Report #6: Photo-Identification of Beluga Whales in Cook Inlet, Alaska:

Summary of annual survey effort and group size, location, and age-class composition in 2024

Prepared by:

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Contract Number: 1305M321CNFFS0040-P22001-Mod2

Contract Title: Cook Inlet Beluga Whale Photo-Identification Studies (2024 field season/cataloging)

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Project Period:

Draft Report Submission Date: July 30, 2025

Final Report Submission Date: September 17, 2025

Prepared for: National Marine Fisheries Service, Alaska Region

Citation:

McGuire, T. L. and J. R. McClung. 2025. Report #6: Photo-Identification of Beluga Whales in Cook Inlet, Alaska: Summary of annual survey effort and group size, location, and age-class composition in 2024. Report prepared by the Cook Inlet Beluga Whale Photo-ID Project for National Marine Fisheries Service, Alaska Region. 6pp.

2024 field team: Debbie Boyle, Mackenzie Garner, Kyoko Hada, John McClung, Brian McGurgan, Chandera Tolley, Tamara McGuire and Samantha Murk. Thanks to JBER, ADF&G, NMFS AKR and MML, UW, AKBMP, and the public for sharing sightings and photos. Surveys conducted under NMFS permit #27128.

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 sixth in the series, is entitled *Summary of annual survey effort and group information (e.g., size, location, and group composition) in 2024.* Detailed background information and methods for this long-term project are included in previous annual reports, available at www.cookinletbelugas.com.

Results

Annual Survey Effort

The 2024 field season was the 20th consecutive field season for the CIBW Photo-ID Project. Between March 8 and December 31, field photographers conducted or participated in 240 vessel- and land-based surveys in Cook Inlet, Alaska. (Table 1, Table 2, Figure 1), bringing the project total to 1,024 photo-ID surveys since 2005. The Cook Inlet study area is divided into five survey sub-areas: Susitna River Delta, Knik Arm, Turnagain Arm, Chickaloon Bay/Fire Island, and Kenai River Delta. A Kenai-based field photographer was added in 2022, which increased effort and the number of groups encountered in this sub-area (Table 1, Table 2). Funding from the Knik Tribe in late 2024 allowed sampling in November and December in Kenai, instead of the previous field season that ended Oct. 31. Surveys of Chickaloon Bay/Fire Island were not conducted in 2024.

Table 1. Annual number of CIBW Photo-ID Project surveys conducted in Cook Inlet, Alaska, from 2005 through 2024 according to survey sub-area.

	Year																				
Sub-Area	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**	**2022**	**2023**	**2024**	**Total**
Susitna River Delta	16	17	5	8	13	14	11	13	8	9	10	11	9	11	12	9	11	9	8	6	210
Knik Arm	32	13	5	9	10	9	16	12	3	7	4	8	1	5	4	4	19	13	12	12	198
Turnagain Arm	0	4	5	12	12	15	16	15	12	8	8	7	3	9	12	24	26	24	65	70	347
Chickaloon Bay/ Fire Island	4	1	1	2	1	0	2	5	2	2	1	0	0	1	1	0	1	0	2	0	26
Kenai River Delta	0	0	0	0	0	0	4	14	6	0	0	0	3	6	3	3	9	150	133	152	483
Annual Number of Surveys	52	35	16	31	36	38	49	59	31	26	23	26	16	32	32	40	66	196	220	240	1,264

Table 2. Photo-ID survey effort and beluga whale groups encountered in Cook Inlet, Alaska in 2024. *The mouth of Ship Creek, Knik Arm, was surveyed for two hours on March 29, 2024 without belugas, and effort is included in Figure 3a.

