

EVOS ANNUAL PROJECT REPORT

Project Number: G-050765

Project Title: Management Applications: Improving Preseason Forecasts of Kenai River Sockeye Salmon Runs through Smolt Monitoring - Technology Development

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Time Period Covered by Report: October 1, 2004 – September 30, 2005

Date of Report: August 15, 2005

1. **Work Performed:** In early May 2005, we installed an acoustic system and two inclined-plane smolt traps in the Kenai River near its confluence with the Killey River. The acoustic system consisted of echosounders, two uplooking transducers and a side-looking transducer. Smolt traps were constructed after a design described by Todd (1994), but one of the traps was scaled up 1.5 times in size. The equipment was operated from early May through late June during which trap efficiency tests were conducted each week. Fish for efficiency tests were generally captured using a fyke net deployed in the Kenai River approximately 5 km downstream of Skilak Lake. Although population size has not yet been estimated, preliminary results indicate that the acoustic system provided useful information regarding the cross-channel and vertical distribution of migrating smolt, which was used to optimize the deployment and operation of smolt traps. Smolt captured for trap efficiency tests in the fyke net were often much larger than those captured in the inclined-plane traps, confirming that these traps are size-selective. Use of fyke nets for trap efficiency experiments is expected to minimize bias in the population estimates caused by size-selectivity of the inclined-plane traps. The larger (1.5x) trap often captured ten times more fish than the smaller trap, confirming that a larger trap is needed to achieve high trap efficiencies and more precise population estimates. Few problems (i.e. inability to hold the traps in the current or large debris) were encountered during trap operation, but traps needed to be cleaned frequently in June to prevent accumulation of algae, which could affect trap efficiency. We are currently in the process of archiving, editing, and properly documenting the acoustic and fisheries data collected this year.

2. **Future Work:** We do not anticipate any changes to the work proposed in our study plan for the upcoming year.

3. **Coordination/Collaboration:** This project is part of ongoing ADF&G investigations into the ecological system supporting production of sockeye salmon in the Kenai River watershed. The ADF&G has continued to annually measure light penetration, temperature, zooplankton species composition and biomass, and juvenile sockeye salmon population size and whole-body energy content in Skilak Lake. These data are being used to develop a bioenergetics model for over-wintering juvenile sockeye salmon in the system. The results of this smolt monitoring project will be used to validate the over-winter bioenergetics model by providing estimates of overwinter mortality. This project also collected several hundred samples of sockeye salmon smolt and other juvenile salmonids for analysis of their proportion of marine

derived elements (C, N, S). Laboratory analyses of these samples will be accomplished through a contract.

4. **Community Involvement/TEK & Resource Management Applications:** Project results are expected to be used in developing annual sockeye salmon forecasts for the Kenai River, which will be described in any press releases or public communications regarding upper Cook Inlet salmon forecasts. However, since we are currently developing methodologies, it is premature to use any smolt population estimates to forecast adult returns at this time.

5. **Information Transfer:** The project principal investigator will present a poster at the national American Fisheries Society meeting to be held in Anchorage this September. The poster will describe our investigations of sockeye salmon production in the Kenai River watershed including this project. We are currently in the process of archiving, editing, and properly documenting the data collected this year.

6. **Budget:** Expenditures to date and those anticipated through project completion remain within allocated budget.

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Project Web Site Address: n/a_____

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