



FISH PASSAGE CENTER

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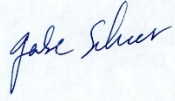
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MEMORANDUM

TO: Brent Snider, IDFG



FROM: Gabe Scheer

DATE: June 13, 2018

RE: 2017 McCall Hatchery Report

The Fish Passage Center has been marking Chinook from the McCall Hatchery facility over the last several years as part of the Comparative Survival Study (CSS). 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 the CSS for the Chinook used from the McCall Hatchery facility in 2017 as well as past years.

With the marking efforts over the past several years, data on the timing and migration speed from release to Lower Granite Dam are also 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 time from each year's release of summer Chinook from McCall Hatchery to Lower Granite Dam. Also provided are estimates of the 95% confidence limits around the estimated median travel time.

Table 1. McCall Hatchery Summer Chinook Travel Times to Lower Granite Dam

Release Date	Migration Year	Travel Time (Days)			Confidence Limits 95%	
		Min	Med	Max	Lower	Upper
20-Mar	1997	9.9	49.4	100.2	49.1	49.7
30-Mar	1998	14.4	36.5	109.7	36.4	36.5
6-Apr	1999	13.8	39.9	129.0	39.7	40.5
5-Apr	2000	11.3	34.1	114.0	34.0	34.2
26-Mar	2001	24.2	48.5	114.8	48.2	48.6
25-Mar	2002	20.2	51.3	82.5	51.0	51.5
31-Mar	2003	12.4	42.0	101.3	41.9	42.1
22-Mar	2004	16.4	43.5	96.1	43.4	43.6
18-Mar	2005	24.4	49.4	93.1	49.4	49.5
21-Mar	2006	17.5	46.1	76.0	45.9	46.3
19-Mar	2007	20.0	47.0	71.8	46.8	47.2
17-Mar	2008	32.9	54.7	100.5	54.5	54.9
24-Mar	2009	17.1	50.1	92.8	49.9	50.4
23-Mar	2010	29.5	49.5	89.4	48.9	50.4
3/22,3/24	2011	14.5	50.2	117.4	50.0	50.3
3/19-3/21	2012	12.9	41.4	86.1	40.9	41.8
3/25-3/28	2013	16.6	44.6	150.1	44.6	44.7
3/31	2014	12.6	36.5	78.4	36.4	36.5
4/1-4/2	2015	16.6	36.6	67.4	36.5	36.9
4/4-4/5	2016	8.0	32.1	64.8	32.0	32.3
4/3-4/4	2017	6.9	32.3	64.4	32.2	32.5

As with previous years, we are providing a table that presents the estimated 10%, 50%, and 90% passage dates of McCall yearling summer 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 2017 smolt release compared to last year's release, as well as the average of the most recent 10 years (2007–2016).

Table 2. Estimated 10%, 50%, and 90% passage dates of McCall Hatchery yearling summer Chinook at Lower Granite Dam.

Migration Year	Release Date(s)	10% Passage Date	50% Passage Date	90% Passage Date
1997	20-Mar	27-Apr	10-May	16-May
1998	30-Mar	28-Apr	6-May	14-May
1999	6-Apr	2-May	16-May	26-May
2000	5-Apr	1-May	9-May	22-May
2001	26-Mar	30-Apr	13-May	17-May
2002	25-Mar	3-May	15-May	21-May
2003	31-Mar	27-Apr	12-May	20-May
2004	22-Mar	27-Apr	4-May	10-May
2005	18-Mar	29-Apr	7-May	12-May
2006	21-Mar	26-Apr	6-May	16-May
2007	19-Mar	25-Apr	5-May	15-May
2008	17-Mar	5-May	11-May	20-May
2009	24-Mar	26-Apr	13-May	21-May
2010	23-Mar	29-Apr	11-May	22-May
2011	3/22, 3/24	6-May	13-May	18-May
2012	3/19-3/21	25-Apr	28-Apr	14-May
2013	3/25-3/26	4-May	9-May	13-May
2014	3/31	26-Apr	6-May	17-May
2015	4/1-4/2	3-May	8-May	15-May
2016	4/4-4/5	26-Apr	7-May	11-May
2017	4/3	28-Apr	5-May	12-May