	2024			
	Susitna River Delta	Knik Arm*	Turnagain Arm	Kenai River Delta
Range of Survey Dates	July 19-Aug 22	Aug-4 to Oct-11	March-18 to April 28 & Aug-10 to Oct-27	Mar-22 to May-5 & Aug-24 to Dec-31
Number of Surveys	6	12	70	152
Number of Groups Encountered	17	14	71	105
Number of Beluga Sightings	167	69	495	1,453
Mean Number of Groups per Survey	2.8	1.2	1.0	0.69
Mean Number of Belugas per Survey	27.8	5.7	7.1	9.6
Mean Group Size	9.8	4.9	7.0	13.8
Maximum Group Size	30	16	27	50
Group Size Range	1-30	1-16	1-27	1-50

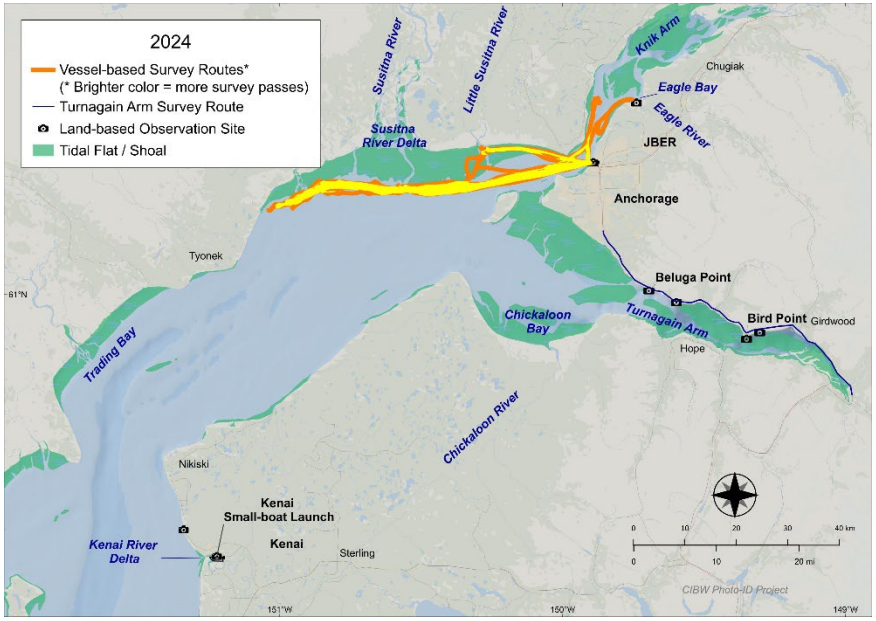


Figure 1. Vessel routes (from daily GPS track lines) with land-based stations and survey routes for all photo-ID surveys conducted in 2024. The level of effort of the vessel-based surveys is indicated by the intensity of the colors of the track lines. See Table 1 for the exact number of surveys.

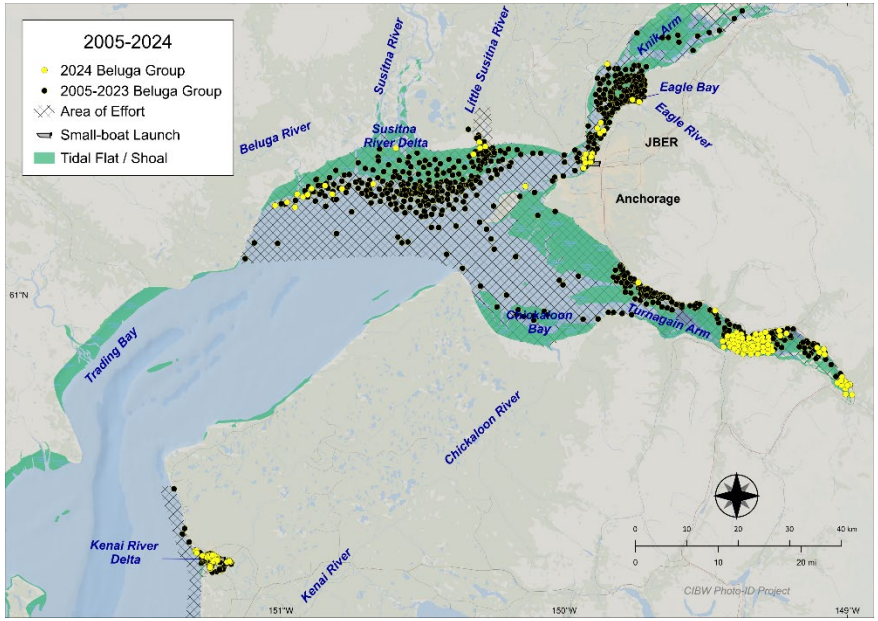


Figure 2. Beluga whale groups encountered during all photo-ID surveys conducted in 2005–2024 combined.

