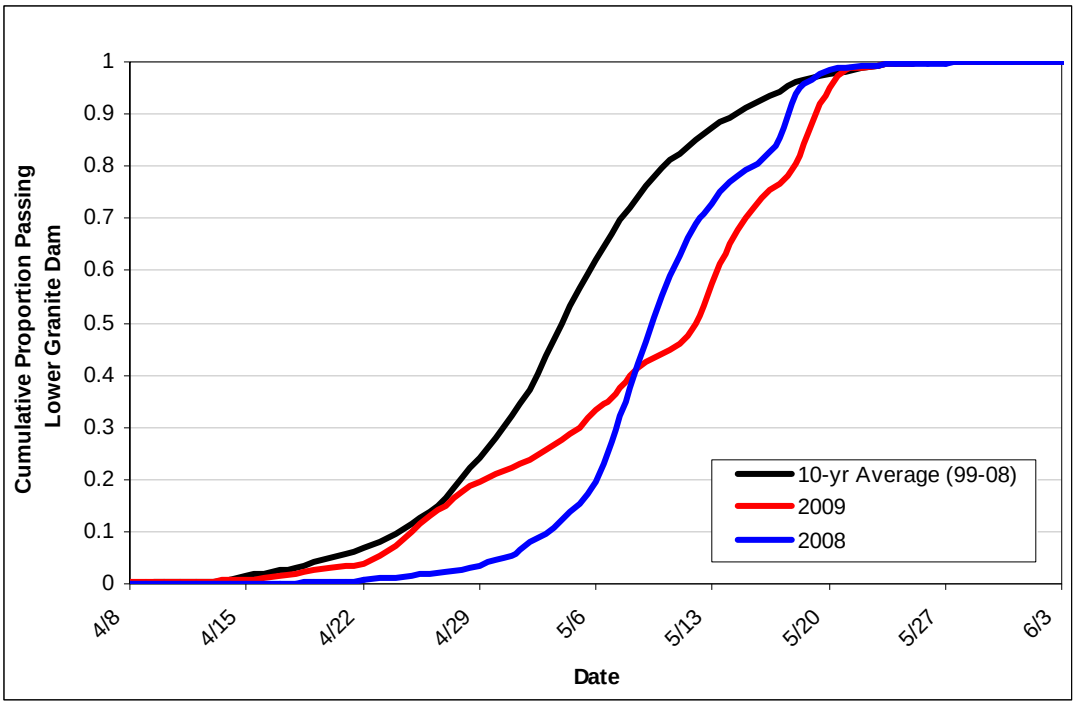

Figure 1. Cumulative passage timing of Rapid River Hatchery yearling Chinook to Lower Granite Dam.

Table 3 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 juvenile salmonids 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, 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. The data presented in Table 3 were taken from the Draft 2009 CSS Annual Report, which can be downloaded from the FPC webpage (http://www.fpc.org/documents/CSS.html). Figure 2 is a time series of the Weighted $SAR_{LGR\text{-}to\text{-}LGR}$ estimates over the eleven years of available data.

Table 3. Rapid River Hatchery Spring Chinook Survivals from CSS

Release Date	Migration Year	Juvenile Survival (LGR-BON)	Proportion Transported	T/C Ratio	Adult Survival SAR(T) %	Adult Survival $SAR(C_0)$ %	Adult Survival Weighted $SAR_{LGR\text{-}to\text{-}LGR}$
4/1	1997	0.33	0.54	1.73	0.79	0.45	0.65
4/13	1998	0.59	0.86	1.66	2.00	1.20	1.88
4/2, 4/20	1999	0.57	0.80	1.28	3.04	2.37	2.91
3/17	2000	0.58	0.68	1.32	2.10	1.59	1.94
3/15	2001	0.33	0.97	21.7	1.08	0.05[B]	1.06
3/18	2002	0.71	0.67	1.50	1.01	0.67	0.90
3/17	2003	0.66	0.55	1.07	0.25	0.23	0.24
3/15	2004	0.35	0.89	1.57	0.36	0.23	0.34
3/15	2005	0.54	0.87	2.36	0.27	0.12[C]	0.25
3/17	2006[D]	0.55	0.75	1.37	0.58	0.42	0.53
3/15	2007 [A D]	0.63	0.41	1.84	0.54	0.37	0.33

[A] Migration year 2007 is incomplete with Age 2-salt adult returns through 8/3/2009
[B] Assumed $SAR(C_0)$ same as $SAR(C_1)$ for 2001
[C] In-river SAR is combination of groups C_1 and C_0
[D] Smolt migration year 2006 and 2007 use combined TWS and BWS data

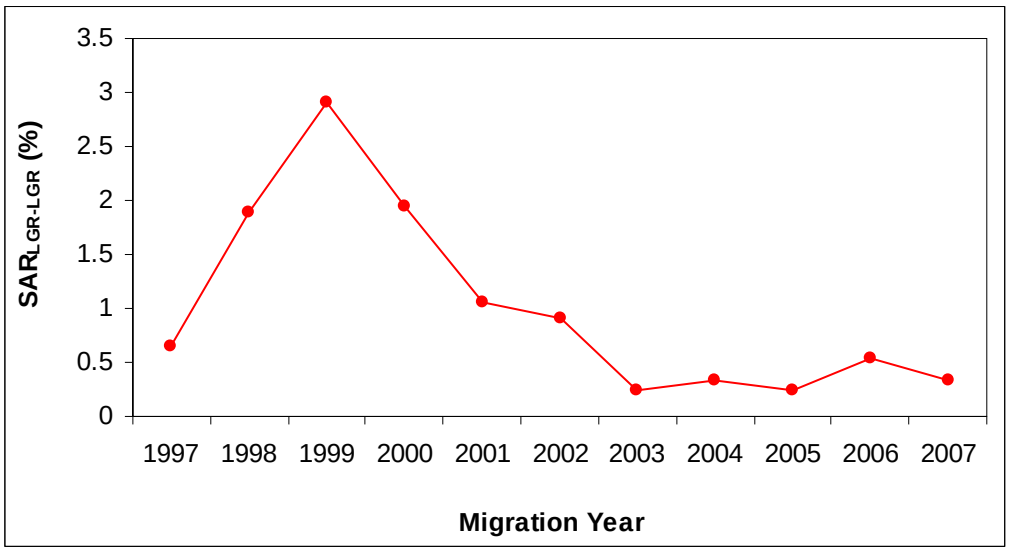

Figure 2. Weighted $SAR_{LGR\text{-}to\text{-}LGR}$ for Rapid River Hatchery spring Chinook releases over the past 11 years (1997-2007). Migration year 2007 is incomplete with Age 2-salt adult returns through 8/3/2009.

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

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