

Well, Dam! Rising Water Temperatures & The Challenge of Maintaining Traditional Chinook Fishing

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Introduction

Chinook salmon (*Oncorhynchus tshawytscha*), (Agia, Shoshone-Bannock) is a traditional medicine and food source for the Nez Perce and Shoshone-Bannock Tribes of Idaho. These are two of the five federally recognized tribes of Idaho, that still practice traditional fishing methods along the Columbia and Snake River; their fishing rights and use of traditional fishing methods were ensured by the Walla Walla Cayuse Treaty of 1855 (Nez Perce) and Treaty with the Eastern Band Shoshoni and Bannock, 1868 (Shoshone-Bannock). Unfortunately, Chinook salmon populations are dwindling due to Lower Granite Dam as well as, the seven other major dams the Chinook salmon must swim against along their journey to Idaho. How has the Lower Granite Dam effected Chinook salmon populations, and Nez Perce and Shoshone-Bannock Tribes fishing methods?

Analysis

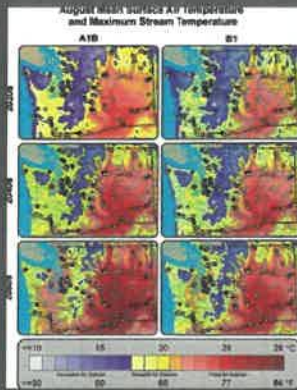
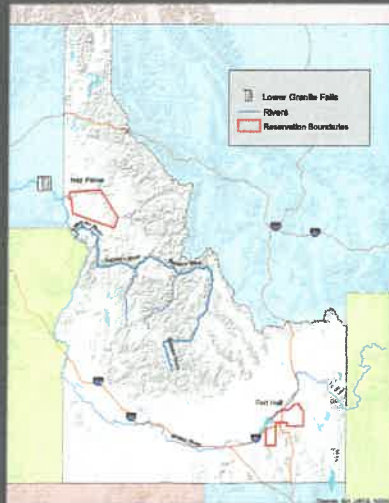
The Lower Granite dam is killing Chinook salmon populations because river flows are slowed, causing temperatures in the lower Snake River to rise. When temperatures rise, salmon will not move through warmer waters when migrating to their spawning grounds, this also elevates risks of mortality in both juveniles and adult salmon (Mantua, Tohver, and Hamlet 2010, 194, 195). Migrating patterns are changed due to rising water temperatures. (Crozier and Zabel 2006) Dams slow salmon down in two ways: first, they cause the salmon to use extra energy (their fatty reserves) that produces body heat which in return causes them to burn more energy; and secondly, it contributes to warmer water temperatures making it difficult to survive while migrating. When migrating through the dams, fish pass through a variation of water flows, but, slow moving water in reservoirs have the most negative impacts (Mantua, Tohver, and Hamlet 2010). Reservoirs are unnatural bodies of water that dams purposefully create. These reservoirs aid in rising water temperatures because of the slowed flows. Chinook salmon are not inherently created to travel through these slower warmer waters—and while they have and are adapting to this change, its effects are disturbing to their population. Man-made dams have significantly reduced populations of anadromous fish endangering their species as a whole around the globe (Baum, 1994; Meyers, 1994; Stolte, 1994) (Jackson and Marmulla 2001, 48-50).

Conclusion

The Nez Perce and Shoshone-Bannock Tribes are fighting for the Chinook salmon that are continuously subjected to deterrents because they are seen as a resource in our capitalistic society, rather than our relative that we must engage with reciprocity. Through these man-made technologies and the effects of rising temperatures from climate change, it will only be a matter of time before these two Indigenous Nations lose their traditional fishing methods, culture, medicine, and identity as fishing societies.

Possible Mitigation Ideas

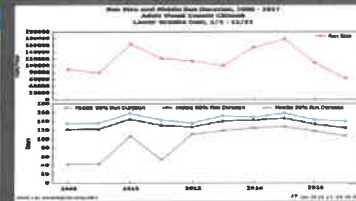
- Remove the Lower Granite Dam
- Tribes implementing wind farms to supplement for hydropower loss
- Tribes implementing solar farms to supplement for hydropower loss



Run Size Chart

The chart above shows 100% of the population that passed over Lower Granite between 2008 to 2017.

