



# FISH PASSAGE CENTER

1827 NE 44<sup>th</sup> Ave., Suite 240, Portland, OR 97213

Phone: (503) 230-4099 Fax: (503) 230-7559

<http://www.fpc.org/>

e-mail us at [fpctstaff@fpc.org](mailto:fpctstaff@fpc.org)

## MEMORANDUM

TO: FPAC

FROM: *Michele DeHart*  
Michele DeHart

DATE: May 10, 2012

RE: Sockeye juvenile mortality and descaling at Bonneville Dam, May 3-9, 2012

Over the past few days, the Fish Passage Center staff has noticed an increase in the mortality and descaling rates for sockeye juveniles at Bonneville Dam (BON). The purpose of this memo is to alert FPAC to these higher mortality and descaling rates. If these levels of mortality and descaling continue, FPAC may need to consider operational changes. Below, we have summarized the mortality data for juvenile sockeye at Bonneville Dam since May 1, 2012, along with operations of the first and second powerhouses.

- Mortality for juvenile sockeye since May 3<sup>rd</sup> has ranged from 2.9% to 10.6%. The higher mortality on May 3<sup>rd</sup> (18.2%) is based on a small sample count and, thus, may be unreliable. However, the estimates of mortality since May 3<sup>rd</sup> are based on larger sample sizes and, thus, are more reliable.
- The second powerhouse at Bonneville Dam was operated at the mid-range of the 1% efficiency range from the afternoon of April 30 to the morning of May 3<sup>rd</sup>. After this time, higher flows were passed through the second powerhouse, resulting in operating the powerhouse above the mid-range of the 1% efficiency range.
- Descaling rates for juvenile sockeye over this period have ranged between 0.0% to 23.1%. Both days of 0.0% descaling were days where fewer than 10 fish were in the sample. Therefore, the descaling data for these days should be interpreted with caution.
- Increasing above the mid-range of the 1% efficiency range at the second powerhouse coincides with the higher mortalities and descaling for juvenile sockeye at BON.
- The majority of sockeye juveniles passing BON at this time are mostly unclipped and are likely from the Upper Columbia.

Passage of sockeye juveniles at Bonneville Dam has increased substantially over the past several days (Table 1). Prior to May 1<sup>st</sup>, the average passage index for sockeye juveniles at BON was less than 100 fish per day. Since May 1<sup>st</sup>, the daily average passage index for sockeye juveniles at BON is 13,284 per day. On average, approximately 96% of the sockeye juveniles that have passed BON since May 1<sup>st</sup> are unclipped. It is likely that the vast majority of the sockeye juveniles passing BON at this time are from the Upper Columbia, as very few sockeye juveniles have been collected at the Snake River SMP sites, compared to those sites in the Upper (RIS) and Lower Columbia (MCN and JDA). Furthermore, the releases of hatchery sockeye smolts in the Snake River basin are not scheduled to occur until approximately May 12<sup>th</sup>.

