

**Report #1: Photo-Identification of Beluga Whales in Cook Inlet, Alaska:**

**Spatial and temporal patterns of habitat use by groups and individuals in 2023, with emphasis on feeding and reproduction**

**Prepared by:**

The Cook Inlet Beluga Whale Photo-ID Project  
Anchorage, Alaska, USA  
[tamaracookinletbeluga@gmail.com](mailto:tamaracookinletbeluga@gmail.com)



**Contract Number:** 1305M321CNFFS0040-P22001-Mod1

**Contract Title:** Cook Inlet Beluga Whale Photo-Identification Studies  
(2023 field season/cataloging)

**Principal Investigator:** Tamara McGuire

**Co-Investigator:** John McClung

**Project Period:**

**Draft Report Submission Date:** July 17, 2024

**Final Report Submission Date:** September 27, 2024

**Prepared for:** National Marine Fisheries Service, Alaska Region

**Citation:**

**McGuire, T. L. and J. R. McClung. 2024.** Report #1: Photo-Identification of Beluga Whales in Cook Inlet, Alaska: Spatial and temporal patterns of habitat use by groups and individuals in 2023, with emphasis on feeding and reproduction. Report prepared by the Cook Inlet Beluga Whale Photo-ID Project for National Marine Fisheries Service, Alaska Region. 5 pp.

*2023 field team: Debbie Boyle, Kyoko Hada, John McClung, Brian McGurgan, Chandera Tolley, Amy Willoughby, and Gina Himes Boor. Thanks to JBER, ADF&G, NMFS AKR and MML, UW, and the public for sharing sightings and photos.*

## Background

The Cook Inlet Beluga Whale (CIBW) Photo-Identification (ID) Project was contracted by National Marine Fisheries Service (NMFS) to use non-invasive photo-ID techniques to help fill data gaps regarding individual and population characteristics of this endangered beluga population, with the goal of providing information to aid NMFS in conservation and management actions. The contract specified that the CIBW Photo-ID Project would conduct a minimum of 25 photo-ID surveys in 2023, identify individual whales from photographs, and summarize results in a series of six reports. This report, the first in the series, is entitled, *Spatial and temporal patterns of habitat use by groups and individuals in 2023, with emphasis on feeding and reproduction*. Detailed background information and methods for this long-term project are included in previous annual reports, available at [www.cookinletbelugas.com](http://www.cookinletbelugas.com).

## Results

### Feeding Behavior

Any feeding behavior of belugas observed during surveys was noted as *feeding suspected* (i.e., chasing prey as evidenced by bursts of speed, lunges, and/or focused diving in a specific location, or by fish jumping out of the water near belugas), or *feeding confirmed* (i.e., beluga was seen with a prey item in its mouth), *no feeding behavior observed*, or *unknown*. Feeding behavior (suspected and confirmed) during the 2023 field season was observed March through May, and again August through October (Table 1). Feeding behavior was observed in all the survey areas in which beluga groups were encountered (Table 1, Figure 1a), consistent with patterns from previous years of the study (Figure 1b) although information from July is unavailable for 2023.

Table 1. CIBW Photo-ID Project observations of feeding behavior by survey area and month. x = no effort, yes = feeding confirmed or suspected, no = no feeding behavior observed, unk = unknown, 0 = no belugas. Surveys were conducted March through October 2023, although not in June.

Survey Area	March	April	May	June	July	August	September	October
Susitna River Delta	x	x	yes	x	unk	yes	x	x
Knik Arm	x	x	x	x	x	yes	yes	yes
Turnagain Arm	0	0	0	x	x	yes	yes	yes
Kenai River Delta	yes	yes	no	x	x	yes	yes	yes
Chickaloon Bay/Fire Island	x	x	x	x	x	yes	x	x

### Groups with Calves

Observers noted if calves were present in groups. Calves were usually dark gray, <3/4 the total length of adult belugas, and swimming within one body length of an adult-sized beluga. In the 2023 field season, calves were seen March through May, and again August through October (Table 2). Groups with calves occurred in the same general locations as groups without calves, both in 2023 and for all 2005–2023 surveys combined (Figure 2) although information from July is unavailable for 2023.

Table 2. CIBW Photo-ID Project observations of beluga calves by survey area and month. x = no effort, yes = calves observed, no = no calves observed, unk = unknown, 0 = no belugas. Surveys were conducted March through October 2023, although not in June.

