

Breaching the Snake River Dams to Support Southern Resident Killer Whale Recovery

There is compelling evidence to support the call for breaching the four lower Snake River dams as a measure to increase Chinook salmon numbers and help save the critically endangered Southern Resident Killer Whales (*Orcinus orca*) from extinction. This group of orcas is genetically distinct and differs in social structure, behaviors, physical characteristics, and geographical range from other orca populations. They have a strong feeding preference for Chinook salmon. Scientists who have spent years studying these whales are gravely concerned about their rapid decline. Since 1998, many Southern Residents have died, while far fewer have been born and survived.

Prior to late December 2014 the population had been reduced to only 76 orcas. *In May, 2015 NOAA Fisheries, the agency in charge of their recovery, designated the Southern Resident Killer Whales one of the eight endangered species most likely to go extinct in the immediate future.*¹ No new calves had survived between September 2012 and late December 2014. At least seven Southern Resident orcas had died during that period. The whales are dying due to cumulative pressures tied to nutritional stress and recovery actions taken to date are insufficient to prevent the extinction of these whales. These whales need a substantially larger Chinook salmon population on which to feed, as shown in multiple studies by both governmental² and non-governmental³ researchers. Significantly, after nearly a decade on the endangered species list, these endangered killer whales are not recovering.

Recently, however, the population has taken a more hopeful turn. Since late December 2014 the Southern Resident orcas have celebrated the birth of nine calves. Although this is good news, this means there are nine more mouths to feed with a declining number of salmon. While there is an expected 50% mortality rate in the first year of life for Southern Resident calves, hopefully all will survive. However, they are not light eaters. If all nine calves do live, the population will need between 30,000 and 50,000 additional Chinook salmon to sustain the calves as juveniles, and many more as they grow to adults. Breaching the Snake River dams in the immediate future likely would provide many of the additional fish the orcas need to recover. As the lower Snake River is restored, each year the runs should become larger and would support the growing needs of the orca population.

This abundant salmon supply is a necessity for the Southern Residents. The recent orca “baby boom” is not a mere coincidence, but likely is the result of larger than average Snake River Chinook salmon runs inflated by specially produced lower Snake River hatchery fish. The gestation period for orcas is approximately 17 months. That means the nine births coincide with the larger Snake River hatchery salmon runs that occurred in 2013 through 2015. These runs were inflated by hundreds of thousands of large fall Chinook salmon that had been specially bred as juveniles in a hatchery program for a transport research project. Many of the calves were conceived in the year

¹ NOAA Fisheries, *Species in the Spotlight, Survive to Thrive, Recovering Threatened and Endangered Species* (2015), http://www.nmfs.noaa.gov/stories/2015/05/docs/noaa_recoveringspecies_report_web.pdf.

² Ford, JKB, et al., *Linking Killer Whale Survival and Prey Abundance: Food Limitation in the Ocean's Apex Predator?* 6 BIOLOGY LETTERS 141 (2010), p. *3, <http://rsbl.royalsocietypublishing.org/content/early/2009/09/14/rsbl.2009.0468>. See also NOAA Fisheries, *SRKW Recovery Planning and Implementation* (2011), p. 2.

³ Ayres KL, et al. (2012) *Distinguishing the impacts of inadequate prey and vessel traffic on an endangered killer whale (Orcinus orca) population*. PLoS One 7: e36842, <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0036842>.

2013 when the Southern Residents largely were absent from the Salish Sea inland waters, presumably feeding on coastal Chinook, a number of which likely were the larger specially bred Chinook. The lower Snake River research project last released fish in 2012, which means the inflated fall Chinook runs will not continue. The fish were expensive to produce and the research project will not be resumed. Nonetheless, it is good evidence that when there are plentiful Snake River Chinook, the Southern Resident orcas can conceive, reproduce, survive and recover.

Endangered Salmon Mean Endangered Orcas

Within the United States, the Columbia-Snake River watershed is the most important source of salmon for the Southern Resident orcas. For millennia the Southern Residents have depended on Chinook salmon from this watershed, which once produced millions of Chinook annually, supporting a rich ecosystem that included both killer whales and humans. However, the number of salmon produced by the watershed has declined greatly. Indeed, in 2008 NOAA Fisheries stated that, “[p]erhaps the single greatest change in food availability for resident killer whales since the late 1800s has been the decline of salmon from the Columbia River basin.”⁴

Over 50 large dams constructed on the rivers since 1933 are the major cause of salmon declines in the watershed. Today, only a small fraction of the historic numbers of salmon return to the watershed to spawn, reflecting high mortality of adults moving upstream and juveniles moving downstream. Thirteen salmon and steelhead populations now face extinction and are listed under the Endangered Species Act (ESA).⁵ The ESA requires the federal government to recover these salmon species. For the Snake River in particular, both old and new research points in one direction - the dams are a major cause of decline of the salmon runs.⁶ The four lower Snake River dams, constructed in the 1960s and 1970s, are obstructing 140 miles of prime salmon migration waterways. The dams also have inundated the lower Snake River fall Chinook salmon’s mainstem spawning and rearing habitat. In 1992, both fall run and spring/summer-run Snake River Chinook were listed as threatened under the ESA.⁷ By 1999 Columbia River fall Chinook were added to the ESA list as threatened, while the spring-run Chinook, which had collapsed to near extinction, warranted the highest listing as endangered. As the Columbia-Snake River salmon declined, so did the orcas. By 2005 the Southern Resident killer whales had also earned the highest listing of endangered.

