



FISH PASSAGE CENTER

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MEMORANDUM

TO: Tom Lorz, CRITFC
FPAC

Michele DeHart

FROM: Michele DeHart

DATE: April 22, 2013

RE: Summer spill initiation under 2008 BiOp and subyearling fall Chinook timing at LMN.

Under RPA Number 29 of the 2008 BiOp, summer spill at Snake River Projects would be initiated when subyearling Chinook collections exceeded 50% of the total collection for a 3-day period, after June 1st. The COE intends to implement summer spill levels earlier this year for performance testing. They contend that this is acceptable since the 2008 BiOp calls for an earlier initiation of summer spill. At the April 15, 2013 FPAC meeting, you and other members of FPAC raised several questions about the COE's intended operation. Among the concerns that were raised were: 1) in past years, what would the date of initiation of summer spill have been if the 2008 BIOP had been implemented, 2) how much is the initiation date affected by the large releases of hatchery subyearling Chinook migrants in May, and 3) what spring migrating stocks are present during this reduced spill period?

In response to your request, the FPC staff has summarized subyearling Chinook passage at Lower Monumental Dam (LMN) over the past 10-years (2003-2012) to determine what the date for the initiation of summer spill would have been, if the project were operated under the provisions of the 2008 BiOp. The FPC staff also reviewed hatchery release data and PIT-tag data to investigate to what degree hatchery releases of subyearling fall Chinook may influence the date of initiation of summer spill and to what degree the earlier start date may effect yearling spring/summer Chinook. Below, is a brief summary of our findings from this analysis followed by a more detailed discussion.

- Based on the criteria outlined in RPA Number 29, the initiation date for summer spill at LMN ranged from June 4th to June 12th over the last 10 years (2003-2012). Over these 10 years, the average date for the initiation of summer spill was June 7th.

- Based on the 10 years we analyzed, implementation of RPA 29 would have resulted in 9-17 additional days (14 days on average) of reduced spill at LMN, when compared to the current Court Ordered date of June 21st.
- From 2003-2012, an average of 82% (range: 69-99%) of all hatchery subyearling fall Chinook that were released above LMN were released prior to the estimated date of initiation of summer spill.
- Based on preliminary release data for 2013, an estimated 91% of hatchery subyearling fall Chinook that are scheduled for release above LMN are scheduled for release prior to the average summer spill initiation date of June 7th.
- Based on PIT-tag data, it appears that the earliest subyearling Chinook arriving at LMN are of hatchery origin. This indicates that the date of initiation of summer spill is likely influenced by release schedules at the hatcheries and acclimation ponds above LMN.
- Based on PIT-tag data, it appears that an earlier start date for the initiation of summer spill would have a disproportionate impact on wild yearling spring/summer Chinook. This was particularly evident in the low flow year (e.g., 2010) we analyzed.
- Based on past analyses documenting the importance of spill in juvenile reach survivals, we find no biological basis for reducing summer spill volumes for summer migrants. Furthermore, the analyses of PIT-tag timing indicate that moving these reductions to an earlier date in June would impact wild yearling spring/summer Chinook, particularly those from the Clearwater River.

Background:

Prior to the Court ordered summer spill program in 2005, spill ended after the spring period on June 20th at all the transportation collector projects in the Snake River. In 2005, the Court Order required summer spill to the gas cap at all the Snake River projects, beginning on June 21st and continuing through August 31st. Subsequent to the 2005 Court Order, the 2008 BiOp modified the summer spill dates under RPA Number 29. If the 2008 BIOP were implemented the summer spill at Snake River Projects would be initiated when subyearling Chinook collections exceeded 50% of the total collection for a 3-day period, after June 1st. When the 2008 BiOp was first released, considerable concern was raised regarding the earlier summer spill initiation. Among the highest concerns was the fact that the summer spill volumes at Lower Granite Dam and Lower Monumental Dam constitute reductions in spill, which would be implemented earlier in June when spring migrants continue to pass the Snake River projects. The reduction at LMN is significant, as spring spill is to the gas cap (generally 27-35 Kcfs) while summer spill is 17 Kcfs. Since the 2008 BiOp is currently in remand, the FCRPS system continues to operate under the Court Order and the spring/summer transition date of June 20th has remained in place.

Initiation of Summer Spill:

Under RPA Number 29 of the 2008 BiOp, summer spill at Snake River Projects would be initiated when subyearling Chinook collections exceeded 50% of the total collection for a 3-day period, after June 1st. Based on this criteria in RPA Number 29, the earliest possible date for summer spill initiation is June 4th. The FPC staff used collection counts from the Smolt Monitoring Program at LMN to determine what the summer spill initiation date would have been over the past 10 years (2003-2012).