Group Size and Location

There were 207 groups encountered during photo-ID surveys in 2024 (Table 2; Figure 2). The mean number of belugas per survey (Table 2) in 2024 was greatest in the Susitna River Delta, and smallest in Knik Arm. Mean group size was greatest in the Kenai River. Maximum group size observed in 2024 was lower than it had been in all of the previous years of the study, except for 2022 (Table 3). The largest group observed in 2024 was in the Kenai River, unlike the previous years of the study where the largest groups of the year generally had been encountered in the Susitna River Delta (Table 3). The largest group encountered in 2024 also occurred approximately two months later than had been observed in previous years.

Table 3. Summary of date and location of the maximum annual group size for each field season of beluga photo-ID surveys in Cook Inlet, Alaska during the 2005–2024 study period.

Year	Field Season	Location of Largest Observed Group of Year	Date of Largest Group of Year	Maximum Group Size Observed
2005	Apr 14 – Oct 21	Susitna River Delta	Jul 23	152
2006	May 12 – Oct 5	Susitna River Delta	Jul 26	61
2007	Jun 28 – Oct 27	Susitna River Delta	Jul 27	74
2008	May 21 – Oct 31	Susitna River Delta	Jul 29	121
2009	Jun 19 – Oct 28	Susitna River Delta	Aug 3	152
2010	May 9 – Oct 31	Susitna River Delta	Jul 16	173
2011	Apr 16 – Oct 31	Susitna River Delta	Jul 27	136
2012	May 2 – Oct 31	Susitna River Delta	Jul 20	200
2013	Apr 20 – Oct 31	Susitna River Delta Chickaloon Bay	Jul 22 & Jul 31 Sep 16	200
2014	Jul 8 – Oct 31	Susitna River Delta	Jul 27	250
2015	May 28 – Oct 22	Susitna River Delta	Jul 20	313
2016	May 24 – Sep 30	Susitna River Delta	Jul 19	148
2017	Jul 21 – Sep 26	Susitna River Delta	Jul 27 & Aug 5	300 & 302
2018	May 2 – Oct 25	Susitna River Delta	Jul 12	222
2019	May 18 – Oct 31	Susitna River Delta	Jun 3	200
2020	Apr 9 – Nov 9	Susitna River Delta	Jul 23	200
2021	Apr 9 – Oct 31	Susitna River Delta	Jun 5	125
2022	Mar 12 – Oct 31	Susitna River Delta	Jul 27	50
2023	Mar 7 – Oct 31	Knik Arm	August 11	118
2024	Mar 8-Dec 31	Kenai River	Sep 27	50

