

Title: Predation on Salmon in the Columbia River--Part I: Sea Lion Impacts and Management in the Columbia River

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Abstract:

Prior to the turn of the century, sea lion abundance in the lower Columbia River was very low and animals seldom traveled to Bonneville Dam or Willamette Falls some 150 miles inland. Since 2001, total pinnipeds at Bonneville Dam during the spring has averaged 126 and 179 over the last 5 years. Additionally, the species composition and timing of pinnipeds has changed from exclusively California sea lions to a dominance of Steller sea lions, with the Steller sea lions residing at Bonneville Dam for nearly 10 months per year. Impacts on salmonid, sturgeon, and smelt populations from pinnipeds is extensive. Up to 6% of the spring chinook population was taken within ½ area of Bonneville Dam in 2016 and 25% of the wild winter steelhead population was taken below Willamette Falls in 2017. Additionally, losses of upriver bound spring chinook ranged from 51,751 to 224,705 between the estuary and Bonneville Dam from 2010 through 2015. Management actions include installing sea lion barriers at fish ladders, hazing, and lethal removal. Hazing has proven ineffective and 217 California sea lions were removed through 2018. New legislation passed in the 115th Congress enables area-based management instead of individual sea lion-based management and recognizes tribal management authority. An application for sea lion removal under PL 115-329 is in preparation and we hope to have new permits in place in 1 year.

Title: Predation on Salmon in the Columbia River--Part II: Death from Above and Below: Avian and Piscivorous Predation on Juvenile Anadromous Salmonids in the Columbia River, Successes and Failures

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Abstract:

Fish eating (i.e. piscivorous) birds in the Columbia basin from head water streams to the Columbia River estuary, are represented by a range of species from mergansers, terns, gulls, cormorants, pelicans, herons, osprey and even bald eagles. Predation, whether by birds or other predators, is a component of anadromous salmonid life history. When sufficient levels of quality habitat are present, losses by avian predators are not of major consequence in most cases. However, in the highly managed reaches of the Columbia and Snake rivers, this is not case, and many years of research has shown the opposite to be true. Millions of smolts are consumed annually throughout the Basin, with the severity of impacts increasing as smolts near the ocean, with Caspian terns, gulls, and double crested cormorants the key predators. An

overview of the problem and an update on management efforts will be presented. Juvenile salmonids are not safe in their home element and are threatened by piscivorous fishes in the Basin, particularly by non-native fishes. Historically, predation on juvenile salmonids was limited to a handful a piscivorous predators, among these northern pikeminnow, burbot, white sturgeon, bull trout, and sculpins. Today the number of predatory fishes has more than doubled, but for the focus of this presentation, the emphasis will focus on growing problem of predation by non-native walleye and smallmouth bass and an overview of management measures for non-native fishes. An update on a new predator, northern pike, will also be reviewed.