## F-S6: COOK INLET BELUGA WHALE ANADROMOUS PREY ANALYSIS - DRAFT

### INTRODUCTION

The Alaska Energy Authority (AEA) is preparing a License Application that will be submitted to the Federal Energy Regulatory Commission (FERC) for the Susitna-Watana Hydroelectric Project (Project) using the Integrated Licensing Process (ILP). The Project is located on the Susitna River, an approximately 300 mile long river in the Southcentral region of Alaska. The Project's dam site will be located at River Mile (RM) 184. The results of this study and of other proposed studies will provide information needed to support the FERC's National Environmental Policy Act (NEPA) analysis for the Project license.

The Distinct Population Segment (DPS) of Cook Inlet beluga whales are protected by the National Marine Fisheries Service (NMFS) as an endangered species under the Endangered Species Act (ESA). Habitats in upper Cook Inlet, including the Susitna River delta, have been designated as critical habitat for this DPS (Figure 1). Anadromous fisheries resources in Cook Inlet including eulachon, and Chinook, sockeye, chum, and coho salmon are among the primary constituent elements of Cook Inlet beluga whale critical habitat.

Construction and operation of the Project as described in the Pre-application Document (PAD; AEA 2011) will affect habitats used by sockeye, chum, and coho salmon in the middle and upper reaches of the Susitna River and could affect habitats in the lower river used by eulachon. Access roads and transmission line routes could cross streams used by Chinook, sockeye, chum, and coho salmon. This study plan outlines the objectives and methods for characterizing potential Project-related changes in habitat and productivity for these fishes that could indirectly affect beluga whales. This study initiates a multi-year effort, which will include data synthesis beginning in 2012.

### STUDY OBJECTIVES

This study consists of a literature and data review of use of the Susitna River by Cook Inlet beluga whale and their important prey species (eulachon and salmon) that incorporates and builds upon the information developed in the PAD. The overall study objectives are to:

- Summarize life history, run timing, abundance, distribution, and habitat of beluga whale prey species (eulachon and salmon) in the Susitna River;

- Summarize temporal and spatial distribution of beluga whales in Cook Inlet, the Susitna River delta, and the Susitna River relative to the availability of eulachon, Chinook, sockeye, chum, and coho salmon;

- Identify potential Project-induced changes that could impact beluga whale habitat, critical data gaps, and develop 2013-2014 study plans.

Existing information on salmon species will be compiled under F-S1, Synthesis of Existing Fish Population Data, and additional data will be collected during F-S2, Susitna River Salmon Run

Apportionment Study, and F-S3, Middle River Habitat Utilization Study. The Cook Inlet Beluga Whale Anadromous Prey Analysis will focus on compiling and synthesizing life history and use information for eulachon and Cook Inlet beluga whales.

## STUDY AREA

The study area consists of the Susitna River within anadromous fish distribution, with an emphasis on the lower river and the Susitna River delta that could be affected by Project operations. Escapement and run timing data will also be compiled for other Cook Inlet tributaries where significant salmon and/or eulachon predation by beluga whales occurs.

## EXISTING INFORMATION

Aerial surveys for beluga whales were completed in 1982 and 1983 as part of the original licensing effort (Harza-Ebasco 1985). Annual aerial surveys are completed each June and July by the NMFS to monitor the beluga whale population in Cook Inlet (NMFS 2012). These surveys all recognize the summer aggregations of belugas in the Susitna River delta that have been consistently documented by aerial surveys and telemetry studies by NMFS (NMFS 2008). In addition, whale movement and habitat use studies using satellite telemetry and hydrodynamic modeling indicate that beluga distributions are controlled not only by water temperature and ice coverage, but also by the seasonal flow patterns of various rivers. This suggests that availability of salmon and other fish in river mouths influence beluga movements (Ezer 2011). Beluga whales primarily use the Susitna River delta from late-April or early May, coincident with the presence of eulachon and the first Chinook salmon runs. Whale use of the delta area continues through the summer and into September, as belugas forage on salmon during spawning runs (NMFS 2008).