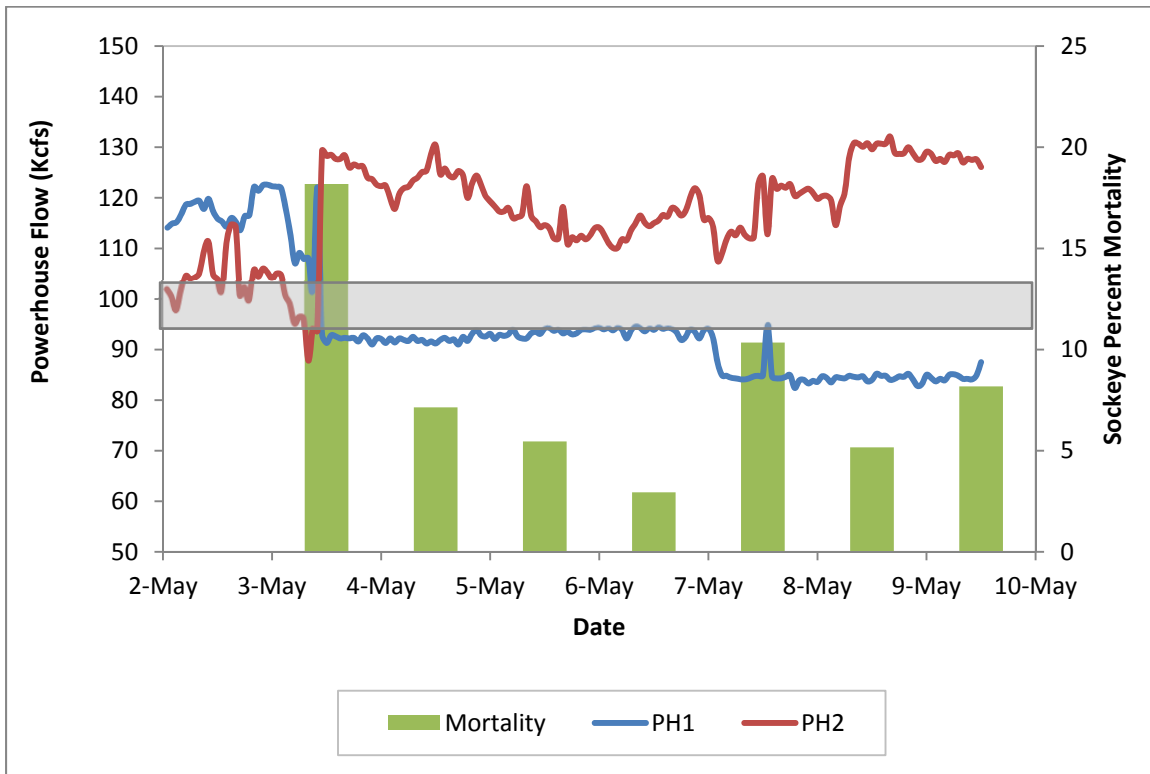
Over the past week, mortality and descaling rates for sockeye juveniles at BON have been consistently high. Sockeye juvenile mortality for the May 3<sup>rd</sup> sample was 18.2% (Table 1). However, this high mortality is based on a relatively low sample and should be interpreted with caution. Since May 3<sup>rd</sup>, mortality rates for sockeye juveniles at BON have ranged from 2.9% to 10.4%. These mortality estimates are based on larger sample counts and are likely more reliable. For comparison, during this period of high sockeye mortality, mortality rates for yearling Chinook and steelhead juveniles at BON were lower (0.0-4.8%) and often 0.0% (Table 1). Furthermore, the mortality rates for juvenile sockeye at McNary (MCN) and John Day (JDA) dams were lower over this same period (0.0-2.1% at MCN and 0.0-3.3% at JDA).

Descaling rates for juvenile sockeye over this period have ranged between 0.0% to 23.1%. Both days of 0.0% descaling were days where fewer than 10 fish were in the sample. Therefore, the descaling data for these days should be interpreted with caution. The descaling rates for juvenile sockeye at McNary (MCN) and John Day (JDA) dams over this same period ranged from 1.7% to 2.6% at MCN and 2.0% and 10.9% at JDA.

**Table 1.** Sockeye passage index, mortality, and descaling at Bonneville Dam for the period of May 1 to May 9, 2012. Percent mortality data are also shown for yearling Chinook and steelhead for comparison.

Date	SO Passage Index	Percent Mortality			Percent Descaling
		SO	CH1	ST	
5/1/2012	1,972	0.0	3.7	4.8	14.3
5/2/2012	571	0.0	0.0	0.0	0.0
5/3/2012	2,842	18.2	0.0	0.0	0.0
5/4/2012	7,135	7.1	1.8	0.0	10.3
5/5/2012	9,081	5.5	2.4	1.3	23.1
5/6/2012	3,697	2.9	1.9	0.0	6.1
5/7/2012	14,350	10.4	2.4	0.0	9.0
5/8/2012	31,693	5.2	3.6	0.0	6.9
5/9/2012	51,187	8.3	2.8	0.0	15.0

The second powerhouse at BON was operated at the mid-range of the 1% efficiency range from the afternoon of April 30<sup>th</sup> through late morning of May 3<sup>rd</sup>. This was a special operation for the May release of fall Chinook tules from Spring Creek NFH. Once this special operation was terminated on May 3<sup>rd</sup>, the second powerhouse was operated at higher flows above the mid-range of the 1% efficiency range. The operation of the second powerhouse above the mid-range of the 1% efficiency range appears to coincide with the increased mortalities and descaling among sockeye juveniles at BON (Table 1, Figure 1). However, it is unclear at this time whether the elevated descaling levels over the past week are due to debris in the forebay or conditions in the second powerhouse.



**Figure 1.** Operations of the first (PH1) and second (PH2) powerhouses and sockeye mortality at Bonneville Dam from May 2 to May 9, 2012. Shaded area is the estimated mid-range of the 1% peak efficiency range for PH2.