Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Cook Inlet Beluga Acoustic Monitoring in Lower Cook Inlet (LCI) Rivers (AK-20-01)
Administered by	Alaska Regional Office
BOEM Contact(s)	Sean Burril (sean.burril@boem.gov)
Procurement Type(s)	Interagency Agreement
Conducting Organization(s)	NOAA
Total BOEM Cost	$350,000
Performance Period	FY 2020–2023
Final Report Due	October 2023
Date Revised	October 18, 2023
Problem	Cook Inlet belugas (CIB) (*Delphinapterus leucas*) are an endangered and genetically distinct population in decline, with an estimated population size of only 328 whales in 2016. Although the reason for a lack of recovery is uncertain, one potential contributor is disturbance from anthropogenic noise, especially in critical foraging habitat such as river mouths.
Intervention	The year-round presence and habitat use of CIB in LCI near river mouths will be monitored for acoustically active whales, with a focus on quantifying feeding bouts. Changes in feeding activity or spatial displacement from feeding areas due to anthropogenic activities will be monitored.
Comparison	Study results will be evaluated in the context of recent and historical observations and assessments of CIB habitat use in LCI.
Outcome	Findings from this study would assist with formulating effective mitigation measures (e.g., temporal, spatial) for oil and gas exploration and development activities in or near CIB critical habitat, to help in the recovery of the endangered population.
Context	Cook Inlet Planning Area

BOEM Information Need(s): BOEM needs information about the summer and winter range of CIB and how the range might overlap with areas of potential oil and gas activities. A better understanding of beluga movements, location and timing of important feeding areas, and characterization of the acoustic environment year-round will support BOEM's Oil Spill Risk Analysis, National Environmental Policy Act analyses, Endangered Species Act (ESA) Section 7 consultations, and development of mitigation measures related to future lease sales in Cook Inlet, as well as potential exploration and development on existing leases.

Background: The Distinct Population Segment of Cook Inlet beluga whales (CIB), which remains within Cook Inlet year-round, was listed as endangered under the ESA in 2008 following a major decline in abundance (~50%) in the 1990s associated with overhunting. Although hunting ended in 2000, those

effects may have left the CIB population to continue to decrease, in addition to factors other than hunting currently impede recovery. The latest population estimate from 2018 indicates there are 279 animals down from an estimated 1300 in the 1980s and a decline of 2.3% over the last decade (Sheldon and Wade 2019). The summer range of CIBs now occurs mostly in the Upper Cook Inlet (UCI), north of Kalgin Island, however prior to 1980, belugas ranged south of Kalgin Island and into Kachemak Bay. Their winter range was largely unknown until recent research efforts. Limited satellite telemetry data from 1999-2003 showed use of deeper water habitats farther from shore in the mid and Lower Cook Inlet (LCI) (Hobbs et al. 2005). Research efforts in 2018 and 2019 (BOEM/ NMFS) funded aerial surveys, NMFS supported citizen science efforts, (NMFS/Alaska Sea Grant study), and extensive passive acoustic monitoring efforts (2008 - current, Castellote et al. 2020) have demonstrated the presence of CIB in LCI, including along the coastline and in the rivers, as well as near or within the OCS. Four belugas were also observed in Kachemak Bay for the first time in several years in July 2018 and there is preliminary evidence to suggest CIB may have been in the mouth of Port Graham in September 2019.

Historical accounts from Native hunters and local residents indicate that belugas have used river mouths such as the Kenai and Kasilof Rivers for year round feeding but little contemporary work has focused on these LCI rivers which are exposed to a high level of human activity from commercial and sport fishing to development-related activities from industry such as oil and gas.

Beluga whales are highly dependent on sound to communicate, navigate, and find prey. Understanding CIB use of LCI rivers and natural ambient noise levels will allow for characterizing the baseline conditions required to evaluate how much of a disturbance is caused by noise from anthropogenic sources and provide insight about whether noise is an impact factor in beluga habitat use.

Objectives:

- Acoustically determine the seasonal foraging occurrence of CIB in four LCI rivers.
- Characterize the type and level of noise from anthropogenic activities that have the potential to disturb CIB in LCI rivers and quantify the temporal overlap with CIB.
- Develop a range evaluation of anthropogenic noise presence, and potential CIB feeding periods in the monitored LCI rivers.
- Assess correlations of CIB occurrence with currents, tides, and physical characteristics.
- Summarize acoustics recorded for other marine mammals.

Methods: Acoustic cetacean and porpoise detectors (F-PODs) will be deployed to monitor beluga presence and foraging at Tuxedni and Chinitna rivers (western Cook Inlet) and the Kenai and Kasilof rivers (eastern Cook Inlet). F-PODs “listen” continuously for over 200 days and can detect beluga echolocation up to 900 m away. CIB presence will be identified by detection of echolocation signals and results will be analyzed to build seasonal presence plots. Foraging will be identified by the unique echolocation signature emitted by odontocetes when chasing prey (click trains ending in buzzes). The Kenai River would be monitored year-round while NMFS will monitor UCI locations only during the open water season.

This project will also leverage NMFS’s citizen science efforts to incorporate visual observations to provide a quantified measure of the level and type of anthropogenic activities in and around the river sections monitored acoustically. NMFS will also collaborate with the Beluga Whale Alliance and Alaska Wildlife Alliance to collect additional visual observation data at the several acoustically monitored river

locations. Helicopters or small planes may be needed to deploy F-PODs in difficult to access locations. This study can build upon previous experience acoustically monitoring river mouths in Cook Inlet (e.g., Eagle River, Chickaloon River, and Little Susitna River).

Specific Research Question(s):

1. What rivers are used by CIB to feed and when?
2. Do CIB change behavior in the presence of anthropogenic activities and if so, is it due to certain levels or types of anthropogenic activities?
3. How do the acoustic data and visual data compare?

Current Status: Awaiting final report

Publications Completed: None

Affiliated WWW Sites: http://www.boem.gov/akstudies/