Survey Area	March	April	May	June	July	August	September	October
Susitna River Delta	x	x	yes	x	unk	yes	x	x
Knik Arm	x	x	x	x	x	yes	yes	yes
Turnagain Arm	0	0	0	x	x	yes	yes	yes
Kenai River Delta	yes	yes	unk (too far)	x	x	yes	yes	yes
Chickaloon Bay/Fire Island	x	x	x	x	x	yes	x	x

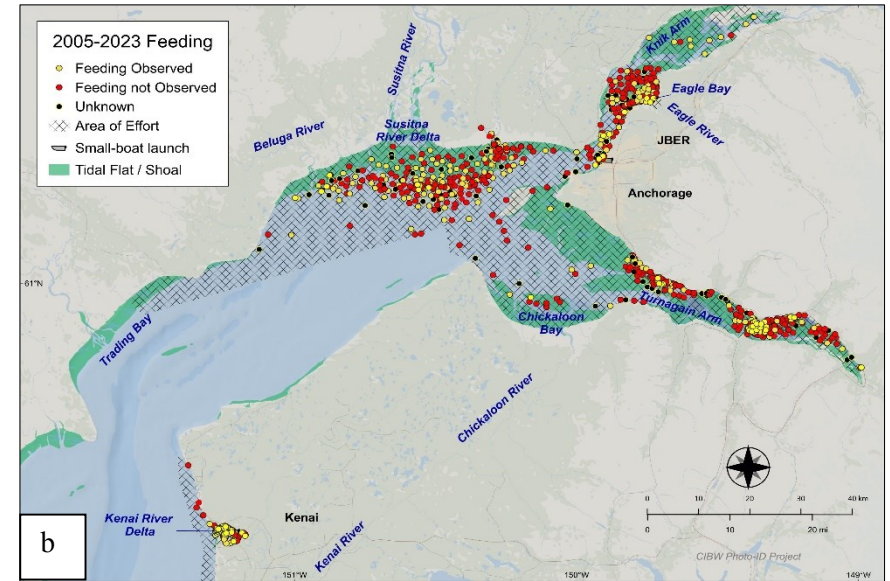
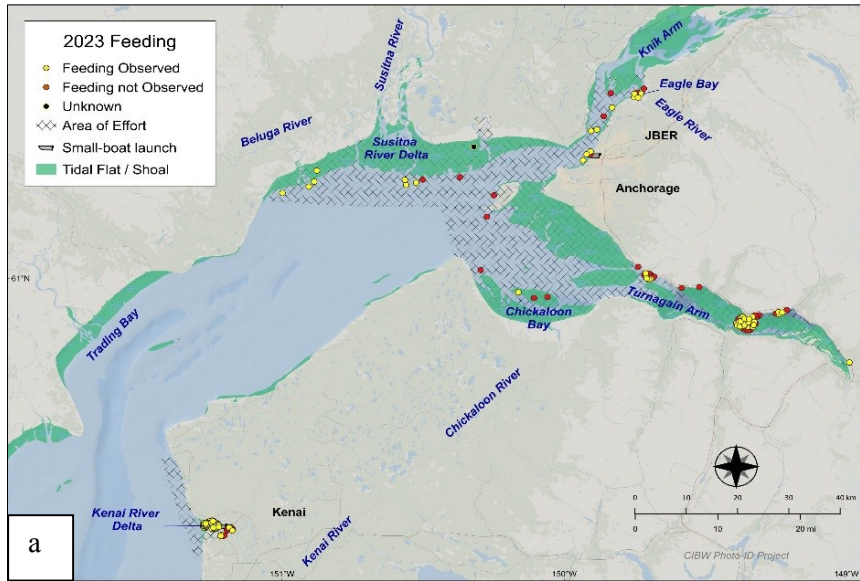


Figure 1. Location of beluga groups with and without observations of feeding behavior (suspected or confirmed) during photo-ID surveys conducted in 2023 (a) and 2005–2023 combined (b).

