



# FISH PASSAGE CENTER

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## MEMORANDUM

TO: Henry Franzoni (CRITFC)

FROM: Michele DeHart

DATE: December 13, 2012

RE: Survival and migration timing for two release sites of Hanford Reach fall Chinook PIT-tagged and released in 2011 and 2012.

In response to your request, the FPC staff has analyzed PIT-tag data for Hanford Reach fall Chinook juveniles that were tagged and released in 2012. For comparison, we have included results from a similar analysis that was conducted for the 2011 Hanford Reach fall Chinook release groups (see FPC memo from April 18, 2012). Specifically, you requested that we analyze data from PIT-tagged fish that were released at two different release sites (Hanford and White Bluffs) to determine whether their survivals and/or migration timing were different. Below are our general conclusions from these analyses, followed by a more detailed discussion of the analyses.

- Juvenile survival estimates for the release to McNary Dam (MCN) reach in 2012 were similar for the two release groups. The release to MCN survival estimate for the Hanford group was 0.28, while that for the White Bluffs group was 0.26.
- Due to smaller release numbers in 2012, estimating survival beyond MCN was not possible.
- Median travel times from release to the various downstream projects were similar between the two groups in 2012. Median travel times in 2012 were also similar to what was seen in 2011.
- Passage timing at MCN, JDA, and BON was very similar between the two groups in 2012. The Hanford release group had an earlier 10% passage date at MCN in 2011 than

2012. Other than this, there was very little difference in the passage timing between the two years.

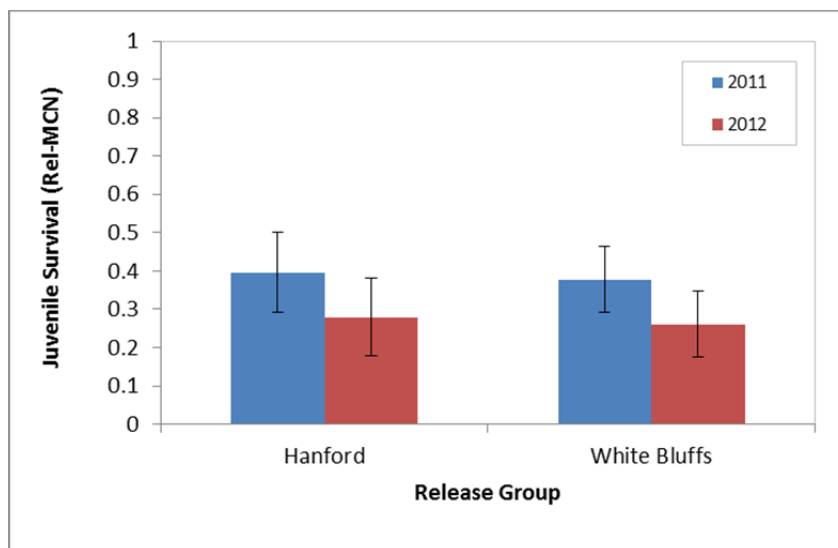
**Survival**

For this analysis, the FPC staff downloaded PIT-tag data from PTAGIS for the groups that were outlined in the original data request. Of the PIT-tag files you listed in your data request, we assigned those that ended with HAN to the Hanford Release Group (HAN) while those that ended with HWB were assigned to the White Bluffs Release Group (WBL). In all, 2,377 PIT-tagged subyearling fall Chinook were assigned to the HAN group and 2,515 were assigned to the WBL group for 2012. It is important to note that the PIT-tag release numbers in 2012 were less than half of those from 2011 (5,130 for HAN and 5,203 for WBL in 2011). In 2012, the HAN release group was tagged and released from June 5<sup>th</sup> to June 7<sup>th</sup> while the WBL release group was tagged and released from June 5<sup>th</sup> to June 8<sup>th</sup>.

In 2012, juvenile survival estimates for the release to McNary Dam (MCN) reach were similar for the two groups. The release to MCN survival estimate for the HAN group was 0.28, while that for the WBL group was 0.26 (Table 1). For both groups, the 2012 survival estimates for the release to MCN reach were lower than what was seen in 2011 (Table 1, Figure 1). However, given that the confidence intervals between the two years overlap, it is unlikely that the between-year differences in survival estimates are statistically significant. Finally, due to the smaller release numbers in 2012, it was not possible to estimate juvenile survival in the MCN-JDA or JDA-BON reaches. Furthermore, it was not possible to estimate an overall survival from release to JDA in 2012.

**Table 1.** Survival estimates for PIT-tagged Hanford Reach subyearling fall Chinook released at Hanford and White Bluffs in 2011 and 2012.