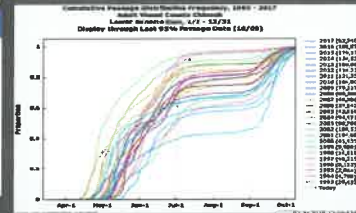
The lower portion of the chart depicts the percentage of the fishing migration season that has been recorded—tallying the total salmon population passing through at that given time.



Population Chart

This bottom chart shows the peak migration measured in months.

For example, 0.6 equates to 60%; which on average indicates that the population passed in July is about half of the expected total forecasted population at seasons end.



Chinook Salmon (*Oncorhynchus tshawytscha*)

Lower Granite Dam

- Built in 1975
- Hydropower, Gravity Dam
- 3-5% of Chinook population killed here
- All 8 Major Dams together = 22% Adult Chinook Mortality
- Provides only 3% of Idaho power

Traditional Fishing Methods

In the Treaty of Eastern Band Shoshoni and Bannock of 1868, it explicitly states in article 4, "they shall have the right to hunt on the unoccupied lands of the United States." This clause in the treaty only allows for Shoshone-Bannock Tribes to use spears when salmon fishing. Unlike the Shoshone-Bannock Tribes, the Walla Wall Treaty of 1855 guaranteed the Nez Perce's right to use gar hooks, dip netting, and gill nets as their traditional fishing methods.



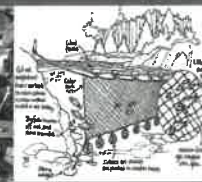
Shoshone-Bannock Tribal Members spear fishing



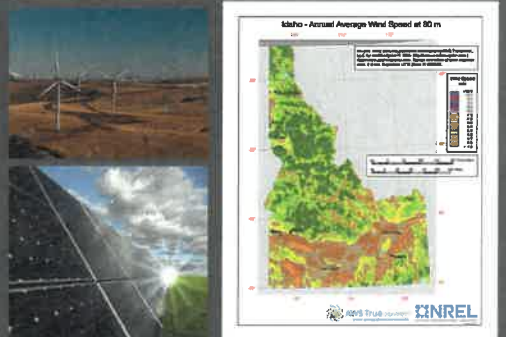
Gar Hook



Dip netting, CR, 1957



Gill Nets



Bibliography

- Columbia Basin Research. "Columbia Basin Research." *School of Aquatic & Fishery Sciences*. June 28, 2018. http://www.cbr.washington.edu/drc/wrapper?type=php&name=chart_adult_1530167782_836.php&days
- Bond, Morgan H., Peter A. H. Westley, Andrew H. Dittman, Dean Holecek, Tiffani Marsh, and Thomas P. Quinn. n.d. "Combined Effects of Barge Transportation, River Environment, and Rearing Location on Straying and Migration of Adult Snake River Fall-Run Chinook Salmon." *Transactions of the American Fisheries Society* 146 (1): 60–73. <https://doi.org/10.1080/00028487.2016.1235614>.
- Library, O.S. Indian Affairs: Laws and Treaties. Article 2, Pg. 695: "Walla Walla Cayuse Treaty of 1855." <http://dc.library.okstate.edu/digital/collection/kapplers/id/26536/rev/6>
- Library, O.S. Indian Affairs: Laws and Treaties. Article 2, Pg. 1020: "Treaty with the Eastern Band Shoshoni and Bannock, 1868." <http://dc.library.okstate.edu/digital/collection/kapplers/id/26536/rev/6>
- Dittner, Kyle. 2013. "Changing Streamflow on Columbia Basin Tribal Lands—Climate Change and Salmon." *Climate Change* 120 (3): 627–41. <https://doi.org/10.1007/s10584-013-0745-0>
- Colombi, Benedict. 2012. "The Economics of Dam Building: Nez Perce Tribe and Global-Scale Development." *American Indian Culture and Research Journal* 36 (1): 123–50. <https://doi.org/10.17953/aicr.36.1.51041847xp3452q0>.
- Polissar, Nayak, Anthony Salisbury, Kristin Callahan, Momi Nernadlick, Daniel Hippe, and William Beckley. n.d. "A Fish Consumption Survey of the Shoshone-Bannock Tribes." December 31, 2016. 331.

Acknowledgements

I would like to first thank the National Science Foundation (NSF, 0078563) and the Established Program to Stimulate Competitive Research (EPSCoR), for funding the research. Next, the HERS staff, Kansas University staff, KU geography department, Haskell Indian Nations University staff and mentors for always being helpful and assisting in my research project. Lastly, my cohort, friends, family for helping me with research and poster.