Even though the Columbia-Snake River prey resource is greatly reduced, the Southern Residents rely on it and can be found in the coastal waters of the Northeast Pacific Ocean more than half the year.⁸ Research conducted over the last decade shows that Columbia-Snake River Chinook

⁴ NOAA, *SRKW Recovery Plan Recovery Plan for Southern Resident Killer Whales*, (Orcinus orca), National Marine Fisheries Service, Northwest Region, Seattle, Washington (January 2008), p. II-82.

⁵ NOAA Fisheries, (2014) *Federal Columbia River Power System Biological Opinion*, http://www.westcoast.fisheries.noaa.gov/fish_passage/fcrps_opinion/federal_columbia_river_power_system.html.

⁶ See e.g., *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 839 F. Supp. 2d 1117, 1131 (D. Or. 2011) (“[T]here is ample evidence in the record that indicates that the operation of the FCRPS causes substantial harm to listed salmonids. . . . NOAA Fisheries acknowledges that the existence and operation of the dams accounts for most of the mortality of juveniles migrating through the FCRPS.”)

⁷ U.S. Fish and Wildlife Service. Species profile for Chinook Salmon (*Oncorhynchus tshawytscha*), <http://ecos.fws.gov/speciesProfile/profile/speciesProfile?spcode=E06D>.

⁸ See 134 J. Acoust. Soc. Am. 5, Hanson et al., *Assessing the Coastal Occurrence of Endangered Killer Whales Using Autonomous Passive Acoustic Recorders* (November 2013), 3486, <http://oceanwidescience.org/cms/wp-content/uploads/2014/12/Hanson-et-al-2013.pdf> (on average the Southern Residents occur in inland waters less than half of the days each year.)

remain crucial to the Southern Residents' continued existence. The whales appear to be especially reliant on the Snake River's nutrient rich, high fat content early spring-run Chinook.⁹ Significantly, recent NOAA Fisheries acoustic and satellite tag studies indicate that the Southern Residents' visits to the coastal waters off Westport, Washington and the mouth of the Columbia River coincide with high concentrations of spring Chinook salmon.¹⁰ In fact according to the satellite tags, the orcas' travels often center around the mouth of the Columbia River.

Recovery Measures Are Not Working

The federal government, through NOAA Fisheries, has a legal obligation to recover the populations of ESA listed salmon and orcas.¹¹ Still, after 24 years on the endangered species list, wild salmon runs on the Snake River are not meeting federal survival goals, much less recovery goals.¹² At this point it is obvious that NOAA's recovery measures are not working for either wild salmon or the Southern Resident Killer Whales. In fact, a federal court has thrown out NOAA's salmon recovery plan repeatedly for violating the Endangered Species Act, remanding with orders to rewrite the plan to include measures that will permit the Columbia-Snake River watershed salmon to recover.¹³ Again and again the court has directed the federal agencies to consider removing the four lower Snake River dams. Yet to date, they have failed to do so.

To Recover Endangered Salmon and Killer Whales, Dam Breaching Is Required

It is clear that breaching the four federal dams on the lower Snake River is the major step needed to avert extinction of the lower Snake's salmon and to restore access of salmon and steelhead to 15 million acres of cooler, high-elevation watershed. This would substantially increase spawning habitat for lower Snake River Chinook and greatly increase the availability of a critical food source for the endangered Southern Resident orcas.

The recovery of Southern Resident Killer Whales depends on abundant salmon. This will be impossible to provide in the near term, without restoring productivity to the Columbia-Snake River watershed. Breaching the four lower Snake River dams is the quickest single measure most likely to restore the abundant wild Chinook salmon runs the whales need to recover. No other action under consideration has the potential to increase the SRKW population to a level where they could be down-listed to threatened or removed from the ESA completely.

⁹ Ayres KL, et al., supra, <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0036842>.

¹⁰ Northwest Fisheries Science Center, NOAA Fisheries. 2013 Southern Resident Killer Whale Satellite Tagging,

http://www.nwfsc.noaa.gov/research/divisions/cb/ecosystem/marinemammal/satellite_tagging/blog.cfm;

2015 Southern Resident Killer Whale Satellite Tagging,

http://www.nwfsc.noaa.gov/research/divisions/cb/ecosystem/marinemammal/satellite_tagging/blog2015.cfm;

2016 Southern Resident Killer Whale Satellite Tagging,

http://www.nwfsc.noaa.gov/research/divisions/cb/ecosystem/marinemammal/satellite_tagging/blog2016.cfm.

¹¹ In addition, the Army Corps of Engineers is required to review federal dam operations when advisable, to improve the quality of the environment in the overall public interest. 33 U.S.C. § 549a.

¹² Bonneville Power Administration, et al., *Federal Columbia River Power System Improvements and Operations under the Endangered Species Act – a Progress Report* (2013), pp. 2-3, 40-41, 51, <https://www.salmonrecovery.gov/docs/FinalHydroSynthesisWithReview9-20-13.pdf>. See also NOAA Memorandum, Zabel, R., *Preliminary Survival Estimates for the Spring-migrating Juvenile Salmonids through Snake and Columbia River Dams and Reservoirs*, 2015, 9/10/15, p. 2, http://www.nwd-wc.usace.army.mil/tmt/agendas/2015/1021_Preliminary_Survival_Estimates_Memo_2015_1021.pdf.

¹³ See, e.g., *Nat'l Wildlife Fed'n v. Nat'l Marine Fisheries Serv.*, 839 F. Supp. 2d at 1122-1123, 1129-1132 (summarizing the history of the litigation).

Dr. Deborah Giles
Research Director
Center for Whale Research
P.O. Box 1577
Friday Harbor, WA 98250
(360) 378-5835
giles@whaleresearch.com