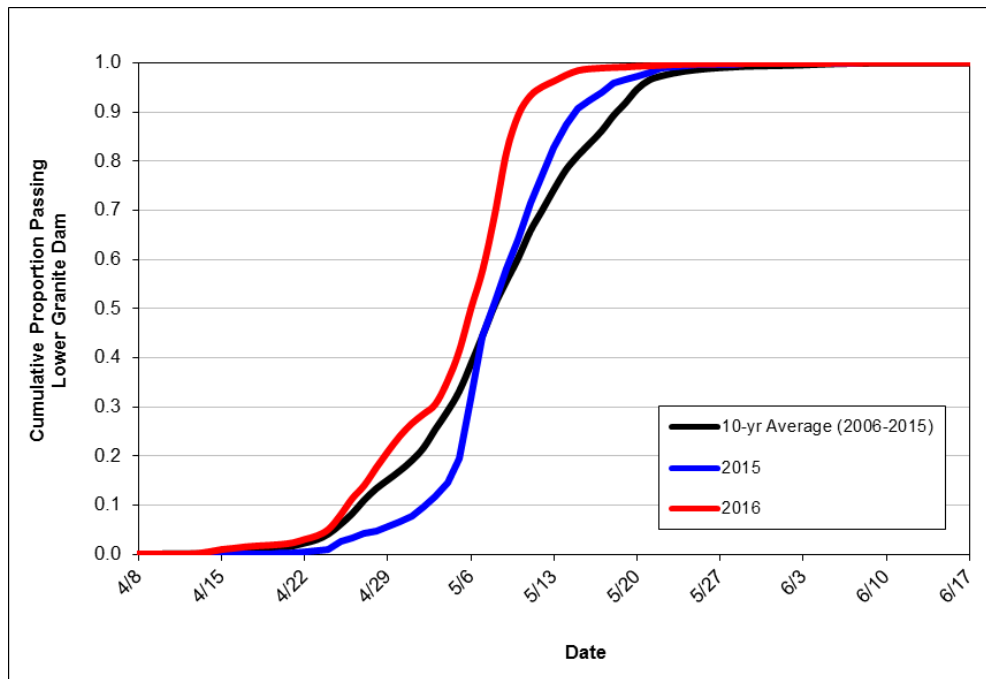


Figure 1. Cumulative passage timing of McCall Hatchery yearling summer Chinook to Lower Granite Dam.

Figures 2 and 3 are provided below to put into context out-migration conditions that these spring migrants may have experienced over the years. Figure 2 provides the total spring flow volume (April 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 (April 10–June 30) for the Middle 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.

