

BI-WEEKLY UPDATE: PINNIPED ABUNDANCE AND SALMON PREDATION AT BONNEVILLE LOCK AND DAM

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This is the third status report for the 2017 pinniped monitoring season and summarizes the observed predation and deterrent activities at Bonneville Dam from 1 January through 12 May 2017 with a focus on the interval since the last report (1 May – 12 May). Future updates and status reports will be issued on a bi-weekly basis.

PLEASE NOTE - All data presented here are preliminary as of the status report date. Predation numbers and abundance estimates are unexpanded and will change as data are proofed and analyzed. Final predation estimate data will be expanded to adjust for hours and days not observed as well as “unknown” prey species consumed for the final report. The final report summarizing the results of the 2017 Pinniped Monitoring Program will be available in the fall of this year.

PINNIPED ABUNDANCE

We present abundance data using the maximum number of individuals counted during a comprehensive tailrace point count and interpolated for times not observed. For inter and intra-year comparison of abundance estimates, we report average daily abundance with standard deviation as measures of variance.

Abundance 1 January – 12 May, 2017

The combined pinniped numbers at Bonneville Dam between 1 January and April 28 were below the 10 year average, however between the period 1 May to 12 the numbers rose above the 10 year average (Fig. 1). Daily counts of all pinnipeds from 1 May – 12 May, 2017 averaged $69.8 \pm SD 9.2$ animals. The dominate species in the tailrace continues to be Steller sea lions (SSL; *Eumetopias jubatus*) with an average abundance of $50.2 \pm SD 7.4$, followed by California sea lions (CSL; *Zalophus californianus*) with an average of $19.6 \pm SD 3.4$ (Fig. 2). No Harbor Seals (*Phoca vitulina*) were seen during this period (Table 1). The daily maximum count of 63 SSLs and 28 CSLs occurred on May 5 and May 4, respectively.

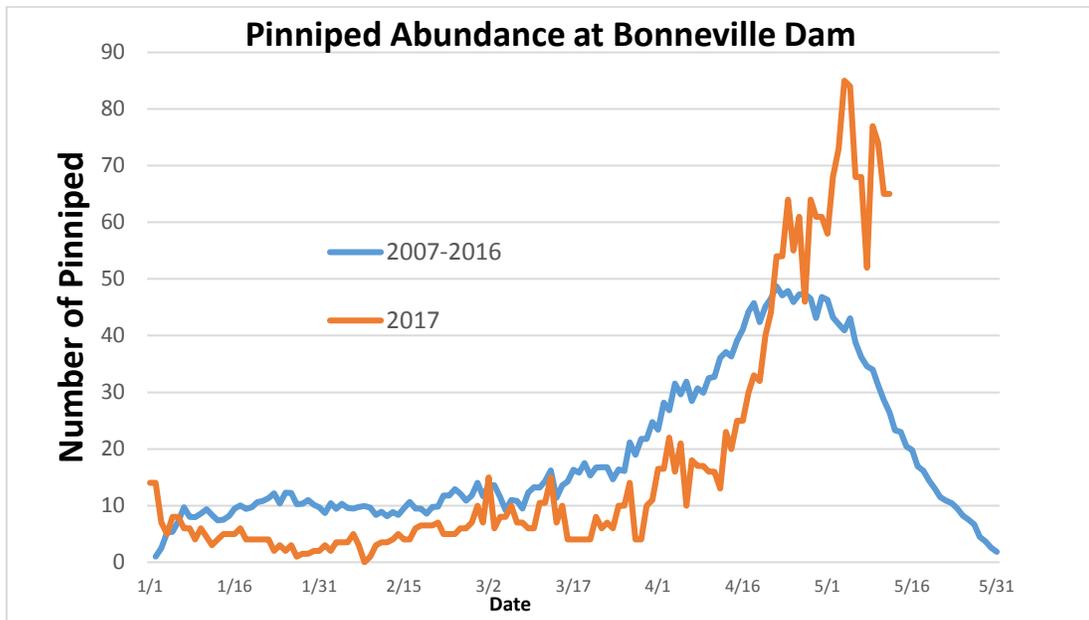


Figure 1. Comparison of estimated abundance of all pinniped species at Bonneville Dam between the 10 year running average and the current year.

To date, we have documented 15 SSL and 56 CSL as uniquely identifiable individuals. All uniquely identifiable pinnipeds have been seen on project in previous years or were recently branded on project (n = 19 CSL, 11 SSL). The states re-initiated SSL branding this year, the first since 2013. These brands will inform future study of pinniped impact on salmonid stocks.