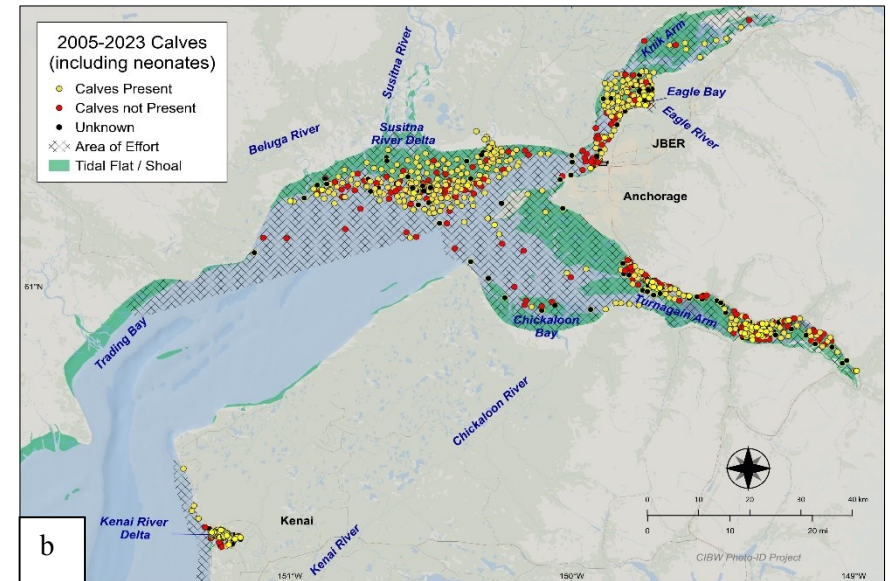
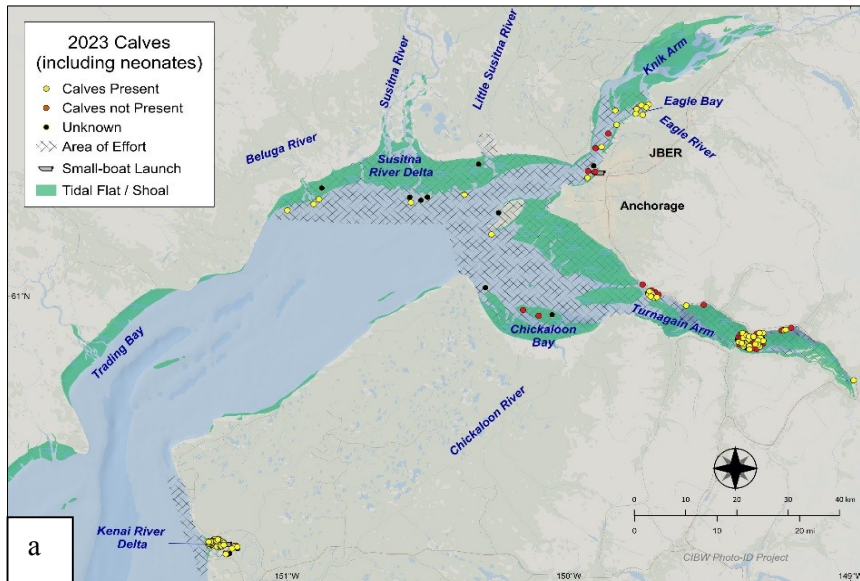


Figure 2. Location of beluga groups with and without calves and/or neonates encountered during photo-ID surveys conducted in (a) 2023 and from (b) 2005–2023.



## Groups with Neonates

Observers noted if any calves were neonates (i.e., newborns, estimated to be hours to weeks old) based on extremely small size (1.5 m [5 ft]), a wrinkled appearance because of the presence of fetal folds, and uncoordinated swimming and surfacing patterns. In 2023, neonates were photographed August through October (Table 3). The first neonates were first seen in early August (August 2 in the Susitna River Delta and August 4 in Knik Arm) and last seen in mid-October (October 12 in Turnagain Arm). Groups with neonates occurred in the same general locations as groups without neonates, both in 2023 and for all 2008–2023 surveys combined (Figure 3), although information from July is unavailable for 2023.

Table 3. CIBW Photo-ID Project observations of neonates by survey area and month. x = no effort, yes = neonates observed, no = neonates not observed, unk = unknown, 0=no belugas. Surveys were conducted March through October 2023, although not in June.

Survey Area	March	April	May	June	July	August	September	October
Susitna River Delta	x	x	no	x	unk	yes	x	x
Knik Arm	x	x	x	x	x	yes	no	no
Turnagain Arm	0	0	0	x	x	unk	yes	yes
Kenai River Delta	unk	unk	unk	x	x	unk	yes	unk
Chickaloon Bay/Fire Island	x	x	x	x	x	unk	x	x

