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

Spatial and temporal patterns of habitat use by groups and individuals in 2024, with emphasis on feeding and reproduction

Prepared by:

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Background

The Cook Inlet Beluga Whale (CIBW) Photo-Identification (ID) Project was contracted by the 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 2024, 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 2024, 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.

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 f*eeding 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 March through December 2024 field season was not observed in March, but was observed April through May, and again July through December (surveys were not conducted in June due to logistical constraints beyond our control; 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). Surveys of Chickaloon Bay were not conducted in 2024 due to unfavorable weather conditions in this area during survey days.

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 December 2024, although not in June.

Survey Area	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Susitna River Delta	x	x	x	x	yes	yes	x	x	x	x
Knik Arm	x	x	x	x	x	no	yes	no	x	x
Turnagain Arm	0	yes	0	x	x	yes	yes	yes	x	x
Kenai River Delta	no	yes	yes	x	x	yes	yes	yes	yes	yes

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 2024 field season, calves were seen March through May, and again July through December (surveys were not conducted in June; Table 2). Groups with calves occurred in the same general locations as groups without calves, both in 2024 and for all 2005–2024 surveys combined (Figure 2). Surveys of Chickaloon Bay were not conducted in 2024.

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 December 2024, although not in June.

Survey Area	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Susitna River Delta	x	x	x	x	yes	yes	x	x	x	x
Knik Arm	x	x	x	x	x	yes	yes	no	x	x
Turnagain Arm	0	yes	0	x	x	yes	yes	yes	x	x
Kenai River Delta	yes	yes	yes	x	x	yes	yes	yes	yes	yes

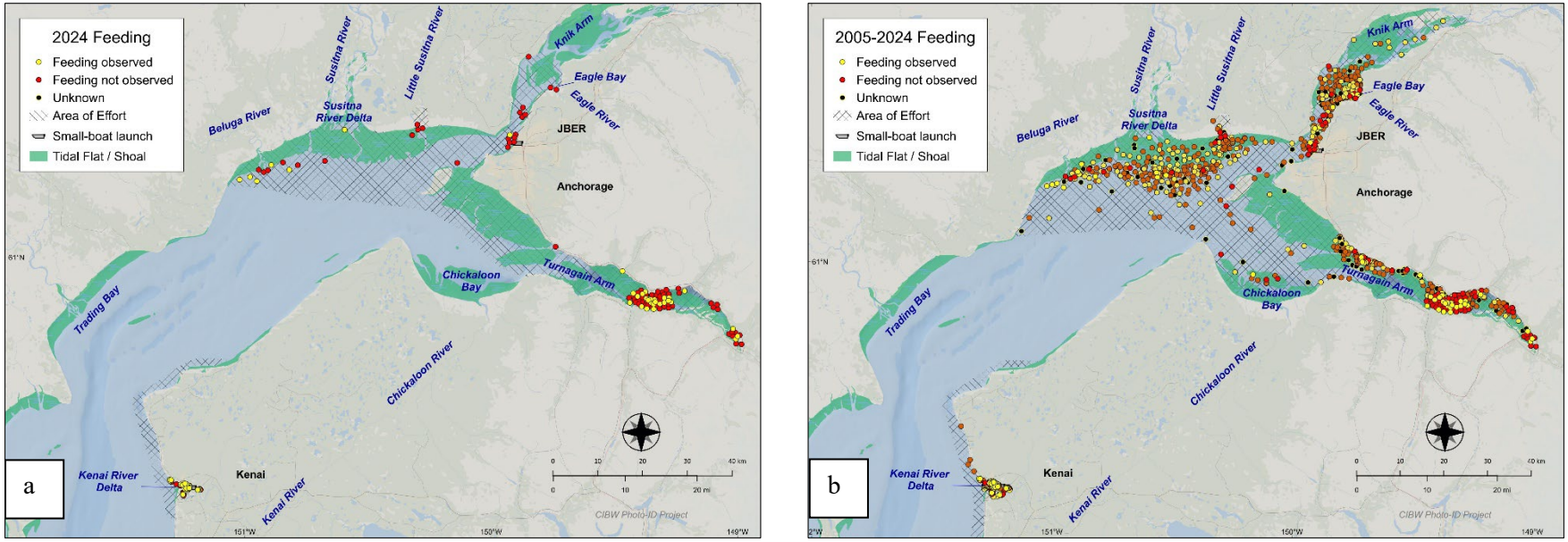

Figure 1. Location of beluga groups with and without observations of feeding behavior (suspected or confirmed) during photo-ID surveys conducted in 2024 (a) and 2005–2024 combined (b). Surveys of Chickaloon Bay were not conducted in 2024.

