



AYK SUSTAINABLE SALMON INITIATIVE

Project Synopsis

KUSKOKWIM RIVER WATERSHED



(Dave Folletti)

PROJECT 725

PRINCIPAL INVESTIGATOR

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Wildlife Service*

CONTRIBUTING ORGANIZATIONS

*Alaska Department
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*National Oceanic
and Atmospheric
Administration*

*United States
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RESEARCH PERIOD

May 2007 -
March 2010

BUDGET

\$226,628.00

WORK-IN-PROGRESS HERITABILITY OF TRAITS IN WILD CHINOOK SALMON

SIZING UP CHINOOK SALMON

Many Chinook salmon in the Kuskokwim River are harvested in the subsistence fishery using “large mesh” (8 inches or larger) gillnets. This mesh size avoids unintentional harvest of smaller, more abundant species but preferentially captures older and larger Chinook salmon. There is interest in determining if this selective fishery has a population-level impact on traits such as adult size and age. Realistic estimates of trait heritability are needed to fully evaluate this. This selective fishery may also be indirectly influencing abundance if reproductive success is greater for larger fish. To study this issue, estimates of family size for a sample of parents of known length are needed. The results of this study will provide salmon fishers and fishery managers a better understanding of the possible impacts of a size selective harvest on Chinook salmon.

OUR OBJECTIVES

To be able to estimate the heritability of adult size, growth rate, age-at-maturation, and the genetic covariance among these traits in male and female Tuluksak River Chinook salmon.

To be able to determine if the variation in family size is random, and if not, determine if family size is related to the size of the adult parent.

HOW WE WILL DO IT

We plan to sample approximately 1,000 Chinook salmon

**RESEARCH
FRAMEWORK:**
SALMON LIFE CYCLE –
PRIORITY #3

SNAPSHOT

This project will sample Chinook salmon on the Tuluksuk River to determine whether selective fishing using large mesh size nets is affecting the composition of the population. Genetic analysis will be used to determine the heritability of certain traits and reconstruct family groups to understand the relationship of family size to parental size.



Map of the lower Kuskokwim River drainage showing the location of the Tuluksak River weir. (Olsen, USFWS)

from the Tuluksak River in each of three years from 2007 to 2009 in order to study trait heritability and family size in the 4- to 6-year-old adults born in 2003. The samples will make possible the evaluation of family size and the influence of parent size on reproductive success. Samples will be collected at the Tuluksak River weir and from post-spawning adults taken above the weir. We will use scales and otoliths to determine ages. The scale and otolith data will allow for a comparison of growth rates between cohorts and age classes. We will take tissue samples for genetic analysis. We will use computer programs to reconstruct family groups and estimate genetic variance.

REPORT COMPLETION

December 2010



(Jeffrey B. Olsen)

***AYK SSI Mission:** To collaboratively develop and implement a comprehensive research plan to understand the causes of the declines and recoveries of AYK salmon.*

ARCTIC-YUKON-KUSKOKWIM SUSTAINABLE SALMON INITIATIVE

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