Release Year	Release Group	Rel-MCN (95% CI)	MCN-JDA (95% CI)	Rel-JDA (95% CI)
2012	Hanford	0.28 (0.18-0.38)	N/A	N/A
	White Bluffs	0.26 (0.18-0.35)	N/A	N/A
2011	Hanford	0.40 (0.29-0.50)	0.46 (0.26-0.65)	0.18 (0.12-0.24)
	White Bluffs	0.38 (0.29-0.46)	0.80 (0.43-1.17)	0.30 (0.18-0.42)



**Figure 1.** Estimated survival (Rel-MCN) of PIT-tagged Hanford Reach subyearling fall Chinook released at Hanford and White Bluffs in 2011 and 2012. Error bars are 95% confidence intervals.

## Travel Time and Migration Timing

Travel times for the two groups were similar in 2012 (Table 2). As in 2011, the fact that the travel times from release to MCN were in the 38-40 day range suggests that there was a great deal of post-tagging rearing for both groups. The largest difference in median travel times in 2012 was 2.33 days, which was for the release-to-BON reach. For this reach, the WBL group had the longer median travel time, at 42.6 days. Between-year comparisons indicate that the travel times in 2012 were very similar to those that were observed in 2011 (Table 2). This was consistent for all three reaches analyzed.

**Table 2.** Median travel times for PIT-tagged Hanford Reach subyearling fall Chinook released at Hanford and White Bluffs in 2011 and 2012. 95% confidence intervals are in parentheses.

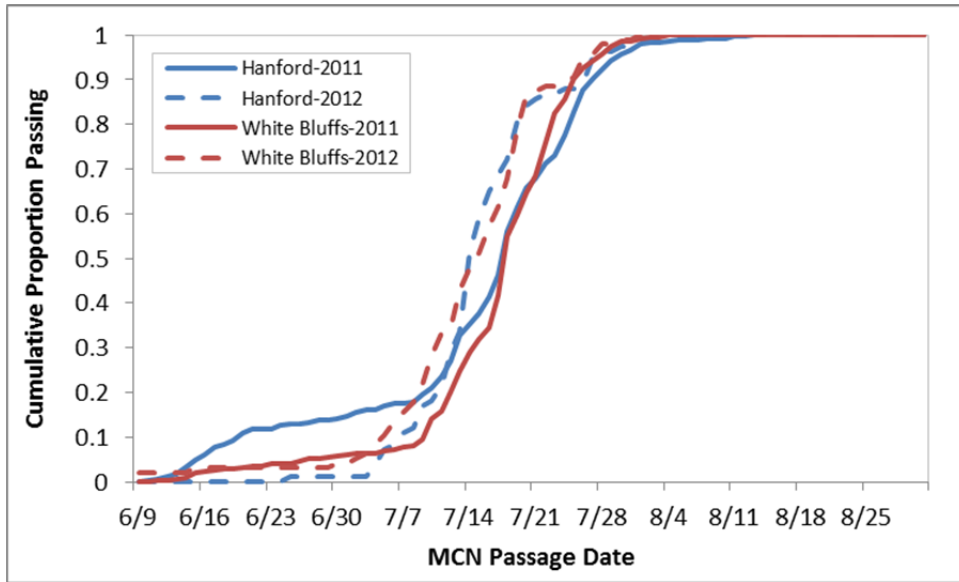
Release Year	Release Group	Release to MCN (95% CI)	Release to JDA (95% CI)	Release to BON (95% CI)
2012	Hanford	38.6 (37.9-39.3)	43.2 (42.3-43.6)	44.9 (43.9-46.1)
	White Bluffs	39.1 (36.4-40.9)	42.3 (41.3-42.7)	42.6 (40.2-45.2)
2011	Hanford	39.8 (38.8-40.4)	42.3 (41.4-42.9)	44.0 (42.5-46.1)
	White Bluffs	40.1 (39.4-41.0)	41.4 (40.4-41.8)	43.4 (42.3-44.4)

Passage timing for the two groups was also similar in 2012 (Table 3, Figures 2-4). This similarity in passage timing was true at three projects (MCN, JDA, and BON). In fact, between the two release groups, the estimated 10%, 50%, and 90% passage dates at all three projects were within two days of each other.

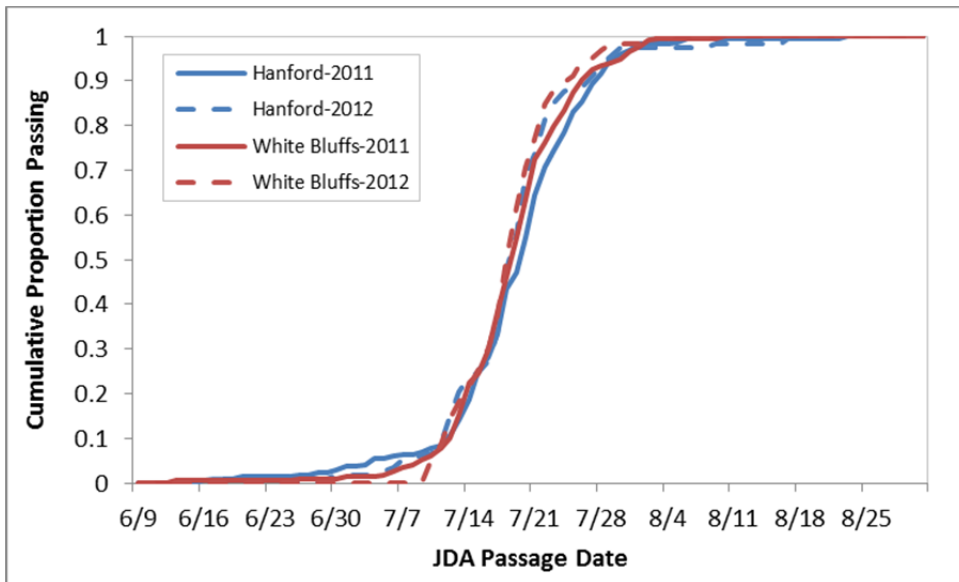
It appears that, for the HAN group, the early portion of the run at MCN was earlier in 2011 than 2012. For example, the estimated 10% passage dates for the HAN group in 2011 was June 20<sup>th</sup>, whereas that in 2012 was July 7<sup>th</sup> (Table 3, Figure 2). It does not appear that there were any other significant between-year differences in passage timing dates between the two release groups.

