

**STATUS REPORT – PINNIPED PREDATION AND HAZING
AT
BONNEVILLE DAM IN 2007**

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This report is the third of regular status reports on the pinniped predation and hazing activities being conducted at Bonneville Dam in 2007.

Background

This year it was determined to conduct what amounts to a maximum effort of non-lethal hazing with current tools available and within some restrictions for the use and conduct of hazing relating to fish passage issues and personnel safety concerns. In brief, the Corps has contracted USDA to conduct hazing of pinnipeds from the decks and shorelines of Bonneville Dam from dawn to dusk, seven days a week, beginning March 1 and ending May 31. Initially this was to include two hazers per shift, but USDA was unable to supply manpower to meet that requirement, so one hazer is present at most times and roams the project, although there is some overlap hours where both hazers are present. The states, NOAA, tribes, and others are participating with hazing from boats with the same schedule. Sometimes there will be two or more boats present, but typically one boat. Hazing consists of the use of crackershells, rubber bullets, and seal bombs from the boats only. When salmonid passage reaches 1000 per day, no seal bomb use will be allowed within the boat restricted zone. Other limitations on distance from fishway entrances and structures were determined and are being followed. Working as a team, the intent is to chase animals away from the face of the powerhouse and fishway and the boats can chase them out of the tailrace area.

We are also continuing our observation of predation on salmonids and sturgeon and began regular observations on January 8. Sea Lion Exclusion Devices (SLED's) were installed at Powerhouse 2 entrances on January 10, at Powerhouse 1 and B branch entrances the week of January 22, and Cascades Island today, March 9 (it had been dewatered). The Floating Orifice Gate barriers (FOG's) are to be installed in the next week or so at Powerhouse 2, but the orifices are closed, so no entry can occur. Acoustic deterrents were increased and installed and running at all fishway entrance areas by mid-January.

Preliminary Results

The first Steller sea lion (*Eumetopias jubatus*) was seen at Bonneville on December 10, 2006, the first California sea lion (*Zalophus californianus*) on January 8, 2007, and the first harbor seal (*Phoca vitulina*) on January 18, 2007. This is about one month earlier for the California sea lions to arrive than last year. We have seen as many as 9 Steller sea lions and 10 California sea lions at the dam so far in one day (February 28)(see Figure 1). Most of the California sea lions seen were also observed previous years, with a few newcomers.

Predation Figures

Unexpanded numbers for fish observed taken between January 8 and March 22 are:
217 salmon/steelhead (155 steelhead, 15 chinook, 68 salmonid)(see Figure 2)
353 sturgeon (55 larger than 5 feet)(see Figure 2)
8 Lamprey, 2 smolt, 217 unidentified (see Figure 2)

Hazing Impacts

Hazing actually began on February 28, for much of the day. February 28 was a practice day for hazing personnel from participating agencies, and full-time daylight hazing began on March 1.

Comparison of Week Prior to Hazing with First Week of Hazing

We compared observation data from the week prior to hazing activities (Feb. 5 – Feb. 27) with observations from the first week of hazing (Feb. 28 – Mar. 22). Results are outlined below.

PINNIPED ACTIVITY

Pinniped abundance before hazing began averaged 9.9 animals a day compared to 8.5 after hazing was implemented. This was most effective on Steller sea lions which are rarely seen anymore. However new California sea lions are beginning to show up now and the Chinook run is still to come.

SALMONID AND STURGEON CATCH

Looking at the third week into hazing, it now appears hazing activities are losing some of their impact on reducing the total number of salmonids caught. Total catches (salmonids and unknowns) have increased from 147 to 160 for similar periods. However, the Chinook run is just starting to show up and a better result will be how many salmonids are caught by the end of the season compared to the 2,500-3,500 over the past few years.

Steller sea lions are the primary predators of white sturgeon (*Acipenser transmontanus*) in the Bonneville Dam tailrace (only one taken by California sea lions). As Steller sea lion numbers declined, so did sturgeon catches. Observers recorded 78 sturgeon catches in the week prior to hazing, and only 10 during the first week of hazing. Five of the 12 taken during the first three weeks of hazing were caught on the first day of hazing, Feb. 28, which was a practice day.

NO-HAZING (FEB. 5-27)

	Adult Salmonids	Unknown	White Sturgeon
TOTAL	77	70	200
MEAN (Catch/Day)	3.3	3.0	8.7
STD. DEV. (Catch/Day)	2.6	2.3	6.4

Table 1. Observed total project (Powerhouse 1, Powerhouse 2, and Spillway tailraces) fish catch by pinnipeds at Bonneville Dam tailraces for Feb. 5 – 27, 2007.

HAZING (FEB. 28 - MAR. 22)

	Adult Salmonids	Unknown	White Sturgeon
TOTAL	120	40	12
MEAN (Catch/Day)	5.2	1.7	0.5
STD. DEV. (Catch/Day)	3.5	1.3	1.2

Table 2. Observed total project (Powerhouse 1, Powerhouse 2, and Spillway tailraces) fish catch by pinnipeds at Bonneville Dam tailraces for Feb. 28 – Mar. 22, 2007.

