



December 12, 2018

Sea Lion Predation on Columbia River Salmon and Steelhead

Since the 1990s, concerns have grown about sea lion predation on Columbia River salmon and steelhead (salmonids). Management of these species has been complicated by requirements to protect sea lion populations under the Marine Mammal Protection Act (MMPA; 16 U.S.C. §§1361 et seq.) while maintaining efforts to recover salmonid populations under the Endangered Species Act (ESA; 16 U.S.C. §§1531 et seq.). Sea lion populations have increased since enactment of the MMPA in 1972. In the Columbia River Basin, 13 salmonid runs now are listed as threatened or endangered under the ESA. During the 115th Congress, several bills were introduced that would provide greater flexibility for lethal removal of sea lions in specific segments of the Columbia River and its tributaries. One of these bills, S. 3119, has passed the Senate and the House.

Background

Sea Lion and Salmonid Populations

Over the last several decades, California sea lions (*Zalophus californianus*) and the eastern population of Stellar sea lions (*Eumetopias jubatus*) that inhabit the U.S. West Coast have steadily increased. The California sea lion population has never been listed under the ESA and is estimated to be within the range of its optimum sustainable population (OSP). OSP is defined as the number of animals that will result in the maximum productivity of the population of the species. The eastern population of Stellar sea lions was delisted from the ESA in 2013 and likely is within the range of its OSP.

Salmonids (*Oncorhynchus spp.*) are anadromous fish, meaning they hatch and begin life in freshwater rivers and lakes, migrate to the ocean, where they mature, and return to their river of origin to spawn. The current run sizes of wild salmonids in the Columbia Basin are a small fraction of historic levels. From January through May of each year, the bulk of salmonids consumed by sea lions in the vicinity of Bonneville Dam are spring Chinook and winter steelhead. Sea lions also prey upon other Columbia River salmon runs and other species, such as sturgeon, eulachon, and Pacific lamprey.

In the 1990s, increasing numbers of California sea lions were observed in the lower Columbia River. By 2000, sea lions were observed at Bonneville Dam and, more recently, at the base of Willamette Falls. Sea lions prey upon salmonids, especially in areas where the returning fish gather to pass through areas where river flows are constricted, such as near fish ladders or at the base of rapids. Predation of salmon and steelhead immediately below Bonneville Dam (146 miles above the mouth of the Columbia River) has been increasing (Table 1). Since 2004, Stellar sea lions have consumed a growing portion of salmonids preyed upon by sea lions in the vicinity of Bonneville Dam.

Table 1. Consumption Estimates on Salmonids by California and Steller Sea Lions (January–May)

Year	Bonneville Salmonid Passage	Total Salmonids Consumed	Percentage Salmonid Run
2002	284,732	1,010	0.4%
2003	217,934	2,329	1.1%
2004	186,771	3,533	1.9%
2005	81,252	2,920	3.4%
2006	105,063	3,401	3.1%
2007	88,474	4,355	4.7%
2008	147,558	4,927	3.2%
2009	186,056	4,960	2.7%
2010	267,167	6,321	2.4%
2011	223,380	3,970	1.8%
2012	171,665	2,360	1.4%
2013	120,619	2,928	2.4%
2014	219,929	4,621	2.1%
2015	239,326	10,859	4.3%
2016	154,074	9,525	5.8%
2017	109,040	5,384	4.7%

Source: Tidwell et al., *Evaluation of Pinniped Predation on Adult Salmonids and Other Fish in the Bonneville Dam Tailrace*, 2017, U.S. Army Corps of Engineers, Portland District, March 5, 2017.

Notes: The data are for adult salmonids (adults and jacks) and include wild and hatchery fish.

Deterrence and Removal of Sea Lions

MMPA Requirements

The MMPA prohibits any person subject to the jurisdiction of the United States from “taking” marine mammals, including sea lions. Take “means to harass, hunt, capture, or kill, or attempt to harass, hunt, capture or kill any marine mammal.” The MMPA provides an exception for nonlethal efforts to deter nuisance animals—such as sea lions—if conducted by authorized personnel. Nonlethal taking must be done in a humane manner, and all practical steps must be taken to avoid death to or injury of the animal.