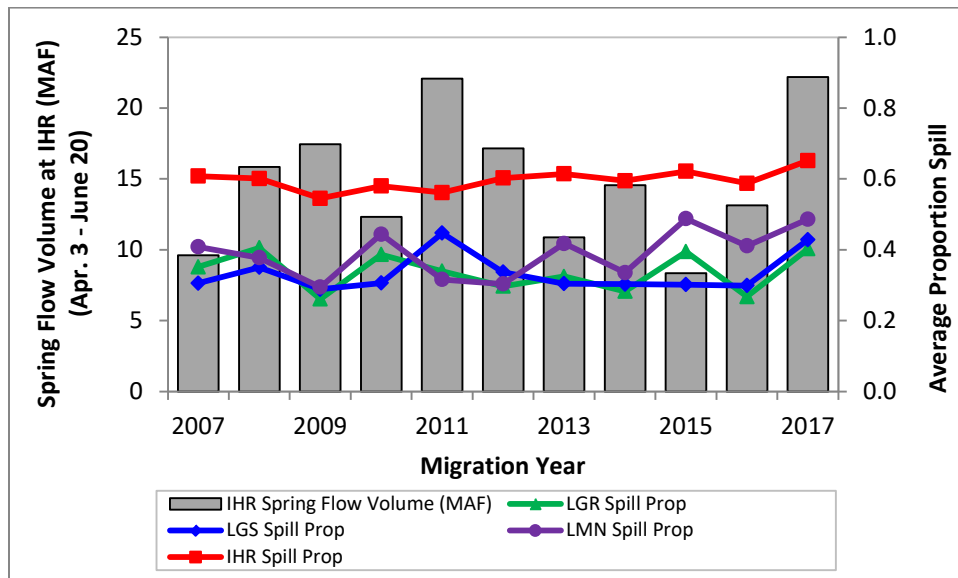


Figure 2. Total spring flow volume in the Snake River (at Ice Harbor Dam) and average spill proportion at Lower Granite, Little Goose, Lower Monumental, and Ice Harbor dams. Spring period in the Snake River is April 3–June 20.

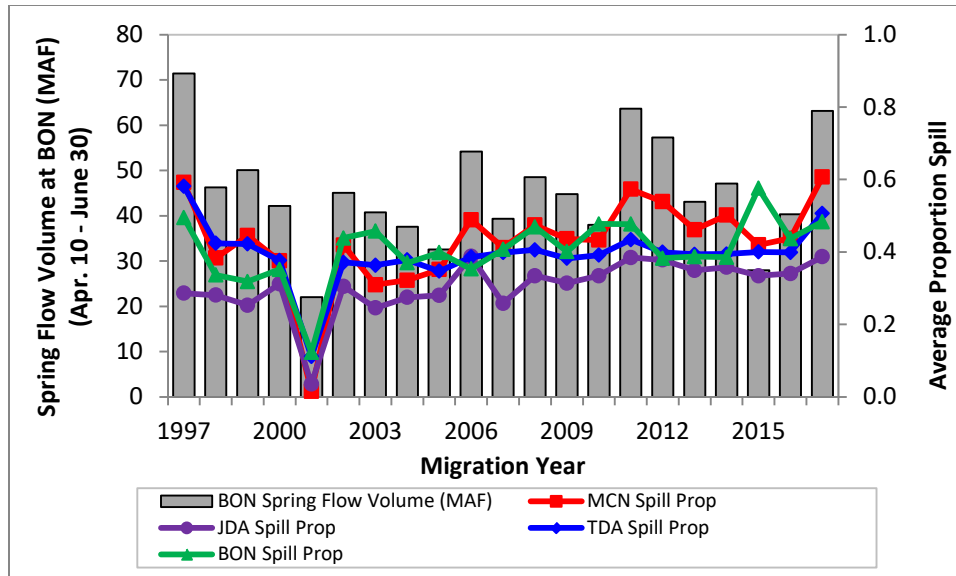


Figure 3. Total spring flow volume in the Middle Columbia River (at Bonneville Dam) and average spill proportion at McNary, John Day, The Dalles, and Bonneville dams. Spring period in the Lower Columbia River is April 10–June 30.

Finally, Tables 3 and 4 contain estimates calculated for McCall Hatchery Chinook by the CSS. The estimates provided include: (1) juvenile survival in the hydrosystem between Lower Granite and Bonneville Dams (Table 3), (2) the proportion of the juvenile population destined for transportation (Table 3), and (3) the smolt-to-adult survival (SAR) for several passage categories (Table 4). Those passage categories are SAR(T), SAR(C₀), and Overall SAR, where SAR(T) represents smolts transported from Lower Granite, Little Goose, or Lower Monumental Dam, SAR(C₀) represents smolts migrating in-river (undetected at Snake River transportation collector sites), and the Overall SAR is the estimated SAR for the overall hatchery release. All SAR estimates are for the LGR-to-GRA reach with jacks excluded. The data presented in Tables 3 and 4 were taken from various chapters and appendices of the 2017 CSS Annual Report, and previous reports, which can be downloaded from the FPC webpage www.fpc.org/documents/CSS.html. Figure 4 below is a time series of the Overall SAR over the nineteen years of available data from McCall Hatchery.

Table 3. McCall Hatchery summer Chinook juvenile survivals and estimated proportion transported (with 90% confidence intervals) from CSS.

