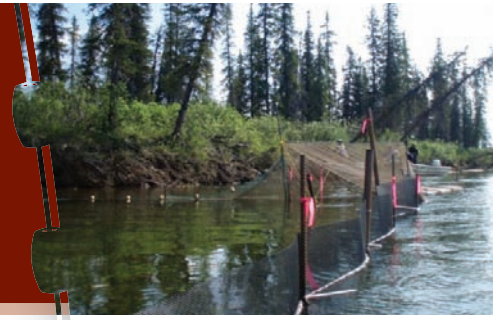




# AYK SUSTAINABLE SALMON INITIATIVE

## Project Synopsis

### NORTON SOUND AREA



(NSED staff)

## WORK-IN-PROGRESS TESTING HABITAT-BASED PRODUCTION MODELS FOR COHO SALMON IN THE FISH RIVER

### PROJECT 804

#### PRINCIPAL INVESTIGATOR

Charlie F. Lean  
Norton Sound  
Economic Development  
Corporation

#### CONTRIBUTING ORGANIZATION

LGL Alaska Research  
Associates, Inc.

#### RESEARCH PERIOD

May 2008 -  
March 2011

#### BUDGET

\$413,649.00

#### USING HABITAT TO PREDICT PRODUCTION

There are currently no biological escapement goals for coho salmon in Norton Sound watersheds. The Fish River was slower to rebound from area-wide declines of coho salmon returns in 2003, which led to concern that an increase in harvest pressure was not sustainable. Recent research in the Nome River indicates habitat-based models can accurately predict the range of smolts produced by a river and the subsequent number of adults necessary to produce the smolts. If such relationships apply to other Norton Sound rivers, it may be possible to use habitat to predict smolt production, and then use the smolt production estimate to compute adult coho salmon escapement goals.

#### OUR OBJECTIVES

Determine if coho salmon smolt (and subsequent adult) production can be predicted from indicators of watershed size among watersheds with contrasting habitat quantity and type. Specifically, to predict and verify coho salmon smolt production from two areas of the Fish River watershed with contrasting habitat, and estimate the number of adult salmon needed to produce both the predicted and the observed numbers of smolts.

Estimate in-river smolt survival, marine survival, and winter habitat loss as possible factors to help explain any discrepancies between our predictions and actual production.

#### RESEARCH FRAMEWORK:

SALMON LIFE CYCLE –  
PRIORITY #1

#### SNAPSHOT

This project will identify and characterize coho salmon rearing habitat in the Fish River to create a model predicting smolt and adult production. Statistical models will be verified with a mark-recapture study, and likely factors contributing to the differences between predicted and actual values will be investigated.



(NSEDC staff)



(NSEDC staff)



(NSEDC staff)

*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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## **HOW WE WILL DO IT**

We will use topographical maps to identify the distribution of potential coho salmon rearing habitat within the Fish River. We will conduct field surveys at selected areas to verify our assumptions. We will use statistical models to predict coho salmon smolt abundance from the entire watershed and from each of the two major branches. We will test our estimates using a two year mark-recapture study, and use the resultant smolt estimates in a life-cycle model to determine the necessary adult escapement. We will examine predators (northern pike, Dolly Varden) for a qualitative estimate of predation on coho salmon smolts, and will use coded wire tag smolts for an estimate of marine survival. We will fly the Nome, Fish, and Niukluk rivers to conduct a qualitative assessment of open water areas in winter to identify obvious departures from our model caused by loss of winter habitat.

## **REPORT COMPLETION**

*May 2011*