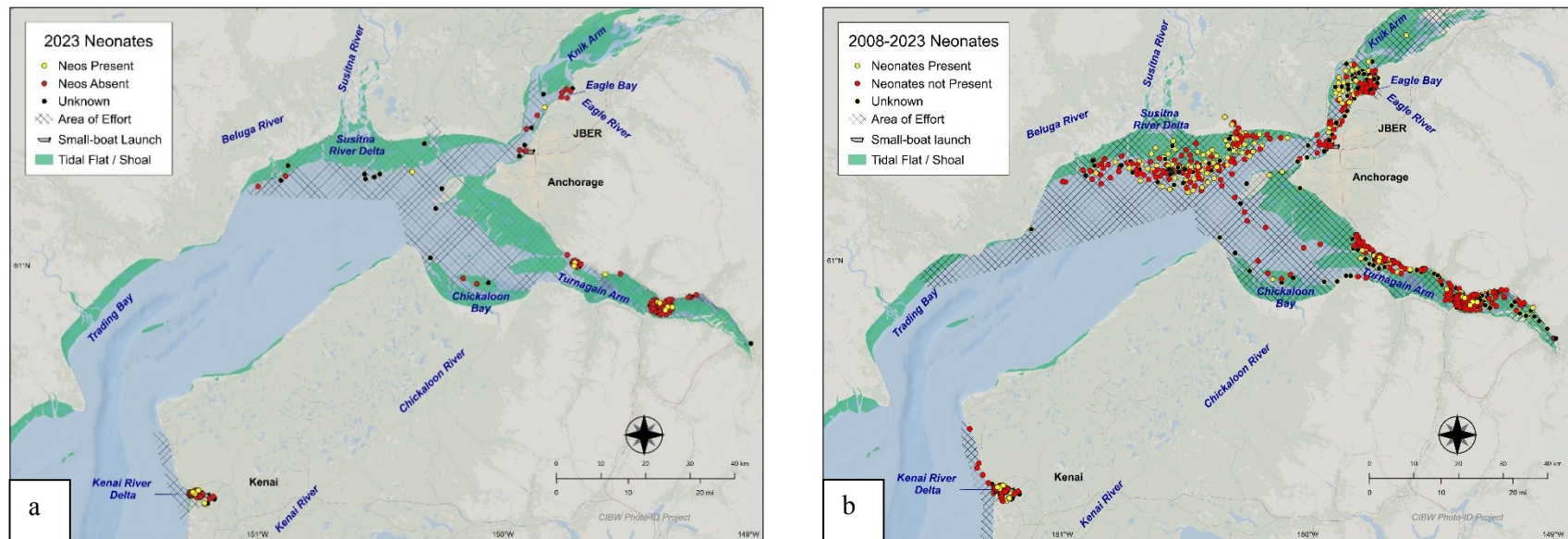


Figure 3. Location of beluga groups with and without neonates encountered during photo-ID surveys in 2023 (a) and 2005–2023 combined (b).

## Habitat Use by Individuals

Individual Cook Inlet belugas have not been seen to display site fidelity; instead, they move among all the areas of Cook Inlet. Belugas may return to an area season after season or remain in an area several days in a row, but they still move throughout the survey area. The following belugas have been photographically followed over several years and exemplify the general habitat use patterns that we are observing.



Figure 4. Photograph of beluga D111's left side.



Figure 5. Photograph of beluga D107's right side.

- Female D111 was captured and tagged by NMFS in 2000 and her records span 23 years. Her tagging records from 2000 and her early photo-ID records (2005–2017) show her using Knik Arm and the Susitna River Delta, but not Turnagain Arm. Then, in 2018, she was photographed in the Susitna River Delta, Chickaloon Bay, and Turnagain Arm. In 2019, she was photographed in the Susitna River Delta, Knik Arm, and Chickaloon Bay, but not in Turnagain Arm. In 2020, she was photographed in the Susitna River Delta and in Turnagain Arm, and in 2021 she was photographed only in Turnagain Arm. In 2022, she was photographed in Knik Arm in late August, then in Turnagain Arm in early- and mid-September. In 2023, she was photographed in the Susitna River Delta in August, and Turnagain Arm in September.
- Beluga D107's sighting records span 18 years (2005–2022) and all survey areas, including Kenai in recent years (Table 4). Beluga D107 was often by itself but has also been photographed in groups of various sizes. Beluga D107 was not photographed in 2023, despite a concerted effort by researchers and citizen scientists to observe, report on, and photograph it; it is one of the few identified belugas whose marks can be observed in the field (i.e., without zooming in on a digital image).

Table 4. Years and locations in which beluga D107 was photographed.

Year	Location	Year	Location	Year	Location
2005	Knik Arm	2011	Susitna River Delta	2017	Susitna River Delta
2006	Susitna River Delta	2012	Susitna River Delta	2018	Susitna River Delta
2007	Knik Arm	2013	Susitna River Delta	2019	Kenai River Delta and Knik Arm
2008	Knik Arm and Turnagain Arm	2014	Susitna River Delta	2020	Knik Arm
2009	Knik Arm and Susitna River Delta	2015	Susitna River Delta	2021	Kenai River Delta and Turnagain Arm
2010	Susitna River Delta	2016	Susitna River Delta and Knik Arm	2022	Kenai River Delta and Turnagain Arm