**Table 3.** Estimated 10%, 50%, and 90% passage dates at MCN, JDA, and BON for PIT-tagged Hanford Reach subyearling fall Chinook released at Hanford and White Bluffs in 2011 and 2012.

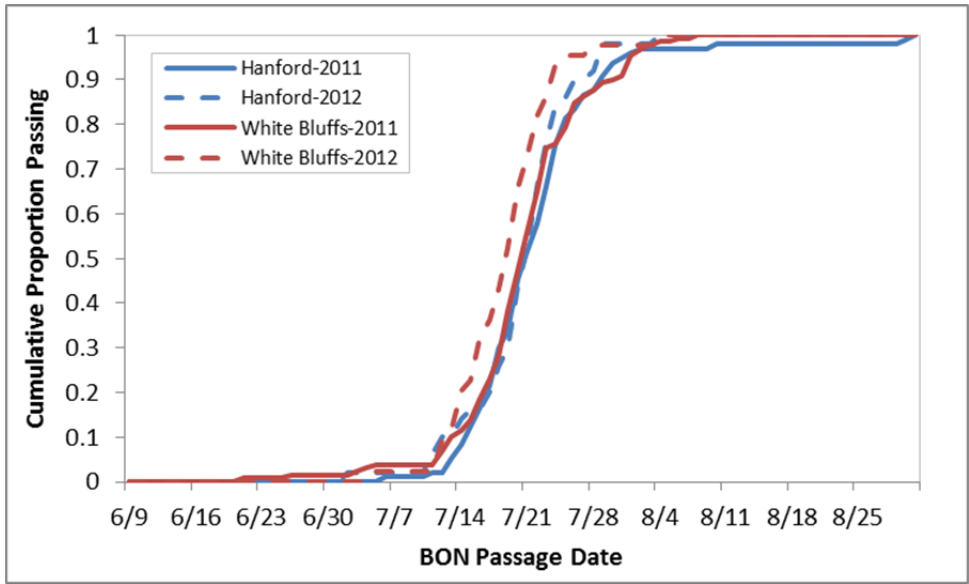
Release Year	Release Group	MCN			JDA			BON		
		10%	50%	90%	10%	50%	90%	10%	50%	90%
2012	Hanford	7-Jul	14-Jul	27-Jul	12-Jul	19-Jul	27-Jul	12-Jul	21-Jul	26-Jul
	White Bluffs	5-Jul	15-Jul	25-Jul	12-Jul	18-Jul	25-Jul	13-Jul	19-Jul	24-Jul
2011	Hanford	20-Jun	18-Jul	27-Jul	12-Jul	20-Jul	28-Jul	15-Jul	21-Jul	29-Jul
	White Bluffs	10-Jul	18-Jul	25-Jul	12-Jul	19-Jul	26-Jul	14-Jul	21-Jul	30-Jul



**Figure 2.** Cumulative MCN passage timing of for PIT-tagged Hanford Reach subyearling fall Chinook released at Hanford and White Bluffs in 2011 and 2012.



**Figure 3.** Cumulative JDA passage timing of for PIT-tagged Hanford Reach subyearling fall Chinook released at Hanford and White Bluffs in 2011 and 2012.



**Figure 4.** Cumulative BON passage timing of for PIT-tagged Hanford Reach subyearling fall Chinook released at Hanford and White Bluffs in 2011 and 2012.



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### DATA REQUEST FORM

Request Taken By: Michele DeHart Date: 14-Nov-2012

Data Requested By:

Name: Henry Franzoni - CRETFC Phone: \_\_\_\_\_  
Address: \_\_\_\_\_ Fax: \_\_\_\_\_  
Email: franz@critfc.org

Data Requested:

Update Hanford reach analysis - add 2012

Data Format: Hardcopy  Text  Excel

Delivery: Mail  Email  Fax  Phone

Comments:

Data Compiled By: [Signature] Date: 13-Dec-2012

Request # 68