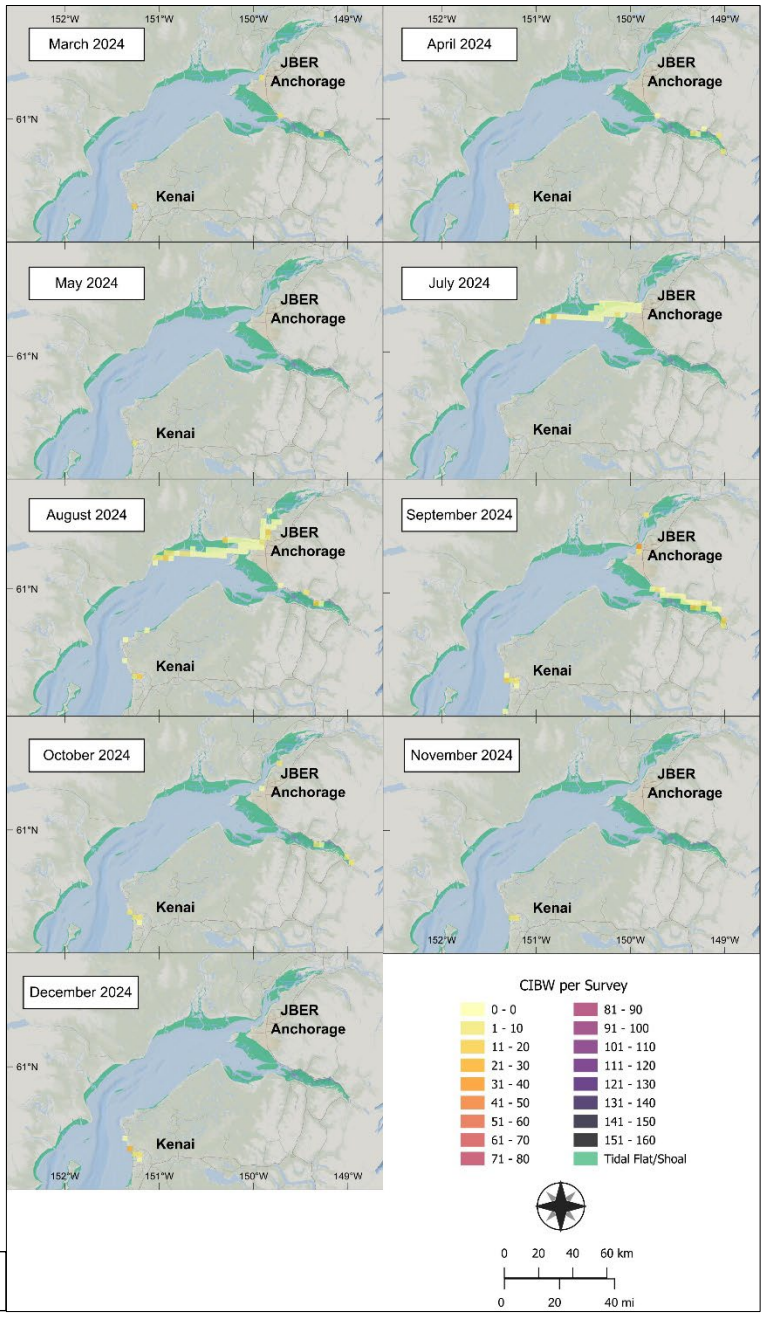
Group Composition

Group composition data collected during surveys included the number of whales in each body-color category (white or gray) and age class (calves and neonates). Because belugas are born dark gray and lighten as they age, skin color can be used as an indicator of relative age. Groups whose composition could not be determined (usually because of distance from observer and/or rough water or glare) are not included in this summary. Group composition varied somewhat by survey sub-area. Almost all groups encountered contained white belugas. More groups were observed to contain gray belugas in the Susitna and Kenai River deltas than in either Knik or Turnagain Arm (Table 4). More groups were observed to contain calves and neonates in the Kenai River than those seen in other locations, although the relatively narrow and protected waters of this subarea may have made smaller individuals easier to detect on days when poor weather affected sighting conditions. More information on calves and neonates encountered in 2024 are presented in reports #1 and #3.