Release Date	Migration Year^A	Juvenile Survival (LGR-BON)	Proportion Transported^B
20-Mar	1997	0.43 (0.32-0.59)	0.51
30-Mar	1998	0.56 (0.50-0.64)	0.86
6-Apr	1999	0.52 (0.46-0.61)	0.73
5-Apr	2000	0.61 (0.51-0.83)	0.58
26-Mar	2001	0.27 (0.22-0.34)	0.97
25-Mar	2002	0.58 (0.51-0.68)	0.68
31-Mar	2003	0.70 (0.62-0.77)	0.54
22-Mar	2004	0.44 (0.35-0.59)	0.93
18-Mar	2005	0.53 (0.45-0.65)	0.86
21-Mar	2006	0.60 (0.54-0.67)	0.65 (0.64-0.66)
19-Mar	2007	0.82 (0.73-0.92)	0.27 (0.27-0.28)
17-Mar	2008	0.50 (0.45-0.57)	0.52 (0.51-0.53)
24-Mar	2009	0.57 (0.50-0.67)	0.40 (0.39-0.41)
23-Mar	2010	0.59 (0.53-0.66)	0.28 (0.27-0.29)
3/22, 3/24	2011	0.57 (0.50-0.65)	0.43 (0.42-0.44)
3/19-3/21	2012	0.79 (0.73-0.85)	0.32 (0.32-0.33)
3/25-3/26	2013	0.92 (0.80-1.01)	0.35 (0.34-0.35)
31-Mar	2014	0.67 (0.61-0.73)	0.44 (0.43-0.45)
4/1-4/2	2015	0.54 (0.47-0.64)	0.06 (0.05-0.06)
4/4	2016	0.49 (0.42-0.58)	0.47 (0.46-0.48)

^A Estimates for migration years 2006 through 2016 reflect use of new methodology developed for random pre-assignment of “monitor mode” and “return-to-river mode” operations. See 2017 CSS Annual Report for details.

^B Confidence interval for proportion transported not available for migration years 1997-2005.

Table 4. McCall Hatchery summer Chinook TIR, SAR by study category (T vs. C₀), and Overall SARs (with 90% confidence intervals). SAR estimates are for LGR-to-GRA reach and are without jacks.

Release Date	Migration Year	TIR	SAR(T) %	SAR(C ₀) %	Overall SAR (%)
20-Mar	1997	1.38 (1.06-1.80)	1.51 (1.26-1.77)	1.09 (0.88-1.34)	1.31 (1.15-1.46)
30-Mar	1998	1.96 (1.54-2.56)	2.69 (2.44-2.96)	1.38 (1.05-1.69)	2.50 (2.28-2.73)
6-Apr	1999	1.49 (1.29-1.73)	3.59 (3.29-3.87)	2.40 (2.12-2.69)	3.26 (3.02-3.49)
5-Apr	2000	1.89 (1.67-2.15)	3.88 (3.60-4.18)	2.06 (1.84-2.29)	3.12 (2.92-3.33)
26-Mar	2001	31.9 (17.9-88.4)	1.24 (1.10-1.38)	0.04 ^A (0.01-0.07)	1.20 (1.07-1.34)
25-Mar	2002	1.44 (1.18-1.79)	1.48 (1.27-1.70)	1.03 (0.87-1.20)	1.34 (1.18-1.49)
31-Mar	2003	1.47 (1.18-1.83)	0.79 (0.68-0.92)	0.54 (0.45-0.62)	0.68 (0.60-0.76)
22-Mar	2004	1.59 (0.87-4.37)	0.40 (0.34-0.48)	0.25 (0.09-0.44)	0.39 (0.33-0.46)
18-Mar	2005	3.02 (2.32-4.12)	0.62 (0.54-0.71)	0.20 ^B (0.16-0.26)	0.57 (0.50-0.64)
21-Mar	2006 ^C	1.11 (0.90-1.38)	1.15 (1.01-1.30)	1.04 (0.85-1.22)	1.06 (0.95-1.18)
19-Mar	2007 ^C	2.09 (1.63-2.65)	1.48 (1.20-1.75)	0.71 (0.60-0.82)	0.90 (0.78-1.01)
17-Mar	2008 ^C	1.54 (1.26-1.94)	1.35 (1.17-1.54)	0.88 (0.73-1.03)	1.14 (1.02-1.26)
24-Mar	2009 ^C	2.00 (1.45-2.71)	0.76 (0.60-0.94)	0.38 (0.30-0.47)	0.52 (0.44-0.61)
23-Mar	2010 ^C	1.37 (1.01-1.84)	0.71 (0.54-0.91)	0.52 (0.44-0.61)	0.58 (0.49-0.67)
3/22, 3/24	2011 ^C	1.43 (0.94-2.25)	0.33 (0.24-0.43)	0.23 (0.17-0.31)	0.31 (0.25-0.38)
3/19-3/21	2012 ^C	1.11 (0.79-1.48)	0.69 (0.52-0.86)	0.63 (0.51-0.76)	0.59 (0.51-0.68)
3/25-3/26	2013 ^C	1.01 (0.81-1.28)	0.89 (0.73-1.07)	0.89 (0.78-0.99)	0.89 (0.79-0.99)
31-Mar	2014 ^{C,D}	1.60 (1.19-2.22)	0.55 (0.43-0.66)	0.34 (0.27-0.42)	0.42 (0.35-0.49)
4/1-4/2	2015	3.85 (2.18-6.40)	0.33 (0.20-0.46)	0.09 (0.06-0.12)	0.14 (0.10-0.18)