Over the past 10 years, the initiation date for summer spill at LMN ranged from June 4th to June 12th (Table 1). The average initiation date, among the 10 years we analyzed, was June 7th (Table 1). Based on this analysis, implementation of RPA 29 would have resulted in 9-17 additional days (14 days on average) of reduced spill at LMN, when compared to the current Court Ordered transition date of June 21st.

Hatchery Releases of Subyearling fall Chinook:

The FPC staff reviewed hatchery release data for subyearling fall Chinook releases above LMN over the past 10 years (2003-2012). Since LMN is located below Lyons Ferry Hatchery, direct releases of subyearling Chinook at Lyons Ferry Hatchery were included in these analyses. Release totals for these years can be found in Table 1. We also estimated the percent of the subyearling fall Chinook release total that was released prior to the initiation of summer spill, based on the estimated dates from the above analysis (Table 1). Over the 10 years we analyzed, this percentage ranged from 69% to 99% (Table 1). The average percentage was 82% (Table 1).

Based on preliminary release data for 2013, and the average summer spill initiation date of June 7th, we estimate that approximately 91% of subyearling fall Chinook that are scheduled to be released above LMN in 2013 will be released prior to the initiation of summer spill. This would indicate that the releases of hatchery subyearling fall Chinook may influence the proportion of the total collection at LMN and, therefore, is likely a driving force towards making the date of initiation of summer spill earlier.

Table 1. Estimated date of initiation of summer spill at LMN, based on SMP collection counts and RPA Number 29 of 2008 BiOp. Hatchery release totals for subyearling fall Chinook released above LMN and the estimated proportion of subyearling hatchery fall Chinook that were released prior to the initiation of summer spill at LMN.

Migration Year	LMN Summer Spill Initiation Date	Hatchery Release Total	Percent of Hatchery Fall Chinook Released Prior to Initiation Date
2003	7-Jun	3,081,767	84%
2004	11-Jun	1,718,540	88%
2005	6-Jun	4,164,288	99%
2006	4-Jun	4,089,247	69%
2007	10-Jun	2,453,017	79%
2008	9-Jun	4,318,390	81%
2009	4-Jun	5,308,822	79%
2010	12-Jun	4,815,757	94%
2011	4-Jun	5,122,091	74%
2012	7-Jun	5,090,475	79%
2013	N/A	4,445,000 ^A	91% ^B
Average ('03-'12)	7-Jun		82%

^A Release total for 2013 is based on preliminary estimates and is subject to change as season progresses.

^B Estimated percent of hatchery subyearling Chinook released in 2013 prior to initiation of summer spill is based on average initiation date of June 7th and preliminary release dates. Release dates for 2013 released are subject to change.

PIT-tag Timing of Snake River yearling spring/summer Chinook and subyearling fall Chinook:

The FPC staff reviewed juvenile PIT-tag detections at LMN to investigate to what degree early hatchery subyearling fall Chinook may influence the date of initiation of summer spill and to what degree the earlier start date may effect yearling spring/summer Chinook. We did this for five years of PIT-tag detections (2008-2012). For this analysis, PIT-tagged Chinook were categorized by the basin they originated from (e.g., Salmon River, Clearwater River, Grande Ronde River, etc.), whether they were identified as being of hatchery or wild origin, and whether they were released as yearlings or subyearlings. In general, Chinook from the Snake River Basin that out-migrate as yearlings are spring/summer Chinook, whereas those that out-migrate as subyearlings are fall Chinook. Chinook that were tagged and released at LGR were not included in these analyses, nor were Chinook that were part of acoustic-tag studies. Finally, detections of fall Chinook holdovers were removed from the analysis, as these fish were released as subyearlings but detected the following year as yearlings. We then summarized the juvenile PIT-tag detections at LMN to determine the passage timing of the various PIT-tag groups. To account for daily fluctuations in operations, and therefore detection probabilities, daily PIT-tag detections were expanded for the daily proportion of water that was routed through the powerhouse.

These PIT-tag analyses indicate that the earlier start date for the initiation of summer spill would have an impact on some groups of yearling spring/summer Chinook (Table 2). Overall, it appears that wild yearling spring/summer Chinook would have been impacted the most by the earlier reduction in spill, as many of the wild groups had >5% passage after the initiation of summer spill (Table 2). For example, 5.6-15.8% of wild spring/summer yearling Chinook from the Clearwater River were detected at LMN after the initiation of summer spill (Table 2). These results indicate that an earlier reduction in spill at LMN may lead to a disproportionate impact on certain runs of spring/summer yearling Chinook.

Of all the years we analyzed, 2010 had the lowest flows. These low flows likely resulted in later migration timing for yearling Chinook in the Snake River Basin. Although this late timing may have contributed to the later date for the initiation of summer spill (June 12th), it also seemed to have a larger impact on more of the wild yearling spring/summer Chinook stocks. For example, three of the five wild stocks had greater than 5% passing LMN after the initiation of summer spill in 2010.