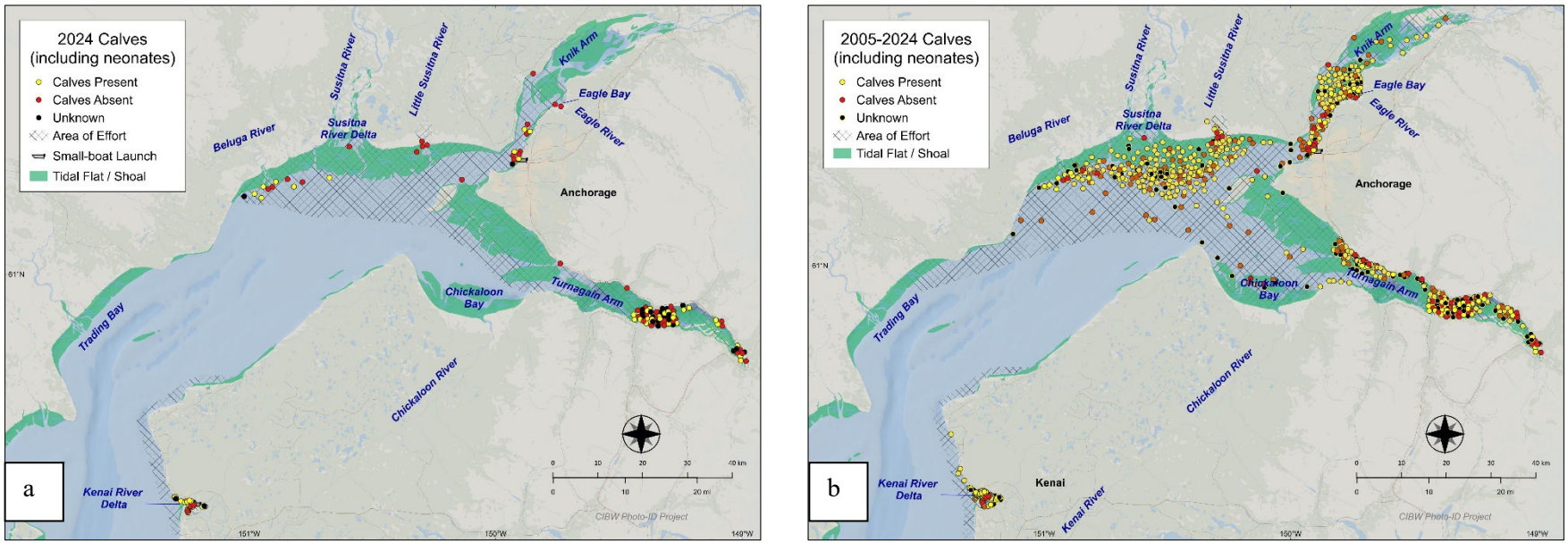

Figure 2. Location of beluga groups with and without calves and/or neonates encountered during photo-ID surveys conducted in (a) 2024 and from (b) 2005–2024. Surveys of Chickaloon Bay were not conducted in 2024.

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 2024, neonates were photographed in August, October, and November (Table 3). Neonates were first seen August 11 in Turnagain Arm and last seen November 8 in the Kenai River. Groups with neonates occurred in Turnagain Arm and the Kenai River Delta. In many months and locations of the 2024 field season, neonate presence during surveys was unknown because the small, scattered groups and rougher waters made them difficult to detect and photograph. Locations of groups with neonates in 2024 and for all 2008–2024 surveys combined are presented in Figure 3. Surveys of Chickaloon Bay were not conducted in 2024.

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 December 2024, although not in June.

