

Sex-Biased Harvest of Chinook Salmon at Babine Lake? Ancient DNA Evidence from Archaeological Salmon Vertebrae

Emmet Lee

Department of Archaeology, SFU

Supervisors: Dr. Dongya Yang, Dr. Hua (Grace) Zhang

Smokehouse Island, BC



Sex-selective fishing



Image from Atlas et al. (2021)

Male Sockeye



Image from Pacific salmon/steelhead identification and lifecycle (2023)



Image by Andrea Reid

Female Chinook



Image from Pacific salmon/steelhead identification and lifecycle (2023)



Image from Sitka Sound Science Center

1. Sample Prep



Vertebrae processed for DNA extraction

2. Extraction

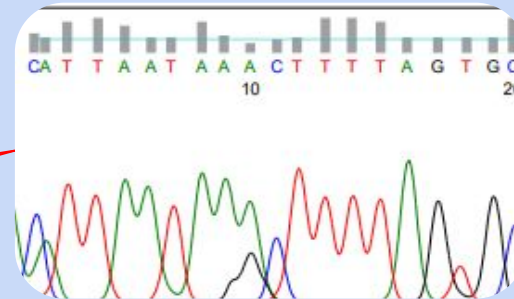
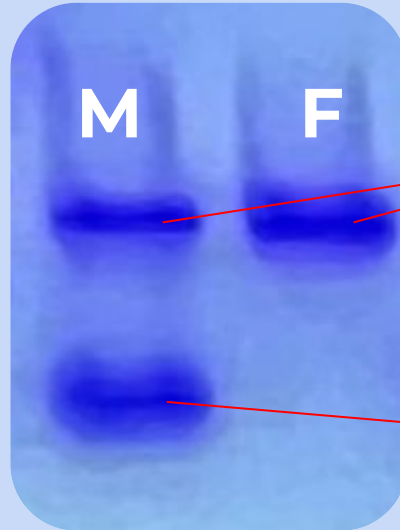


3. Amplification



Image from Applied Biosystems

4. Visualization



5. Analysis

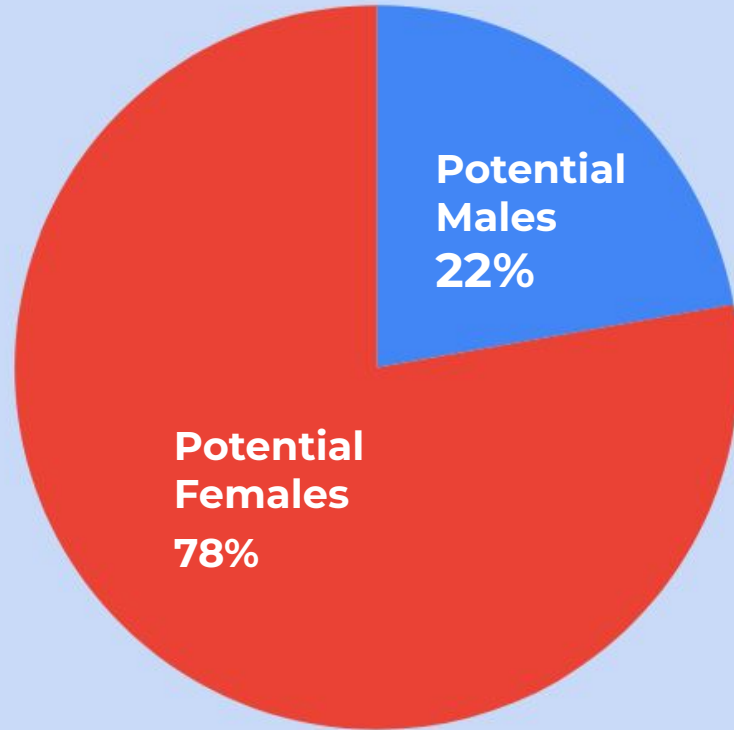
Species ID

Sex ID



Image from Pacific salmon/steelhead identification and lifecycle (2023)

All samples were
identified as Chinook
salmon



1

Support oral histories



2

Understand diversity



3

Inform commercial fishing



Acknowledgements

I would like to acknowledge the Lake Babine Nation for initiating and leading this project.

Thanks to Dr. Farid Rahemtulla of UNBC for making these samples available to Dr. Yang's aDNA lab.

Thanks to Ellery Procter for allowing to me to continue her research.

Thanks to all the lab members of the Yang aDNA lab.

Special thanks to Dr. Dongya Yang and Dr. Grace Zhang for their support.

References

Andrea Reid, *Drying Salmon*, 2024, photograph, Institute for the Oceans and Fisheries, <https://oceans.ubc.ca/2024/05/06/indigenous-data-sovereignty-and-conservation-in-british-columbia/>

Atlas, William I, Natalie C Ban, Jonathan W Moore, Adrian M Tuohy, Spencer Greening, Andrea J Reid, Nicole Morven, et al. 2021. Indigenous Systems of Management for Culturally and Ecologically Resilient Pacific Salmon (*Oncorhynchus* Spp.) Fisheries. *BioScience* 71(2):186–204. <https://doi.org/10.1093/biosci/biaa144>.

BC Salmon, *Troller*, photograph, BC Salmon, <https://www.bcsalmon.ca/how-we-fish>.

Bryant DeRoy, *Fish Weir*, photograph, Salish Sea Sentinel, <https://salishseasentinel.ca/2018/10/nation-revitalizes-traditional-fish-weir-to-man-age-salmon/>.

Lisa Conaway, *Salmon Eggs*, 2023, photograph, Sitka Sound Science Center, <https://sitkascience.org/salmon-eggs/>.

Pacific salmon/steelhead identification and lifecycle. BC Fishing Journal (2023). <https://www.bcfishingjournal.com/project/pacific-salmon-species-identification/>

Procter, Ellery T. Understanding Traditional Salmon Fishery of Ancestral Lake Babine Nation People through the Ancient DNA Analysis of Archaeological Salmon Remains (*Oncorhynchus* Spp.).

Rahemtulla, Farid. 2019. The Babine Archaeology Project: Discovery of a Rare Wet Site on the Babine River, North-Central British Columbia. In *Waterlogged: Examples and Procedures for Northwest Coast Archaeologists*, pp. 159–168. Washington State University Press.

Royle, Thomas C. A., Dionne Sakhrani, Camilla F. Speller, Virginia L. Butler, Robert H. Devlin, Aubrey Cannon, and Dongya Y. Yang. 2018. An Efficient and Reliable DNA-Based Sex Identification Method for Archaeological Pacific Salmonid (*Oncorhynchus* Spp.) Remains. Edited by David Caramelli. *PLOS ONE* 13(3):e0193212. <https://doi.org/10.1371/journal.pone.0193212>.