To The House Committee on Water
Oregon State Capitol
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Members: Rep. Ken Helm, Chair Rep. Gary Leif, Vice-Chair Rep. Jeff Reardon, Vice-Chair Rep. Vikki Breese-Iverson Rep. Mark Owens Rep. Karin Power Rep. E. Werner Reschke Rep. Marty Wilde Rep. Brad Wit

To Whom It May Concern,

"The frequency and duration of blue-green algae blooms appear to be increasing," according to Otten and OSU professor Theo Dreher. They believe a number of factors are contributing, including rising air and water temperatures, atmospheric carbon dioxide concentrations, extreme weather and increased runoff of nutrients from urban and agricultural lands. It has been found that the loss of the aquatic temperature diversity may be as significant to salmon and trout in the Columbia and Snake Rivers and their major tributaries as maximum temperatures. Therefore, it has been stated that protection and restoration of temperature diversity is critical in order for salmonids to migrate through these waters with minimal thermal stress.

DEQ has temperature data for 20 long-term monitoring sites over a 10 year period. Data analyses indicates that water temperatures are still exceeding rearing and migration and spawning criteria for the five salmon species in the CRS .
A number of studies, including the Coastal Coho Stream Assessment for example, which incorporated biological surveys together with water and habitat surveys have identified temperature, sediment, total solids, habitat modification and dissolved oxygen as concerns (DEQ 2009 Re Map).

Furthermore, in May of 2017, the U.S. Army Corps of Engineers announced it would no longer test algae blooms at the reservoirs it manages, including at the popular Lane County reservoirs. In 2015, 2016, 2017, 2018, and 2019 warming water temperatures in the Pacific Northwest what NOAA nicknamed the 'blob" blanketed the whole pacific west coast from California to Alaska while record high temperatures in the CRS decimated sturgeon and wiped out returning runs of wild and hatchery salmon . Currently, marine fish, marine mammals, and crabs, on the west coast are suffering from high incidences of domoic acid poisoning caused by toxic algae that bio-accumulates as it moves up the food chain..

It was back in February 2001, when the federal courts ruled that the US Army Corps of Engineers were required to comply with the Clean Water Act in its management of dams. The courts determined that the dams caused temperature increases and gas supersaturation that exceeded limits under the Clean Water Act. Dam Reservoirs might contribute to changes in the Earth's climate and so the precautionary principle ought to be applied by demanding a breaching under current conditions with the very well possibility

of extinction for the 73 Southern Resident Orca and the wild Snake River Chinook if these four dams are not removed.

Specifically, the reservoir habitat formed behind the dams creates slow backwaters and warmer temperatures throughout the river, benefiting smallmouth bass populations and disfavoring natives (Zimmerman and Parker, 1995; Naughton et al., 2004; LaVi-gne et al., 2008). Small-mouth bass abundances are higher in forebay and mid-reservoir areas, where the lowest flows, warmest water, and highest water clarity occur (Zimmerman and Parker, 1995).Climate change is predicted to expand the amount of suitable habitat for smallmouth bass (Vander Zanden et al., 1999, 2004;Sharma et al., 2009) as well as extend the warm-water periods in impoundments, leading to more temporal **overlap between juvenile salmon and smallmouth bass** (Petersen and Kitchell,2001). Thus, the impact of smallmouth bass is expected to increase in the PNW with rising temperatures (Beamesderfer and North, 1995; Tabor et al. 2007)(133).

"Predation is frequently associated with approximate cause of mortality because virtually any factor that weakens or disorientates a salmon will increase the probability of predation," Grossman.

For example, copper concentrations commonly found in the Ca Delta waters produces abnormal behaviors in Coho salmon that render them more susceptible to predators. In this case predation may be the "Approximate" cause of mortality but the contaminant is actually the "ultimate" cause," G. Grossman.

"When considering salmon mortality one must distinguish between approximated and ultimate causes of death because management efforts as expensive as they are can only be so successful when they address the "ultimate" causes," says Dr. Gary Grossman.Professor of Animal Ecology Warnell School of Forestry and Natural Resources University of Georgia

Moreover, our reality is that ever changing climate extremes and toxic pollution threaten the ecological relationships that support life for wild Chinook and the Southern Resident orca, and many other species that rely on cold water and clean air for their survival. The fabric of these ecological relationships are being, unraveled, fragmented, packaged and sold under the mechanistic worldview in the name of human progress and the cost will be as history has shown us—reduced salmon sustaining ecosystems and mass species extinction. Future increases in global ocean and river water temperatures due to ongoing climate change, will favor further expansion of warm water piscivores, particularly largemouth bass and channel catfish (Poe et al. 1991). All of the mainstem Columbia sites and the John Day and Umatilla Rivers exceeded Oregon's Columbia Basin 20 C temperature criterion intended to protect salmonids (State of Oregon, OAR 340-041-0101.

