



## MEMORANDUM

TO: Tracy Lingnau, Regional Supervisor  
Division of Commercial Fisheries

DATE: February 9, 2017

FROM: Mark Willette, Area Research Biologist  
Division of Commercial Fisheries

SUBJECT: Smelt (Eulachon)  
Spawning Biomass  
Assessment in the  
Susitna River, 2016

In 2016, the Alaska Department of Fish and Game (department) conducted the first year of an anticipated three-year study to estimate the run timing, age, sex and size composition and biomass of smelt or eulachon (*Thaleichthys pacificus*) spawning in the Susitna River watershed during May and June. Although, anecdotal information indicates eulachon are abundant in the Susitna River watershed, the total biomass of the run has not been estimated. The Alaska Board of Fisheries (board) has authorized a 100 ton annual commercial harvest of eulachon in northern Cook Inlet most of which is taken in the lower Susitna River. Although, the department believes this harvest level is a very small fraction of the total eulachon population, estimates of the actual harvest rate are not available. Due to their high densities and lipid content, eulachon are also an important food source for endangered Cook Inlet beluga whales (*Delphinapterus leucas*) during spring when their energy reserves are low.

The 2016 estimates of abundance and biomass for eulachon spawning in the Susitna River were calculated indirectly from estimates of larval densities and stream discharge data collected from May 12th to July 6th. During this time period, larval eulachon densities were estimated on a weekly basis from net tows conducted downstream of the confluence of the Yentna and Susitna rivers. The larval densities were then integrated with stream discharge measurements to estimate larval production exiting the Susitna watershed. Adult eulachon biomass was then estimated from the total number of larvae, estimated survival from egg to larvae, mean fecundity of female eulachon, mean female body weight, the sex ratio of males to females, and mean male body weight.

Preliminary estimates are available from the first year of the study. Simulation model results indicated the most probable total eulachon biomass in 2016 was 48,000 tonnes (95% CI: 29,000–127,000 tonnes). Based on this, the current commercial harvest level of 100 tons (90.7 tonnes) equates to harvest rate of approximately 0.2% (95% CI: 0.1%–0.3%).

This study will be repeated in 2017 and 2018 if the department is successful obtaining external funding from the National Fish and Wildlife Foundation (2017) and National Marine Fisheries Service (2018).