

HAZING PROGRAM

Close-out meeting on the Bonneville Dam
MMPA Section 120(C)(5) authorization
Pinniped-Fishery Interaction Task Force
Meeting January 2022

Doug Hatch, CRITFC



DAM AND BOAT-BASED HAZING AT BONNEVILLE

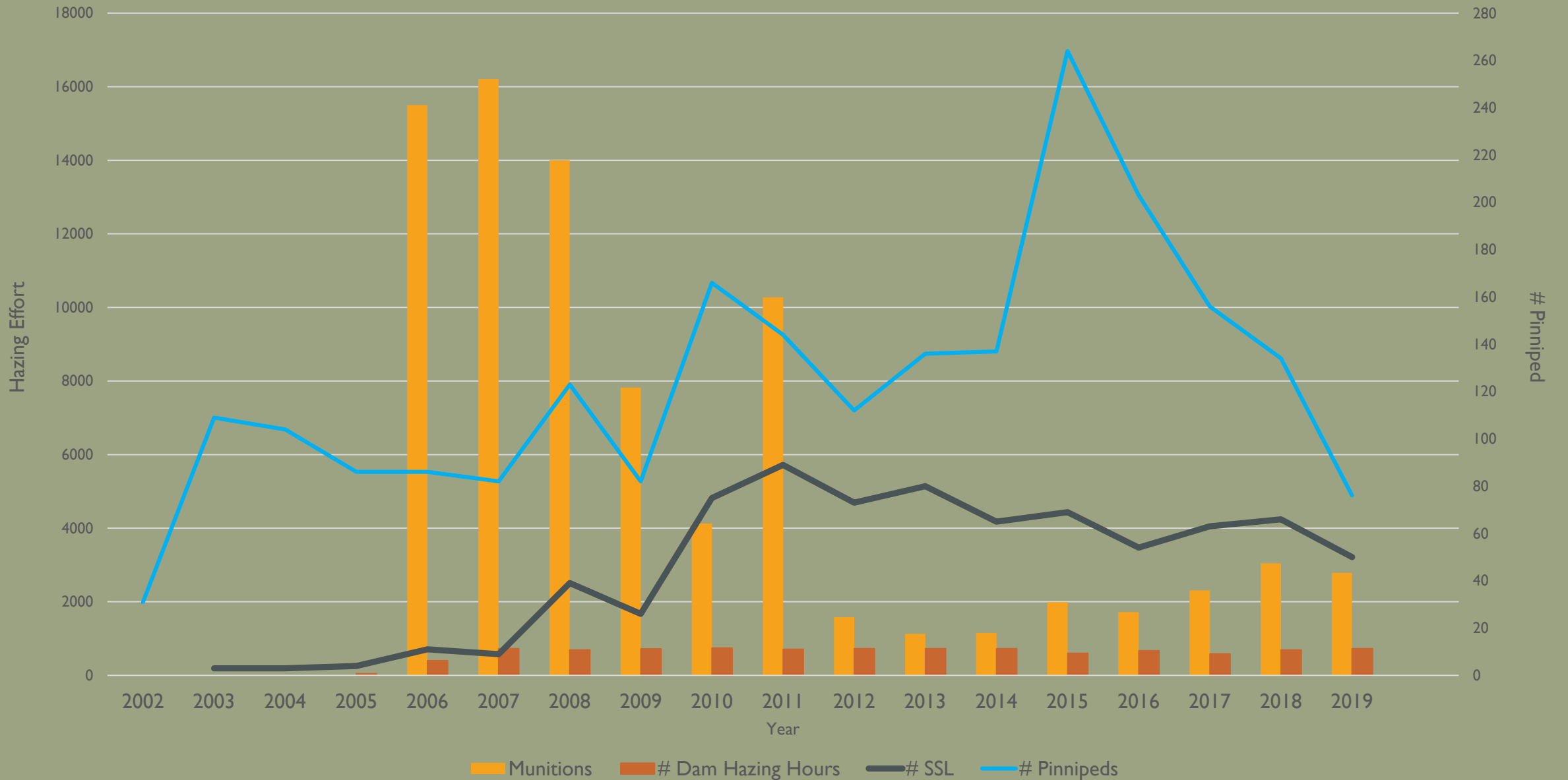


BOAT-BASED HAZING METHODS

- Conducted during daylight hours (started in 2006)
- From Bonneville Dam to roughly 6 miles downstream (3/4 time in BRZ)
- Vessel chase, seal bombs, cracker shells
- Use maximum of 5 munitions per animal per hazing event (since 2012)
- Approach the animal(s) from upstream and place munitions between boat and animals
- After 1000 fish / per day are counted at Bonneville – no more seal bombs used in the tailrace BRZ
- Coordinate with USACE Control Room and Fisheries Field Unit and USDA Wildlife Services staff
- Stay 30 m from all project structures and 50 m from fishway entrances.
 - No seal bomb use within 100m of fishways, floating orifices, Corner collector flume, or smolt outfall.
- Data Recorded
 - Time and location of initial encounter, species, direction of movement, fish kill information, numbers and types of munitions used, location and direction at the end of the encounter



2002-19 BONNEVILLE HAZING EFFORT AND ABUNDANCE



TIDWELL ET AL. 2021. STELLER SEA LION RESPONSE TO NON-LETHAL HAZING AT BONNEVILLE DAM. FRONTIERS IN CONSERVATION SCIENCE 2:1-9.



Steller Sea Lion (*Eumetopias jubatus*) Response to Non-lethal Hazing at Bonneville Dam

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Protected Steller sea lions (*Eumetopias jubatus*) aggregate at Bonneville Dam on the Columbia River and prey upon multiple species of endangered salmon ascending the river. Hazing is a non-lethal activity designed to repel sea lions that includes aversive auditory and physical stimuli to deter animals from an area and has been employed with sea lion—fisheries interactions for more than 40 years but sea lion responses to hazing through time is not well-documented. We observed the behavior of Steller sea lions in periods with and without hazing during two spring Chinook salmon passage seasons to evaluate: (1) what effect hazing had on the number of animals present and their foraging behavior, and (2) whether they habituated to hazing. We found that hazing temporarily reduced the number of Steller sea lions, but only when actively hazed. During hazing, Steller sea lions were more likely to move away from hazers on the dam, decreased their foraging, and increased their time investigating the environment. However, these effects were temporary; their behavior returned to initial observation levels once hazing ceased. Furthermore, their responsiveness to hazing declined throughout the season, indicating habituation and raising concern for the application and long-term efficacy of hazing in managing predation on endangered salmon.

