



AYK SUSTAINABLE SALMON INITIATIVE

Project Synopsis

KUSKOKWIM RIVER WATERSHED



(Megan V. McPhee)

PROJECT 802

PRINCIPAL INVESTIGATOR

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CONTRIBUTING ORGANIZATIONS

University of Montana
University of Washington

RESEARCH PERIOD

June 2008 -
March 2011

BUDGET

\$177,661.00

WORK-IN-PROGRESS ECOTYPIC VARIATIONS IN KUSKOKWIM RIVER SOCKEYE SALMON STOCKS

HOW STABLE ARE SOCKEYE SALMON RUNS?

Year-to-year fluctuations in salmon run sizes cause difficulty for fishery managers and fishers trying to anticipate returns. Recent evidence from Bristol Bay has shown that “biocomplexity” contributes to regional sockeye salmon run stability. In this fishery, runs are composed of multiple local populations with diverse life-history and physical characteristics adapted to their specific spawning areas. Because of this high diversity, each local population responds individually to annual variation in climate, weather, and local feeding and growing conditions; some increase and some diminish, but the overall run size remains relatively stable. Because of the growing importance of sockeye salmon in the Arctic-Yukon-Kuskokwim region, it is important to determine whether such population diversity can contribute to run stability there as well.

OUR OBJECTIVES

Characterize ecological and genetic diversity within and between sockeye salmon spawning populations in the Kuskokwim River drainage—specifically in the upper Holitna and Stony River/Telaquana Lake regions.

Identify physical features of spawning habitat, and quantify environmental complexity within and between spawning locations.

Use our data to compare ecological and genetic differentiation with geographic distance and

RESEARCH FRAMEWORK:
SYNTHESIS &
PREDICTION –
PRIORITY #10

SNAPSHOT

This project will collect information on the ecological and genetic diversity of Kuskokwim River sockeye salmon populations. Researchers will measure adult sockeye salmon morphology and genetics in several river and lake spawning areas, as well as the environmental characteristics of those areas.

Results will be compared with Bristol Bay to determine if similar factors can be expected to contribute to run stability in the Kuskokwim River.



(Dave Cannon)



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***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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environmental complexity in the Kuskokwim River drainage and Bristol Bay.

HOW WE WILL DO IT

We plan to record and sample four to five spawning areas during each of two field seasons. The first season will focus on the upper Holitna River (river-type sockeye salmon), the second on Telaquana Lake (lake-type sockeye salmon). We plan to collect up to 100 adults from each aggregation, anesthetize and photograph them, collect various body measurements, collect a fin sample for genetic analysis, and take a small egg sample. At the end of the spawning period, we will return to these areas to collect otoliths for age and sex data. We will also use historic data when available. We will use 16 microsatellite DNA markers to analyze population differences. In each spawning area, we will collect data on temperature, and intergravel and surface hydraulic flow, and conduct sediment-size profiles in the river areas. We will use statistical analysis to compare our information with similar data from Bristol Bay.

REPORT COMPLETION

May 2011