Altogether, in the PNW, temperatures greater than 15◦C (59 degrees) have been shown to increase smallmouth bass consumption rates and predation on juvenile salmon (Fayram and Sibley, 2000; Tabor et al., 2007). (pg 5 -11) As an example, juveniles of fall run

chinook salmon (Oncorhynchus tshawytscha) are smaller than spring–summer run chinook juveniles, and preference by alien smallmouth bass (Micropterus dolomieui)for them may reflect size-selective preferences (Tabor et al. 1993, Zimmerman 1999).(pg 05 -11)

In addition to smallmouth bass, other non-native predators such as channel catfish, American shad are present throughout the PNW (Sanderson et al., 2009). Results from studies to date indicate that juvenile shad prey heavily on zooplankton taxa, which are also a primary prey resource for juvenile Chinook in the same habitats (Haskell et al. 2006a). At least **54%** of the resident fish species in Washington, **50%** in Oregon, and **60%** in Idaho are non-natives (Sanderson, etal.2009). For example, "salmonids composed up to 100% of channel catfish diets in the Columbia and Yakima rivers, and similar percentages were reported for smallmouth bass and walleye diet." Sanderson Beth 08. "In the Columbia River, most of the exotic fishes are located in backwaters and reaches with lentic characteristics, and **native fishes are most common in the free flowing mainstem ,"**(Hjort et al. 1981). Sanderson found at locations in the Columbia River, smallmouth bass and walleye consumed between 18,000 to 2,000,000 and 170,000 to 300,000 juvenile salmonids per year, respectively. Similar predation rates were noted in all geographic areas (Columbia, Snake, and Yakima rivers, and Washington lakes and coast)(NMFS, Sanderson 2009). **Small mouth bass are now the most widespread non native fish in the PNW,** Boersma et al., 2006; Sanderson et al., 2009.

"Most predation occurs when young fish migrate downstream to their adult habitat the sea," Dr. Gary Grossman.

Predator removal programs no matter how expensive are not a worthy investment as a means to increase and protect populations of endangered salmon and steelhead because there will always be another predator species that will move in and fill the nitch of the targeted species.

This is not a theory. It is well documented that although BPA funds expensive incentive programs such as the pike minnow removal program which has been successful in removing large numbers of pike minnow from the CRS--- their populations still outnumber wild salmon populations At the same time BPA **funding the removal of the pike minnow is assisting the ability of the small mouth bass population to proliferate** and which they now out compete the wild fish for resources as well they heavily predate on Snake River- juvenile Chinook salmon.

"Unfortunately the endangered salmon reside in a highly altered habitat difficult to establish a hierarchy on the cause effecting salmon mortality. Consequently assigning a value to potential increase in of salmon abundance that will be produced by predator control is problematical." "When compared to increases potentially from other remediation of other negative influences such as degraded habitat, altered flow regime and contaminants. " Dr. Gary Grossman

It is time to honor Mother Nature and be respectful and kind to the human and non- human animals that we share the planet, and now is the time to address the "Ultimate "causes of global climate change if we are serious about lowering its negative impacts facing public health, coastal economies, fresh water aquifers, wildlife, and marine and fresh water species

and the cold water habitats that they so rely on for their survival, not sport. “Cycles and renewal are a fundamental part of the miracle of life and of the biophysical process that support it. Look inside the word *product* and you will see no ecological cycles.” Jim Lichatowich (51, 99).

Adhering to a mechanistic worldview and increasing the fish factory’s industrial process to maximize the “harvest” then we are all in danger and guilty of expediting the starvation and demise of multiple iconic endangered and threatened species in the name of human so called ‘sport,” “profit” and “progress”.

Therefore the long term survival of these iconic species demands investing into cold water habitat; installing pacific lamprey friendly fish screens, unblocking the 42, 780 man made obstacles that inhibit and prohibit wild fish migration, toxic remediation of our waterways and resurrecting and protecting the historical and ecological relationships.

“Ninety percent of the fresh salmon eaten in the United States now comes from a farm, and most of it is raised at densities that would make a coop full of battery hens seem palatial.”

In closing, quantifiable success can be measured by the number of returning wild fish, crab and other species now observed producing in the Elwha River. Wild Salmon populations need ocean and river water temperatures below 68 degrees. Endangered salmon and steelhead populations will be effected by water quantity and water quality of the Columbia River estuary. Wild salmon need access to food and accessible cold water spawning grounds. It is exciting to witness the ecological transformation happening on the Elwha River and its coastal habitat taking place after the breaching of the dam in such a short time.

I hope this is helpful.

Thanks for your time and assistance.

