



AYK SUSTAINABLE SALMON INITIATIVE

Project Synopsis

KUSKOKWIM RIVER WATERSHED



(Greg T. Ruggerone)

PROJECT 805

PRINCIPAL INVESTIGATOR

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Consultants, Inc.*

CONTRIBUTING ORGANIZATION

*Alaska Department
of Fish and Game*

RESEARCH PERIOD

May 2008 -
March 2010

BUDGET

\$76,659.00

SALMON AND SATELLITES

The Kuskokwim River is the second largest watershed in Alaska and relatively little information is available on growth of juvenile coho salmon in relation to habitats in tributaries of the Kuskokwim River and Kuskokwim Bay. Growth of juvenile coho salmon, which typically inhabit freshwater for two growing seasons, likely reflects the quality of the watershed in which they live. Salmon growth is key to their survival. Growth information is important because threats to salmon habitat, such as mining, may continue or possibly increase in the future.

OUR OBJECTIVES

Reconstruct annual growth of juvenile coho salmon originating from eight tributaries in the Kuskokwim area, and compare these measurements with watershed habitat characteristics to determine which features contributed to growth.

Compare smolt size of Kuskokwim area coho salmon with that from other regions of Alaska, British Columbia and Russia.

HOW WE DID IT

We measured growth rings on adult salmon scales collected on eight Kuskokwim area tributaries from 2003 to 2007. We also developed a relationship between juvenile coho salmon length and the radius of their scale so that juvenile length could be back-calculated from

RESEARCH FRAMEWORKS:

SALMON LIFE CYCLE –
PRIORITY #1;

SYNTHESIS &
PREDICTION –
PRIORITY #7

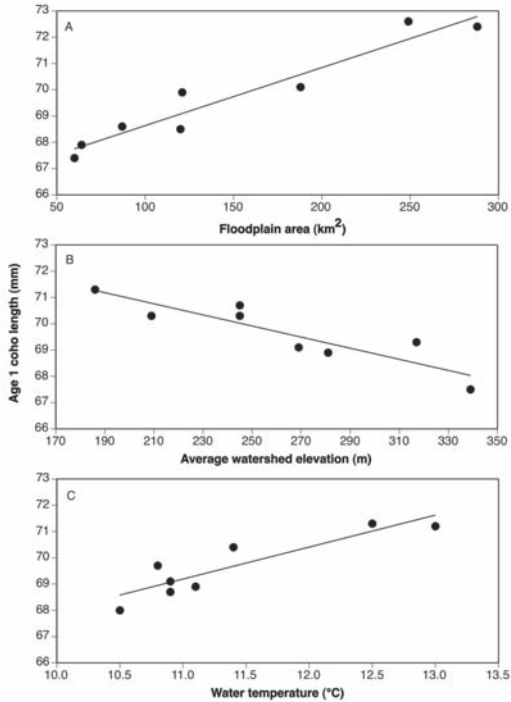
SNAPSHOT

How can salmon growth be compared with habitat across the Kuskokwim, a huge region of Alaska? The answer lies in adult salmon scales and remote-sensing satellites.



(Greg T. Ruggerone)

$$\text{Length (mm)} = 58.22 + 0.022 (\text{Floodplain}) - 0.021 (\text{Elevation}) + 1.21 (\text{Temperature})$$



Relationship between annual mean length of juvenile coho salmon after one year in freshwater and the following watershed characteristics: A) floodplain habitat area, B) average watershed elevation, and C) average summer water temperature. (Ruggerone, NRC)

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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the measurements of adult scales. Next, we obtained habitat data for each watershed collected from satellites in space (University of Montana, Flathead Biological Station), and measured water temperature using a data logger. Smolt sizes from other regions were obtained from the literature.

WHAT WE DISCOVERED

Growth in freshwater is likely a key factor contributing to the relatively great abundance of coho salmon in the Kuskokwim area. The amount of floodplain habitat (for example, old river oxbows) was the primary factor influencing growth of coho salmon, indicating the need to protect this type of habitat. Water temperature and the presence of pink salmon (prey) also affected growth. Coho salmon smolts were relatively large compared with smolts from other regions of Alaska, British Columbia and Russia suggesting growth may be a key factor leading to high abundance of coho salmon in the Kuskokwim area.

PRODUCTS AND OUTREACH

A technical report was prepared and is available online. Findings were presented at three meetings involving communities from western Alaska, and two scientific conferences.

WHAT'S NEXT?

We plan to continue exploration of factors affecting coho salmon growth in freshwater and the ocean as a means to evaluate factors influencing survival and abundance of Kuskokwim area coho salmon.