The Susitna River delta area is a high subsistence use area for the Tyonek beluga whale harvest (SRB&A 2007). However, subsistence harvest rates have been regulated since 1999 with five beluga whales harvested between 1999 and 2008. The beluga population has been below the harvestable level of 350 since 2009 (NMFS 2012).

Preliminary data from studies of eulachon in the 1980s indicate that their spawning requirements are broad and that most spawning occurs below RM 28, but some spawning activity can be found as far upstream as RM 50 (HDR 2011). Eulachon, also known as smelt or hooligan, may be commercially harvested in the salt waters of the Upper Cook Inlet between the Chuit and Little Susitna Rivers from May 1 to June 30 using a hand operated dip net; the harvest is not allowed to exceed 100 tons (ADF&G 2012). Harvest rates over the period 2006 to 2010 averaged 55 tons (Shields 2010). As indicated by the Aquatic Resources Data Gap Analysis (HDR 2011), existing information about Susitna River eulachon has not been synthesized.

ADF&G has conducted ongoing salmon escapement studies in the Susitna River drainage basin including: helicopter and foot surveys to index counts of Chinook salmon; coho escapement surveys; and coho and chum salmon telemetry studies. Study F-S2: Susitna River Salmon Run Apportionment Study describes additional capture and tagging efforts on the Susitna River near

Sunshine (RM 80), Talkeetna (RM 103), and Curry (RM 120.6) that will augment ADF&Gs telemetry studies of chum and coho salmon and will also mark Chinook and pink salmon.

## METHODS

Methods for this study include further identification, compilation and synthesis of existing published and gray literature and data on Susitna River eulachon, salmon, and Cook Inlet beluga whales building on information in the PAD. Beluga whale information and data will focus on historical and current beluga whale use and seasonal distribution within the Susitna River delta and the Susitna River. Information on Susitna River salmon escapement, run timing and distribution is being compiled and investigated concurrently under Project licensing studies that will be completed by ADF&G and other AEA-selected environmental consultants.

*Task 1: Review and Compile Existing Eulachon and Salmon Information for Assessments*

1. Identify, compile and review literature to describe life history and habitat requirements of eulachon in glacial river systems.

2. Synthesize all available data on the local eulachon fishery and Susitna River eulachon escapement, life history and distribution.

   a) Document key habitat requirements (e.g. stream temperatures, stream flows) for critical periods including spawning (late April through June) and outmigration (June through August).

   b) Identify remaining data gaps and evaluate the potential for Project impacts on eulachon and salmon habitat to determine future study needs.

3. Compile existing escapement and run timing data for the anadromous species within other Cook Inlet tributaries used by the beluga whales that also use the Susitna River and delta.

*Task 2: Review and Compile Existing Beluga Whale Information for Assessments*

1. Compile temporal and spatial distribution data for Cook Inlet beluga whales in and around the Susitna River and Susitna River delta, especially during spawning periods of Susitna River eulachon, Chinook, sockeye, chum and coho salmon.

2. Compile temporal and spatial distribution data for Cook Inlet beluga whales within their range during spawning periods for eulachon, Chinook, sockeye, chum, and coho salmon.

3. Identify potential Project-induced impacts to beluga whale habitat; synthesize relevant existing information and identify critical data gaps. Identify data needs for 2013-2014 studies and develop study plans.

## ANALYSIS

All of the references and data gathered will be summarized and critical data gaps will be identified. General patterns of temporal and spatial comparisons between beluga whale distributions and anadromous fish runs in the Susitna River will be summarized based on existing data and literature.  Potential Project impacts to the Susitna River anadromous fish production and run timing will be evaluated to define and refine future studies. The relative contribution of Susitna River-origin eulachon and salmon to the overall Cook Inlet beluga whale prey base will be characterized.

The documented upper extent of beluga whale distribution within the mainstem Susitna River will be determined.  The temporal and spatial distribution of beluga whales within the Susitna River and the delta will be related to discharge, at a minimum.