Survey Area	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Susitna River Delta	x	x	x	x	unk	unk	x	x	x	x
Knik Arm	x	x	x	x	x	unk	unk	no	x	x
Turnagain Arm	0	no	0	x	x	yes	unk	unk	x	x
Kenai River Delta	unk	unk	unk	x	x	unk	unk	yes	yes	unk

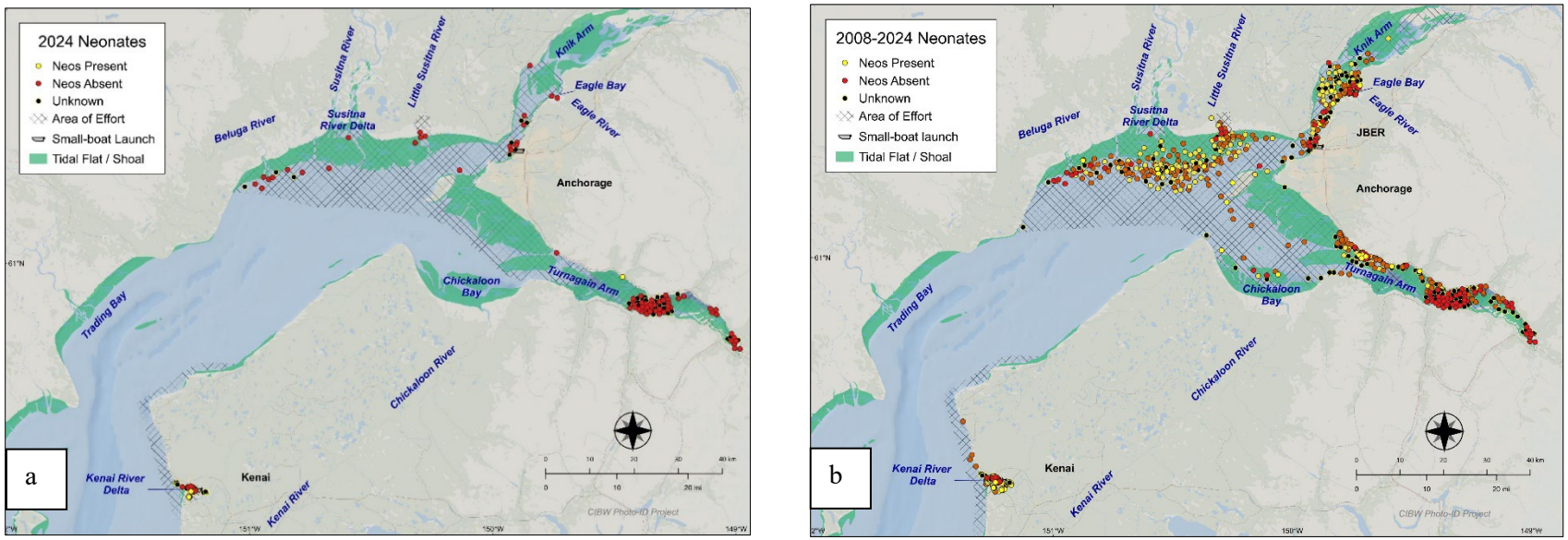

Figure 3. Location of beluga groups with and without neonates encountered during photo-ID surveys in 2024 (a) and 2005–2024 combined (b). Surveys of Chickaloon Bay were not conducted in 2024.

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 beluga, L44241, has been photographically followed between 2021and2024 and exemplifies the general habitat use patterns that we are observing. This beluga has been classified as a female, based on close accompaniment by calves in 2021, 2023, and 2024. She usually appears thin in photographs taken in March through May, and robust in photos taken in August and September.

Figure 4. Photograph of beluga L44241's left side, with a calf in Turnagain Arm, August 30, 2024.

Table 4. Dates and locations in which beluga L44241 was photographed.

Date Photographed	Location
2021	
2021-Sep-01	Turnagain Arm
2023	
2023-Mar-30	Kenai River
2023-Aug-30	Turnagain Arm
2023-Sep-05	Turnagain Arm
2023-Sep-11	Turnagain Arm
2023-Sep-24	Turnagain Arm
2024	
2024-Apr-01	Kenai River
2024-Apr-20,25,26,28,30	Kenai River
2024-May-01	Kenai River
2024-Sep-18	Turnagain Arm
2024-Sep-27	Turnagain Arm