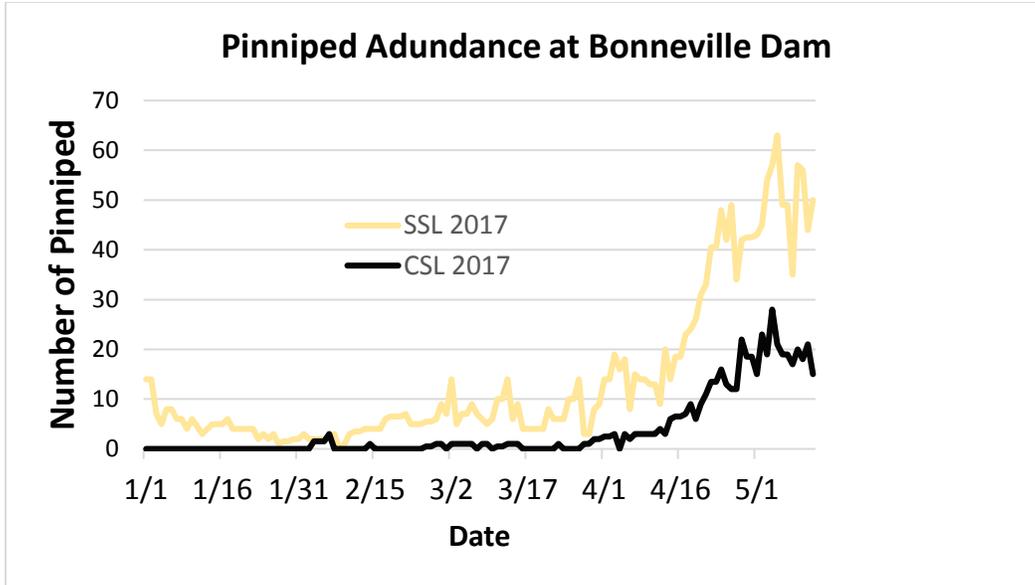


Figure 2. Comparison of estimated abundance of Steller sea lions (SSL) and California sea lion (CSL) at Bonneville Dam between 1 January and 12 May 2017.

Species	$\bar{x} \pm S.D.$	Range
SSL	50.2 ± 7.4	35 - 63
CSL	19.6 ± 3.4	15 - 28

Table 1. Interpolated daily minimum counts of pinnipeds at Bonneville Dam tailraces between 1 May and 12 May 2017.

PREDATION DATA

To enable contrast of historical predation data, and data collected in 2016 and 2017 using a new sampling scheme, we concatenate historical data by week and average across years to align it with the one week strata design now used to estimate predation. Expansion (via linear interpolation) for unidentifiable fish catches will be conducted at the seasons end once all data has been processed.

Predation 1 January – 12 May, 2017

Salmonid predation increased during the last week of April surpassing the ten year average then declined during the first week of May and has continued to decline since (Fig. 3).

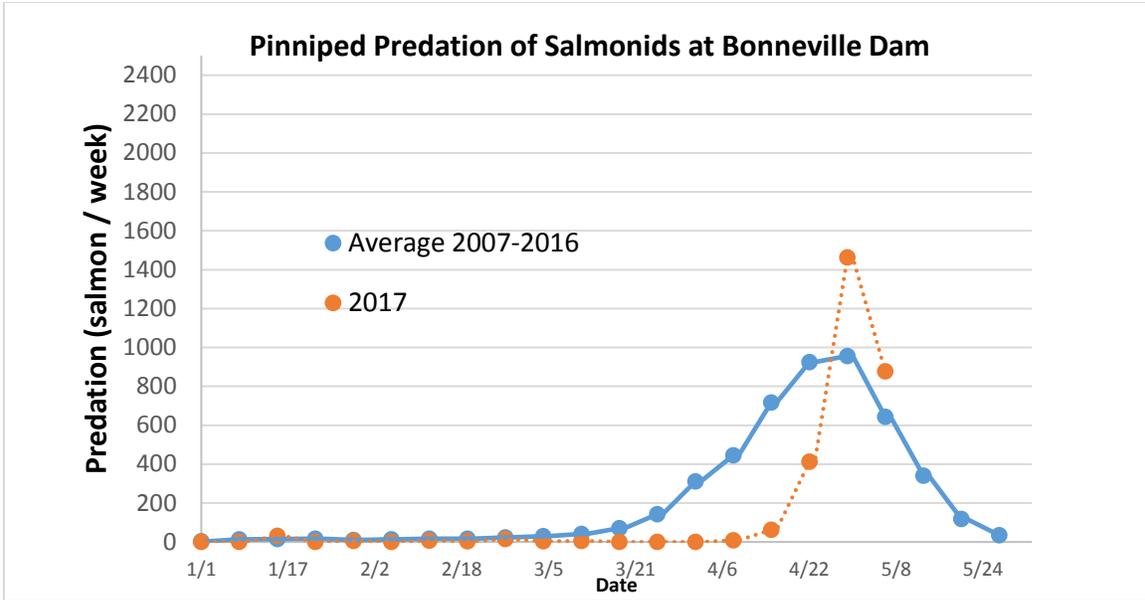


Figure 3. Comparison of estimated adult salmonid consumption by both species of pinniped at Bonneville Dam.

Between the period 1 May and 12 May 2017 we estimate that 2340 adult salmonids have been consumed. This estimate is greater than the ten year average estimate of 1599 adult salmonids for the same time period (Fig. 3). From 1 January to 12 May 2017, 82 percent of the fish consumed by pinnipeds have been Spring Chinook (*Oncorhynchus tshawytscha*). White sturgeon (*Acipenser transmontanus*), which historically (i.e. last 15 years) represented a large portion of the SSL diet, have been observed being depredated by pinnipeds six times. Pacific Lamprey (*Entosphenus tridentatus*) and other non-salmonid fish predation accounts for less than three percent of the total observed predation events.

The bulk of the predation has occurred by SSLs and is presumably a function of their increased and sustained presence at the dam relative to CSL (Fig. 2). In the last two weeks, there has been two times the number of SSLs compared to CSLs. This disparity in numbers likely accounts for the similarly disproportionate take of prey items by SSLs.

A review of the combined salmonid passage counts for the month of May indicates that the 2017 season is still below the ten year average, wherein as of May 12 only 33,288 adult salmonids had passed the dam. The number of Spring Chinook passing the dam continue to fluctuate, but the total number remains low. The current level of salmonid predation by pinnipeds is similar to the ten year average, but the reduced salmonid run suggests that the total impact by pinnipeds on this year’s salmonid run may be large.