Keywords: Columbia River, *Eumetopias jubatus*, habituation, hazing, human-wildlife conflict, non-lethal deterrence, Steller sea lion

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INTRODUCTION

The Marine Mammal Protection Act in 1972 is a conservation success story, accelerating the rebound of many Pacific Northwest pinniped populations [National Oceanic and Atmospheric Administration (NOAA), 2014; NOAA, 2015; Laake et al., 2018]. However, at the same time, largely because a mix of human development (Sobocinski et al., 2018; Cline et al., 2019), habitat destruction (Feist et al., 2003), and over-fishing (PFMC, 2016), 13 species of Columbia River salmon and steelhead have crashed and are now threatened or endangered (NMFS, 2019). An unintended consequence of pinniped recovery is that pinniped populations increasingly prey on endangered salmon (Schakner et al., 2016; Chasco et al., 2017). For more than 40 years, wildlife managers in the Pacific Northwest have sought to alter the foraging behavior of sea lions near impoundments to protect salmon runs. In the late 1980s, California Sea Lions (CSL, *Zalophus californianus*) predation significantly reduced endangered winter steelhead (*Oncorhynchus mykiss*) at Ballard Locks near Lake Washington in Washington State (Jeffries and Scordino, 1997; Fraker and Mate, 1999).

FINDINGS FROM TIDWELL ET AL. 2020

They observed the behavior of Steller sea lions in periods with and without hazing during two spring Chinook salmon passage seasons to evaluate:

1. What effect hazing had on the number of animals present and their foraging behavior; and,
2. Whether they habituated to hazing.

They found:

1. Hazing temporarily reduced the number of Steller sea lions, but only when actively hazed.
2. During hazing, Steller sea lions were more likely to move away from hazers on the dam, decreased their foraging, and increased their time investigating the environment. However, these effects were temporary; their behavior returned to initial observation levels once hazing ceased.
3. Responsiveness to hazing declined throughout the season, indicating habituation and raising concern for the application and long-term efficacy of hazing in managing predation on endangered salmon.