## NEXUS BETWEEN PROJECT AND RESOURCE TO BE STUDIED AND HOW THE RESULTS WILL BE USED

Cook Inlet beluga whales could be impacted by potential Project-induced changes to the abundance, productivity, and run timing of important Susitna River prey species: eulachon, and Chinook, sockeye, chum, and coho salmon. Project-induced changes to discharge and water levels may impact beluga whale access to the river and/or to available prey. The Cook Inlet beluga whale DPS is protected by the NMFS as both a depleted stock under the Marine Mammal Protection Act, and as an endangered species under the ESA; and habitats in upper Cook Inlet, including the Susitna River delta, have been designated as critical habitat for the Cook Inlet beluga whale (Figure 1).  Eulachon and Chinook, sockeye, chum and coho salmon are identified as primary constituent elements of beluga whale critical habitat in Cook Inlet. Information on the relative contribution of Susitna River eulachon and salmon to the overall Cook Inlet beluga whale prey base will aid in understanding the significance of the Susitna River prey base.

This study addresses the following issue identified in the PAD (AEA 2011):

- F10:  Potential impacts to the Endangered Cook Inlet beluga whale.

Several studies will be conducted to evaluate the impacts of Project-related changes to sediment transport and delivery, stream temperature, water quality, stream flow, and ice processes on salmon habitat, productivity, abundance and run timing. This study will synthesize the available information on eulachon to understand how the Project may affect the species in the Susitna River and identify data gaps to inform future studies. The temporal and spatial distribution of beluga whales within the Susitna River will be used to inform the assessment area of 2013-2014 studies that will evaluate the influence of discharge on water levels with consideration of tidal influence.

## PRODUCTS

Study products to be delivered in 2012 will include:

**Development of final 2012 study plan**. The 2012 component of the study will be developed with input from AEA and consideration of comments already received from the agencies and

other licensing participants. The AEA-selected environmental consultant will assist AEA, the Program Lead, and the licensing participants develop the final study plans.

**Draft Technical Memoranda**. Draft technical memoranda will be prepared for each work group meeting.  The topics for the draft memoranda will be developed in coordination with AEA and the licensing participants to meet the needs for developing the 2013-2014 Riparian Study Plan. Each memo will summarize progress, identify data gaps, and indicate coordination efforts with other studies.

**2013-2014 Study Plan(s)**. The 2013-2014 study plans will be developed through consultation during the Work Group Meetings through the formal FERC ILP study plan process. The AEA-selected environmental consultant will participate in the Work Group, as appropriate, and assist AEA, the Program Lead, and licensing participants develop the study plan outline, draft and final Proposed Study Plans and draft and final Revised Study Plans.

**Distribution maps in ArcGIS software**. Temporal and spatial distribution maps will be developed and delivered according to the schedule indicated below. Naming conventions of files and data fields and metadata descriptions must meet the ADNR standards established for the Susitna-Watana Hydroelectric Project.  All map and spatial data products will be delivered in the two-dimensional Alaska Albers Conical Equal Area projection, and North American Datum of 1983 (NAD 83) horizontal datum consistent with ADNR standards.

**Final 2012 Technical Memorandum**. A technical memorandum summarizing the 2012 results will be presented to resource agency personnel and other licensing participants, along with any spatial data products.

## SCHEDULE

The following schedule is for the 2012 scope of work. The schedule for the 2013-2014 components will be developed with the AEA-selected environmental consultant during the final 2013-2014 study planning process.