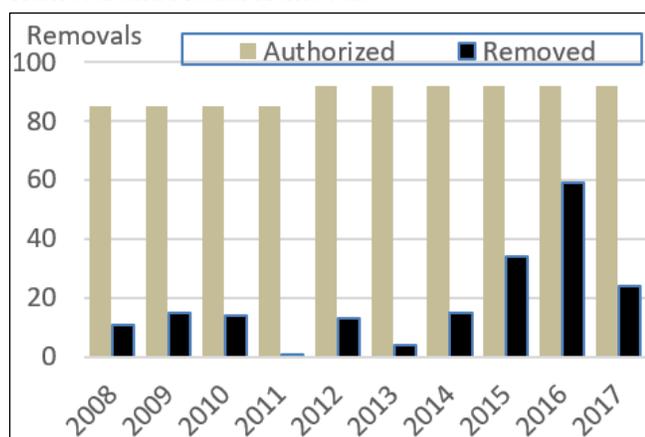
Section 120 (16 U.S.C. §1389) of the MMPA provides an exception for lethal removal when nonlethal actions are not successful. Under Section 120, a state may apply to the Secretary of Commerce to intentionally euthanize sea lions when individually identifiable sea lions or seals are having a significant negative impact on salmonids that have been listed as threatened or endangered or are approaching threatened or endangered status under the ESA. Before lethal removals are allowed, the Secretary decides whether sufficient evidence exists to establish a Pinniped-Fishery Task Force to review public comments, population and

biological trends, past efforts, and harm to salmonid populations. The Secretary is required to consider the task force's recommendations, public comments, and whether the applicant has already taken all reasonable, nonlethal measures. Nonlethal and lethal taking are prohibited if the marine mammal population is a depleted stock (endangered or threatened under the ESA) or a strategic stock under the MMPA.

Efforts in the Columbia Basin

Federal, state, and Columbia River Inter-Tribal Commission representatives have cooperated in developing nonlethal efforts to deter sea lions, such as above-water and below water pyrotechnics, barriers to fish passage entrances, high-pressure water spray, boat chases, rubber bullets, and capture and transfer to other areas. Generally, deterrence has been ineffective in the long run because sea lions have adapted to or ignored most of these measures, or they have returned after transport and release to other areas.

Figure 1. California Sea Lions Authorized for Lethal Removal and Actual Removals



Source: Tidwell et al., *Evaluation of Pinniped Predation on Adult Salmonids and Other Fish in the Bonneville Dam Tailrace*, 2017, U.S. Army Corps of Engineers, Portland District, March 5, 2017.

In 2008, the Secretary authorized lethal removal of 1% of California sea lion potential biological removals (PBR), a total of 85 animals per year, which was increased to 92 animals in 2012. PBR is defined as the number of animals that may be removed from a marine mammal stock while allowing the stock to reach or maintain its OSP. Before an animal can be considered for removal, the sea lion must be individually distinguishable, either by unique natural markings or by applied features such as brands. To remove an individual, the sea lion must have been observed

- eating salmonids in the areas below Bonneville Dam at any time between January 1 and May 31;
- in the area below Bonneville Dam on a total of any five days (during a single year or over multiple years); and
- below Bonneville Dam after having been subject to active nonlethal removal.

Historically, the number of animals removed and euthanized has been much lower than the number authorized (**Figure 1**). In 2016, the states requested and

were granted renewal of the authorization for lethal removal of sea lions in areas adjacent to Bonneville Dam through June 2021, under the same conditions as the 2012 authorization. Sea lions also consume ESA-listed salmonids that spawn in the upper Willamette River, a Columbia River tributary. In 2018, the state of Oregon requested and was granted an authorization for the lethal take of up to 92 California sea lions per year at Willamette Falls.

Congressional Action

In the 115th Congress, several bills have been introduced in the House and Senate that would amend the MMPA. Each bill would provide greater flexibility to remove sea lions for the purpose of protecting salmonids and other fish species. H.R. 2083, S. 3119, and S. 3315 include similar provisions that would

- expand the geographic area of the Columbia River and its tributaries where sea lions may be lethally removed,
- change the requirements for individual identification to include all sea lions found in these areas,
- increase lethal removal of sea lions in a given year to no more than 10% of PBR, and
- include certain regional tribes as entities that would be eligible to remove sea lions.

On December 6, 2018, the Senate passed S. 3119; the House passed it on December 11, 2018. Earlier in the session, the House passed H.R. 2083.

Differing Views

In 2006, the Marine Mammal Commission (MMC) concluded that if the choice is between the conservation of endangered and threatened salmonids and the removal of individual sea lions from healthy stocks, the MMPA directs that the conservation of the salmonids stocks take precedence. MMC also has questioned whether there is evidence that lethal removals have been effective; it has supported additional data collection and monitoring that could be used to improve program evaluation.

According to the Oregon Department of Fish and Wildlife (ODFW), removal of problem sea lions has proven to be the most effective means of protecting fish from predation. ODFW states that if sea lion predation is not addressed, constraints on other economic activities, such as power generation, fisheries, and land use, likely will increase and salmonid runs may be lost. However, the task force minority opinion has countered that sea lion predation is insignificant when compared to take of salmonids by humans. They contend that the life history of salmonids has made their populations vulnerable to environmental degradation caused by activities such as forestry, mining, agriculture, and hydroelectric generation. They add that these activities have been the main contributor to historical declines of salmon populations.

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