

**Report #4: Photo-Identification of Beluga Whales in Cook Inlet, Alaska:**

**Summary of post-research monitoring of biopsies and satellite-tagged whales: sighting histories and photographs of wound healing in 2023**

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*2023 photo-processing team: John McClung, Amy Willoughby, Chandera Tolley, Mackenzie Garner, Samantha Murk, and Tamara McGuire. Photographs taken in 2023 under NMFS permit 2222.*

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## 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 fourth in the series, is entitled, *Summary of post-research monitoring of biopsies and satellite-tagged whales: sighting histories and photographs of wound healing in 2023*. Details of the long-term Photo-ID Project background and methods can be found in previous project reports, available at [www.cookinletbelugas.com](http://www.cookinletbelugas.com).

## Results

### 2023 Resightings of belugas tagged 1999–2002

During a NMFS-led CIBW satellite tagging study conducted between 1999 and 2002, a total of 20 CIBWs were captured and 18 of those were tagged. