

## **Estimating and characterizing escapement of *Oncorhynchus tshawytscha* Pacific Chinook salmon in the Chena and Salcha rivers of Fairbanks, Alaska**

Pacific king (or Chinook) salmon (*Oncorhynchus tshawytscha*) are highly known for their extreme size and delicious taste, and because of that, the species have been declining at a steady rate from overfishing since the late 1800s, effecting their population and the people along the Pacific coast that rely on them for food. The Chena and Salcha rivers of Fairbanks, Alaska supports two of the largest king spawning populations in Alaska from the Yukon river. Collecting age, sex, length, and count variables from the run provides fishery agencies characteristics of the population to further understand the species and determine if regulations need to be set in order for the population to increase, decrease, or stabilize. Using sonars and carcassing surveys, these characteristics of the run were collected in the summer of 2018 and compiled with a dataset comprised of similar data from the previous 25 years of the run from the Alaska Department of Fish & Game, Sport Fish division. Compiling this continuous dataset allowed for analysis on the king population to determine how the run was changing over time and by what factors. King salmon were shown to be decreasing significantly over time, but with no significant differences between the two rivers, in the age proportions they return, or in the sex ratios over time. The lengths of males and females were significantly different between the two rivers and between each other, in that males from the Chena river were significantly larger than males from the Salcha, and vice-versa for the females. These results provide evidence that the population is changing in different ways overtime and it is essential for fisheries to implement a policy in order to increase the king salmon population again. Oceanic factors may be the primary reason in the physical differences of the salmon run, in that they spend almost the entirety of their lives in the ocean before returning to freshwater to reproduce.

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