Table 2. Proportion of PIT-tagged juvenile yearling spring/summer Chinook detected at LMN after the estimated date of initiation of summer spill (2008-2012).

PIT-Tag Group	Percent Detected After the Initiation of Summer Spill				
	MY 2012	MY 2011	MY 2010	MY 2009	MY 2008
Clearwater Hatchery	0.13%	1.08%	1.67%	1.11%	2.26%
Clearwater Wild	12.32%	15.79%	15.46%	7.90%	5.59%
Grande Ronde Hatchery	0.00%	2.93%	1.37%	0.86%	0.48%
Grande Ronde Wild	1.10%	8.62%	7.64%	2.57%	6.10%
Imnaha Hatchery	0.00%	0.00%	0.21%	0.07%	0.00%
Imnaha Wild	0.83%	1.10%	2.97%	1.89%	0.39%
Salmon Hatchery	0.04%	0.26%	0.40%	0.17%	0.29%
Salmon Wild	0.68%	2.70%	6.81%	1.59%	1.57%
Snake Hatchery	0.07%	0.13%	1.12%	0.38%	1.73%
Tucannon Hatchery	0.28%	1.22%	0.00%	5.54%	2.24%
Tucannon Wild	0.00%	0.14%	0.92%	0.46%	1.01%

Finally, it appears that the earliest subyearling fall Chinook juveniles arriving at LMN were of hatchery origin, particularly those released into the Snake River (Table 3). Over the five years we analyzed, an average of approximately 40.4% of hatchery subyearling fall Chinook that were released into the Snake River were detected at LMN prior to the estimated date for the initiation of summer spill (Table 3). This indicates that these earlier hatchery releases likely contributed to the earlier summer spill initiation date. In addition, it appears that a smaller proportion of wild fall Chinook stocks from the Clearwater and Snake Rivers were detected at LMN prior to the estimated date for the initiation of summer spill (Table 3). This is relevant because this means that the vast majority of these stocks would have passed LMN after the reduced summer spill had been implemented and, therefore, may have been disproportionately affected by the reduced spill at LMN.

Table 3. Proportion of PIT-tagged juvenile subyearling fall Chinook detected at LMN prior to the estimated date of initiation of summer spill (2008-2012).

PIT-Tag Group	Percent Detected Prior to Initiation of Summer Spill				
	MY 2012	MY 2011	MY 2010	MY 2009	MY 2008
Clearwater Hatchery	5.98%	6.30%	48.65%	11.27%	14.58%
Clearwater Wild	0.00%	N/A	0.00%	N/A	0.00%
Snake Hatchery	26.01%	34.77%	70.25%	36.46%	34.33%
Snake Wild	2.23%	1.02%	13.86%	2.50%	10.30%

** In 2011 and 2009, very few PIT-tagged wild subyearling fall Chinook from the Clearwater River were detected at LMN. Therefore, reliable estimates of timing for this group were not possible.

Conclusions:

Past analyses have documented the importance of spill for juvenile reach survivals and SARs. Given this importance, we find no biological basis for reducing summer spill volumes for summer migrants. Analyses conducted for this memo demonstrate that the date of initiation of

summer spill, as outlined by RPA Number 29, results in an earlier reduction in summer spill, when compared to the current Court Ordered initiation date of June 21st. Over the past 10 years, RPA 29 would have resulted in an average of 14 additional days of reduced spill at LMN. Based on PIT-tag timing of hatchery subyearling Chinook and hatchery release schedules, it is clear that the date of initiation of summer spill under RPA 29 is largely influenced by hatchery release schedules. Finally, it appears that this earlier reduction in spill at LMN will have a disproportionate impact on particular stocks of wild yearling spring/summer Chinook and wild subyearling fall Chinook, as these stocks tend to have later timing.



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DATA REQUEST FORM

Request Taken By: Brandon Gockley Date: 16-April-2013

Data Requested By:

Name: Tom Lort (CRITFC) Phone: _____
Address: _____ Fax: _____
Email: lort@critfc.org

Data Requested:

what percent of subyearlings in Snake River
are released prior to June. How does this relate
to 2009 Biop trigger for start of summer spill,
specifically @ LAIN.

Data Format: Hardcopy Text Excel

Delivery: Mail Email Fax Phone

Comments:

Data Compiled By: [Signature] Date: 22-Apr-2013

Request # 18

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Brandon Chockley

From: Tom Lorz <lorz@critfc.org>
Sent: Tuesday, April 16, 2013 3:20 PM
To: Brandon Chockley
Subject: Data request

I am looking to better understand what percent of the sub yearlings present at LMN are represented by lions ferry and early production releases and when most of these releases occur. I want to understand if this is what drives the sub-yearling criteria, (after June 1st, 3 days when sub yearling predominate the sample, switch to summer operations) outlined in the 2008 BiOp currently under remand.

tom lorz