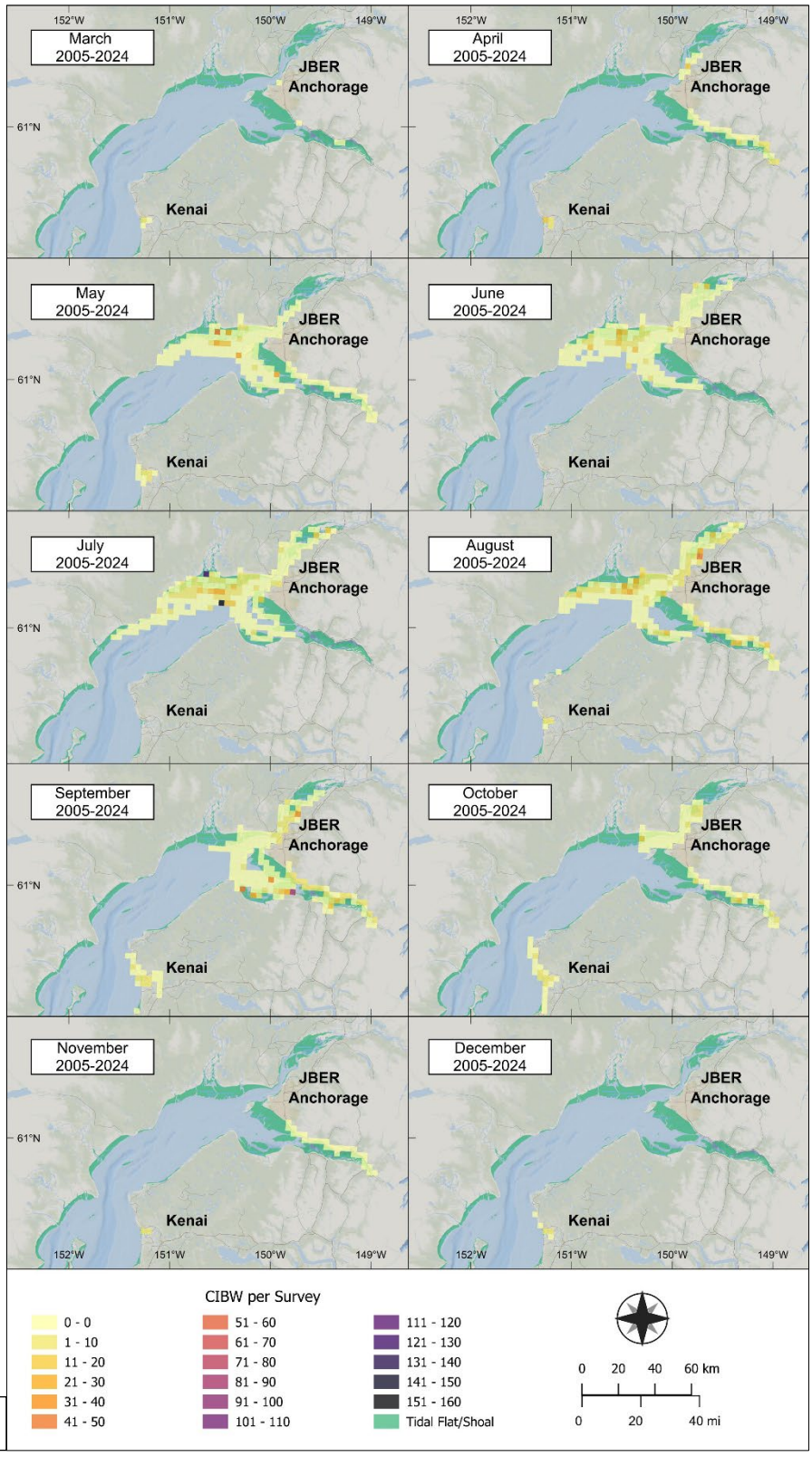
Table 4. Percent color/age-class composition of beluga groups sighted during surveys of Cook Inlet, Alaska in 2024 (excluding those groups for which a color/age-class could not be determined).

2024	% of groups containing:			
Sub-Area	**White-Colored Whales**	**Gray-Colored Whales**	**Calves**	**Neonates**
Susitna River Delta	94	94	35	0
Knik Arm	93	69	33	0
Turnagain Arm	94	63	51	2
Kenai River Delta	99	93	88	6

Figure 3. Average counts of belugas per survey by month for surveys conducted in 2024 (a) and in 2005–2024 combined (b). Values were obtained by partitioning the study area into grid cells 3 km by 3 km and calculating the average number of belugas detected per survey for each cell. JBER denotes Joint Base Elmendorf Richardson in Knik Arm. Surveys were not conducted in June.



a


March
2005-2024
April
2005-2024
May
2005-2024
June
2005-2024
July
2005-2024
August
2005-2024
September
2005-2024
October
2005-2024
November
2005-2024
December
2005-2024
JBER
Anchorage
Kenai
152°W
151°W
150°W
149°W
61°N
CIBW per Survey
0 - 0
1 - 10
11 - 20
21 - 30
31 - 40
41 - 50
51 - 60
61 - 70
71 - 80
81 - 90
91 - 100
101 - 110
111 - 120
121 - 130
131 - 140
141 - 150
151 - 160
Tidal Flat/Shoal
0 20 40 60 km
0 20 40 mi

b