Summary

Preliminary observations show that hazing activities are having some effects on the behavior of sea lions at Bonneville Dam. Steller sea lion presence has been dramatically reduced, resulting in substantial declines in predation on white sturgeon near the dam. Hazing has been less effective at reducing California sea lion numbers and predation, but observers and hazing personnel have reported changes in sea lion behaviors. These changes include increased travel between tailraces in response to hazing, less time spent at the surface during foraging, and less time spent close to dam structures. Chinook salmon are the primary prey item for California sea lions at Bonneville Dam, are only beginning to arrive, so it is uncertain what impact hazing might have on sea lion predation in the long-term as the run increases and more sea lions travel to Bonneville Dam.

Figure 1. Daily minimum pinniped abundance.

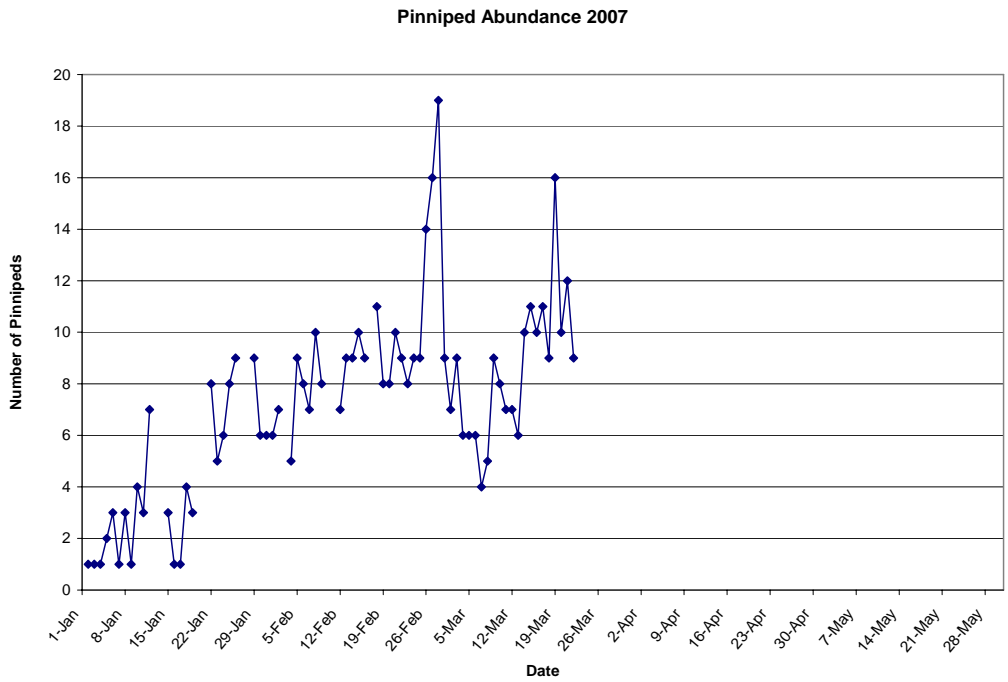


Figure 2. Daily salmonid, sturgeon, and unknown fish predation by pinnipeds.

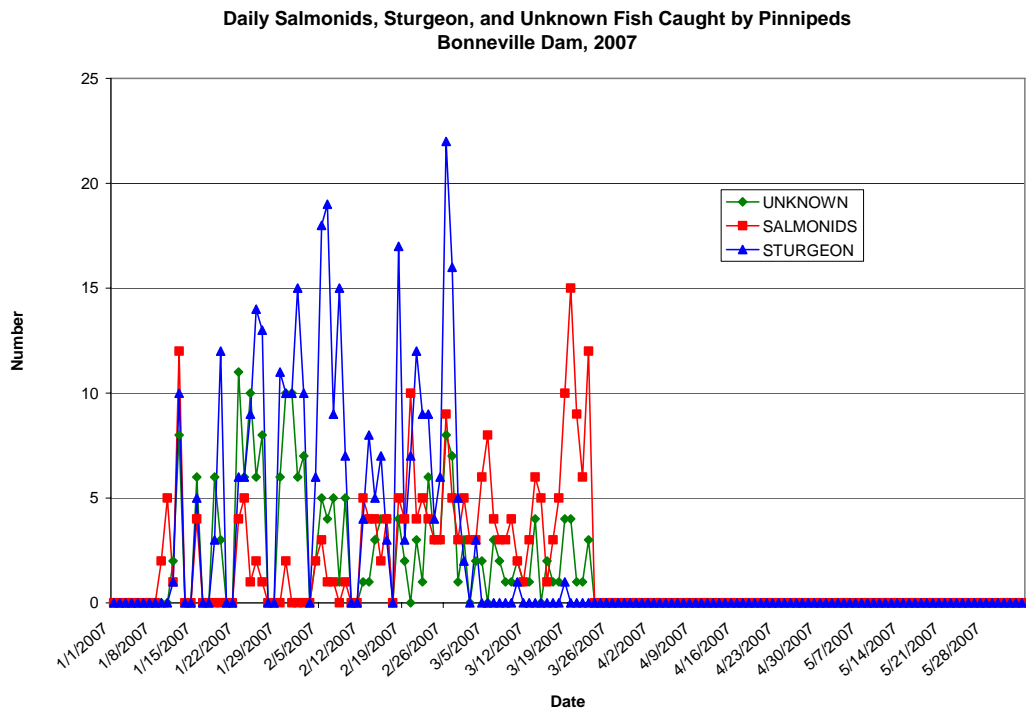


Figure 3. Sturgeon size distribution of those taken by pinnipeds.