^A Assumed SAR(C₀) same as SAR(C₁) for 2001.

^B In-river SAR is combination of groups C₁ and C₀.

^C Estimates for migration years 2006 through 2015 reflect use of new methodology developed for random pre-assignment of “monitor mode” and “return-to-river mode” operations. See 2017 CSS Annual Report for details.

^D Migration year 2015 is incomplete with Age 2-salt adult returns through 7/22/2017.

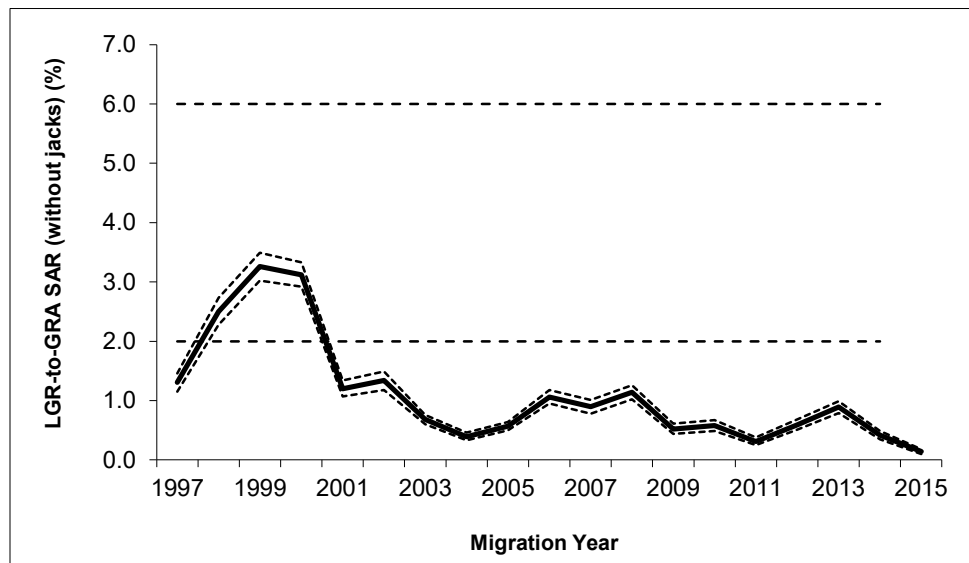


Figure 4. Overall SAR_{LGR-to-GRA} (without jacks) for McCall Hatchery summer Chinook releases (with 90% confidence intervals). The 2014 NPCC 2-6% SAR objective for listed wild populations are shown for reference. Migration year 2015 is incomplete with Age 2-salt adult returns through 7/22/2017.

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.