



AYK SUSTAINABLE SALMON INITIATIVE

Project Synopsis

KUSKOKWIM RIVER WATERSHED



(Sara E. Gilk)

PROJECT 409

PRINCIPAL INVESTIGATOR

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of Fish and Game*

RESEARCH PERIOD

May 2004 -
April 2005

BUDGET

\$71,036.00

CHARACTERISTICS OF KUSKOKWIM RIVER FALL CHUM SALMON

FALL CHUM SALMON STAND APART

Since the mid-1990s, fisheries managers have known that the Kuskokwim River hosts a run of fall chum salmon that were genetically distinct from the more common summer chum salmon population, and whose spawning distribution seemed limited to the upper Kuskokwim River; otherwise, little was known about the fall population. Harvest statistics do not distinguish between the two populations. Escapement monitoring is conducted for summer chum salmon but not fall chum salmon. Low chum salmon run abundance prompted the Alaska Board of Fisheries in 2000 to designate Kuskokwim River chum salmon as a “stock of concern,” but no distinction was made between summer and fall populations. Without more information about the fall run, it is difficult for managers to assess the effects of conservation measures on this population.

OUR OBJECTIVES

Address the information gap by describing some key characteristics of Kuskokwim River fall chum salmon in comparison with summer chum salmon. Specifically, we wanted to compare age and sex composition, morphological features, fecundity, spawning distribution, lower river run timing, and relative abundance.

HOW WE DID IT

We captured 1,964 summer chum salmon at weirs on the Kwethluk, George, and Takotna rivers, and 336

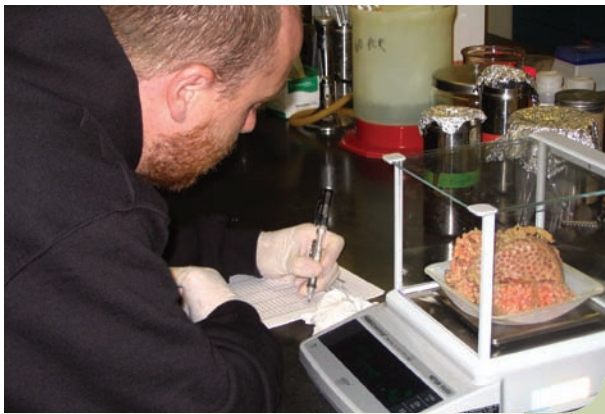
RESEARCH

FRAMEWORK:

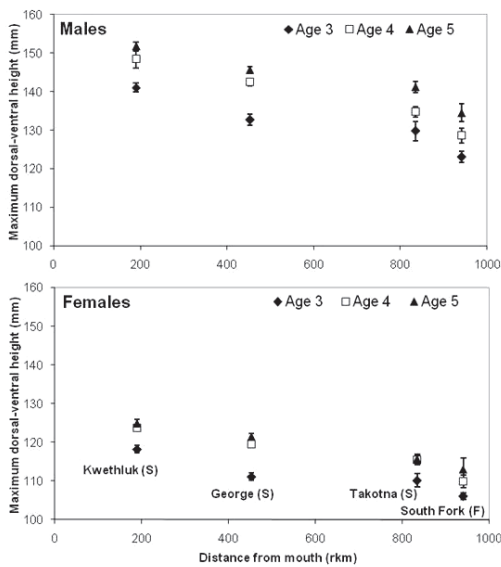
SALMON LIFE CYCLE –
PRIORITY #2

SNAPSHOT

This project compares characteristics of fall and summer chum salmon populations in the Kuskokwim River. Differences were found in age composition, morphological characteristics, run timing, and spawning distribution, but not in sex ratios or fecundity.



(Sara E. Gilk)



Relationship between migration distance and average maximum width for male and female Kuskokwim River summer and fall chum salmon, 2004. (Gilk, ADF&G)

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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fall chum salmon captured at a fish wheel located on the South Fork Kuskokwim River to compare age and sex composition, morphological features, and fecundity. We also summarized historical aerial survey data to compare spawner distribution of the two populations, and used single nucleotide polymorphisms (SNPs) as genetic markers to estimate run timing and relative abundance from mixed-stock samples collected from fish wheels operated near the Kalskag, in the lower Kuskokwim River.

WHAT WE DISCOVERED

Fall chum salmon had significantly more age 0.2 (zero winters in freshwater/two winters at sea) fish than any summer population, but no differences were found in sex ratios or fecundity. Fall chum salmon tended to be longer and thinner than summer chum salmon but differences were not so profound as to make the two populations easily distinguishable in a mixed-stock setting. Also, these morphological differences may not translate to fish more distant from the spawning areas, such as those harvested in the lower Kuskokwim River commercial fishery. Genetic analysis showed that fall chum salmon composed only a small proportion of the mixed-stock samples collected from the Kalskag fish wheels, and that fall chum salmon were present early in the overall chum salmon run passing Kalskag. Greater resolution about run timing may be achieved through analysis of archived samples. Finally, spawning distribution of fall chum salmon appears to be confined to side-channels of large glacier-fed upper Kuskokwim River tributaries such as Big River and the South Fork Kuskokwim River, while summer chum salmon spawn in small to large tributaries of the lower and middle Kuskokwim River.

PRODUCTS AND OUTREACH

We presented our findings at several national and regional meetings, including meetings that target diverse audiences of Kuskokwim area residents. We published our findings in a technical report and in a collection of symposium proceedings.

WHAT'S NEXT?

Future investigations should incorporate additional Kuskokwim River fall chum salmon populations, compare physical attributes of fall and summer chum salmon spawning habitats, and conduct mixed-stock genetic analysis of fish caught in the lower Kuskokwim River commercial fishery to determine run timing and relative contribution of fall chum salmon.