



FISH PASSAGE CENTER

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MEMORANDUM

TO: Kathryn Brigham (CTUIR)

FROM: Michele DeHart

DATE: April 14, 2011

RE: Juvenile migration success of spring Chinook adults that are returning in 2011

In response to your request, to describe the juvenile outmigration success for spring Chinook returning as adults in the spring of 2011, the Fish Passage Center staff have summarized annual juvenile survival estimates from past out-migration years for Snake River yearling Chinook. The out-migration years that would contribute to the 2011 returns of adult spring Chinook to Bonneville Dam (BON) migrated downstream to the ocean in 2007, 2008, 2009 and 2010. For this summary we relied on the 2010 version of an annual memo that NOAA Fisheries produces each year, which provides seasonal juvenile survival estimates for Snake River yearling Chinook (Ferguson 2010). This NOAA report is entitled: Preliminary survival estimates for passage during the spring migration of juvenile salmonids through Snake and Columbia River reservoirs and dams, 2010. The report includes estimates of survival from out-migration year 1997 to 2010. Below is a table of the reach survival estimates for Lower Granite to McNary and Lower Granite to Bonneville (LGR-MCN and LGR-BON) for yearling Snake River Chinook from this NOAA report (Table 1). In the following Table 1, we have ranked the reach survivals, reported by NOAA, numerically with the number 1 assigned to the highest survival in the data time series. The years in the survival data time series that are contributing to the 2011 adult return are shaded in Table 1.

The 2011 spring Chinook adult returns will likely be composed of juveniles that outmigrated in 2007 through 2010. These years are shaded in Table 1. Historical data from the Comparative Survival Study indicate that 62-78% of the PIT-tagged Snake River spring Chinook

adult return is comprised of 2-salts while 1-29% is comprised of 3-salts (Tuomikoski et al., 2010: Appendix D). For the 2011 adult return, 2-salts would be juveniles that out-migrated in 2009 and 3-salts would be juveniles that out-migrated in 2008. The LGR-MCN survival estimates for migration years 2007 through 2010 rank among the top 5 of all the years in the NOAA analysis (Table 1). The only year with a higher rank for the LGR-MCN reach survival was 1999, with a survival of 0.792.

The LGR-BON survival estimates for migration years 2007 through 2010 had a different pattern. Only two of these years (2007 and 2010) were ranked in the top 5 for LGR-BON survival. Migration year 2009 was the 7th highest survival estimate for the LGR-BON reach and 2008 was the 10th highest survival estimate for the LGR-BON reach. Among the years in the NOAA analysis, migration year 2006 had the highest LGR-BON survival estimate, at 0.643. It is important to note that the estimation of survival in the MCN-BON is often difficult and can have a high level of uncertainty. Therefore, estimates for this reach should be interpreted with caution, particularly for migration year 2008¹.

For those migration years that are expected to contribute to the 2011 adult return, there were notable events in river operations that may have impacted juvenile survivals and/or impacted the estimation of juvenile survival.

2007

- Two Temporary Spillway Weirs (TSW) installed at McNary Dam (MCN) into spill bays 22 and 20

2008

- Removable Spillway Weirs (RSW) installed at Lower Monumental Dam (LMN)
- MCN TSWs moved to spill bays 19 and 20
- Two TSWs installed at John Day Dam
 - TSW testing at John Day Dam resulted in an unanticipated increase in tailrace morality as a result of TSW operation. It is believed that the TSW concentrated juveniles passing over the TSW at the surface in the tailrace resulting in an increase in tailrace mortality by bird predation¹.
- The U.S. Army Corps of Engineers (COE) removed the screens at Bonneville Dam on May 13 and 14 and then again on May 17 to 21, due to high levels of debris. Due to continued debris loads, the Technical Management Team decided that STS screens should be pulled from PH2 turbine units until debris loads decreased. On May 22, the COE began pulling STS screens at BON PH2, all screens were pulled soon thereafter. The STS screens remained out until June 20, 2008¹. This increased turbine passage at Bonneville and decreased the ability to estimate survival.

2009

- One TSW installed at Little Goose Dam

¹ For more detail on the impacts of the JDA TSW testing and removal of STS screen at BON on reach survival estimates, see the 2008 Fish Passage Annual Report (Smolt Monitoring Section, pages 77-85). This report can be downloaded at: http://www.fpc.org/documents/annual_FPC_report/FPC%202008%20Annual%20Report--Final.pdf.

- MCN TSWs moved to spill bays 4 and 20
- JDA TSWs moved to bays 15 and 16. TSWs were not operated in summer.

2010

- MCN TSWs moved to spill bays 19 and 20
- JDA TSWs moved to bays 18 and 19. As in 2009, the TSWs were not operated in summer.

Table 1. Seasonal survival estimates for Snake River yearling Chinook salmon (hatchery and wild combined), 1997-2010. Standard errors are in parentheses. Data from 2010 NOAA report.

Migration Year	LGR-MCN	LGR-MCN Rank	LGR-BON	LGR-BON Rank
1997	0.653 (0.072)	13	N/A	N/A
1998	0.770 (0.009)	6	N/A	N/A
1999	0.792 (0.006)	1	0.557 (0.046)	6
2000	0.760 (0.012)	8	0.486 (0.093)	9
2001	0.556 (0.009)	14	0.279 (0.016)	12
2002	0.757 (0.009)	9	0.578 (0.060)	3
2003	0.731 (0.010)	11	0.532 (0.023)	8
2004	0.666 (0.011)	12	0.395 (0.050)	11
2005	0.732 (0.009)	10	0.577 (0.068)	4
2006	0.764 (0.007)	7	0.643 (0.017)	1
2007	0.783 (0.006)	3	0.597 (0.035)	2
2008	0.782 (0.011)	4	0.465 (0.052)	10
2009	0.787 (0.007)	2	0.555 (0.025)	7
2010	0.772 (0.012)	5	0.570 (0.031)	5

Literature Cited:

Ferguson, J.W. 2010. Preliminary survival estimates for passage during the spring migration of juvenile salmonids through the Snake and Columbia River reservoirs and dams, 2010. September 13, 2010 draft.

Tuomikoski, J., J. McCann, T. Berggren, H. Schaller, P. Wilson, S. Haeseker, J. Fryer, C. Petrosky, E. Tinus, T. Dalton, and R. Ehlke. 2010. Comparative Survival Study (CSS) of PIT-tagged Spring/Summer Chinook and Summer Steelhead, 2010 Annual Report, Project No. 1996-020-00. <http://www.fpc.org/documents/CSS/CSSDRAFTRPT2010.pdf>



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DATA REQUEST FORM

Request Taken By: Michele Date: 4-13-2011

Data Requested By:
Name: KAT BRIGHAM Phone: X
Address: CTUIR Fax: _____
Email: _____

Data Requested:

Juvenile migration success of the
spring chinook adults/ returning
in 2011 -

Data Format: Hardcopy Text Excel
Delivery: Mail Email Fax Phone

Comments:

Compile juvenile spring chinook
travel time and survival for the outmigration
years comprising this return (2011)

Data Compiled By: BRANDON Date: _____

Request # 34

note - make sure to include events in each year that could affect the data - ie...

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example - pulling screens @ BONN in 08 -