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Sources:

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1. Scarce, Rik. Fishy Business: Salmon, Biology, and the Social Construction of Nature. Philadelphia: Temple University Press, 2000.
2. Lichatowich, Jim. “Salmon, People and Place “ A Biologist’s Search for Salmon Recovery. Corvallis OR: Oregon State University Press, 2013.
3. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3464026/
4. http://www.ourstolenfuture.org/
5. Sergio, F., Newton, I., Marchesi, L., and Pedrini, P. (2006). Ecological justified charisma: preservation of top predators delivers biodiversity conservation. Journal of Applied Ecology 43: 1049-1055.
6. Since 1981, Dr. Grossman has been a professor of animal ecology from the University of Georgia. His primary research areas are “population dynamics and habitat selection and fishes.” He has published over one hundred and fifteen scientific papers, cited over 5,000 times. For the last twenty years has been advising fisheries agencies in California. In addition, in 2013 led a public hearing on the effects of fish predation on endangered salmonids that produced a technical report. He has recently completed a general review
7. https://academic.oup.com/bioscience/article/64/4/279/2754168/Using-Beaver-Dams-to-Restore-Incised-Stream
8. https://www.americanrivers.org/2016/09/five-years-later-elwha-reborn/

9. The Case for Breaching the Four Lower Snake River Dams to Recover Wild Snake River Salmon Carl Christianson, Biologist, retired USACE; Sharon Grace, Attorney; Jim Waddell, P.E., retired USACE1
10. http://voices.nationalgeographic.com/2013/08/29/rebirth-on-the-river-washingtons-elwha-flourishing-after-big-dam-removals/
11. http://www.estuarypartnership.org/press-release/2013/federal-support-toxics-reduction-needed-columbia-river
12. Theurer et al. (1985) in the Tucannon River in southeastern Washington. This study shows how human-caused changes in riparian shade and channel morphology contributed to increased water temperatures, reduced available spawning and rearing space, and diminished production of steelhead and chinook salmon.
13. USEPA (United States Environmental Protection Agency). 2002. Columbia River Basin fish contaminant survey, 1996-1998. EPA 910-R-02-006, Seattle, Washington, USA. 284pp. (C7)
14. State of Oregon. (OAR 340-041-0101). Basin-Specific Water Quality Criteria (Main Stem Columbia River) . Salem, Oregon
15. DEQ REMAP REPORT 2009
16. Zimmerman MP. 1999. Food habits of smallmouth bass, walleyes and northern pikeminnow in the lower Columbia River basin during outmigration of juvenile anadromous salmonids. Transactions of the American Fisheries Society. 128: 1036-1054
17. (Sanderson 2008 study) http://bioscience.oxfordjournals.org/content/59/3/245.full
18. Haskell CATiffanKFRondorfDW. 2006a. Food habits of juvenile American shad and dynamics of zooplankton in the lower Columbia River. Northwest Science80:47–64
19. Lassuy D. 1995. Introduced species as a factor in extinction and endangerment of native fish species. American Fisheries Society Symposium15: 391–396
20. Propst, D. L., K. B. Gido, and J. A. Stefferud. 2008. Natural flow regimes, nonnative fishes, and native fish persistence in arid-land river systems. Ecological Applications 18:1236-1252. (C3, C4)
21. Overfishing threatens biodiversity, trophic structure, productivity and resilience in freshwater and marine ecosystems around the world (Worm et al. 2009)
22. Enforcement number : 2016-016 pertaining to water quality and storm water --- The Port of Astoria was given notice of a civil penalty assessment for failing to collect monitoring data required in Schedule B of the permit 07/18/2016 http://www.portofastoria.com/ 07252016%20Special%20Session
23. http://www.dahrjamail.net/2018/10/08/the-end-of-ice
24. https://www.readcube.com/articles/10.7554/eLife.02245
25. https://ralphnaderradiohour.com/?powerpress_pinw=4478-podcast
26. https://science.sciencemag.org/content/sci/359/6378/908.full.pdf
27. https://aslopubs.onlinelibrary.wiley.com/doi/pdf/10.1002/lol2.10137
28. https://doi.org/10.1016/j.scitotenv.2020.136610
29.https://www.researchgate.net/publication/326063101_Tire_Abrasion_as_a_Major_Source_of_Microplastics_in_the_Environment
30. Oregon Department of Fish and Wildlife Fish Screening and Passage Program Priority Unscreened Diversion Inventory February, 2013Prepared By: Pete Baki Oregon Department of Fish and Wildlife Fish Screening and Passage White Paper 2019
https://www.dfw.state.or.us/agency/commission/minutes/19/04_Apr/Exhibit%20E/Attachment%202_2019%20Fish%20Passage%20Priority%20List%20White%20Paper.pdf
31. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3350522/pdf/pone.0036478.pdf
32. ***https://www.youtube.com/watch?v=ysa5OBhXz-Q***
33. https://soundcloud.com/user-995691545/joe-and-kathy-fallon-lambert-on-matscppace-and-public-health
34. https://eelp.law.harvard.edu/regulatory-rollback-tracker/
35. http://www.cbbulletin.com/404187.aspx
36. https://www.sciencedirect.com/science/article/pii/S0048969720301200?via%3Dihub