- Final 2012 Study Plan – March 20, 2012

- Final Draft 2013-2014 Study Plan Outline – March 20, 2012

- Draft 2013-2014 Proposed Study Plan – April 27, 2012

- Final 2013-2014 Proposed Study Plan – May 21, 2012

- Draft Technical Memorandum – June 29, 2012

- Draft 2013-2014 Revised Study Plan – August 15, 2012

- Final 2013-2014 Revised Study Plan – September 24, 2012

- Final Technical Memorandum – November 9, 2012

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SUSITNA-WATANA
HYDROELECTRIC PROJECT
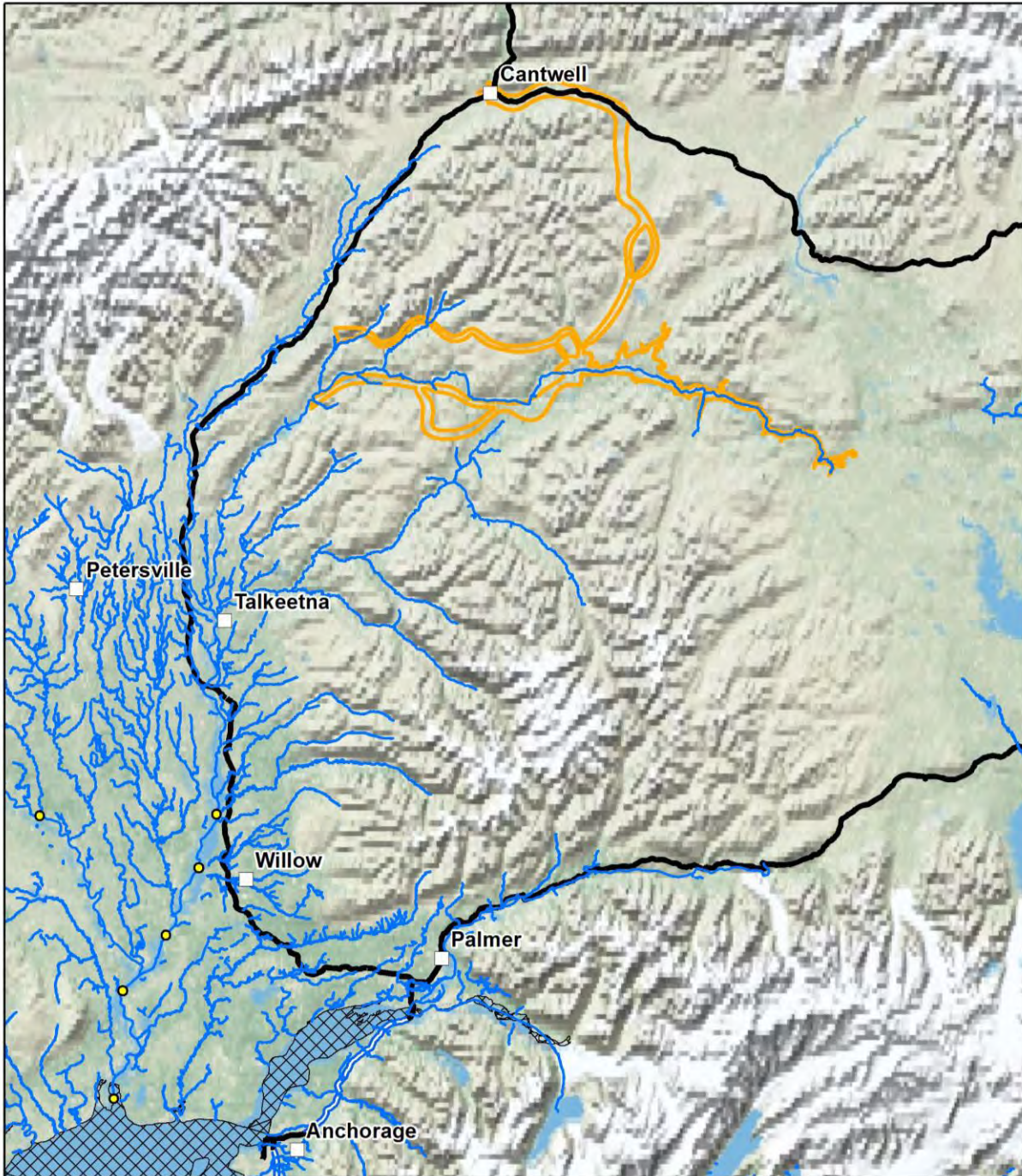
**Legend**

- ○ Eulachon Spawning
- — Anadromous Waters

**Beluga Critical Habitat**
- ⌗ Area 1
- ⁄ Area 2
- ▭ FERC Study Area

N

Scale Approximate

0    15    30    60

Miles

Date: Jan 2012

**Figure 1.**

**Anadromous Waters, Eulachon Spawning and Cook Inlet Beluga Whale Critical Habitat and Susitna-Watana Hydroelectric Project**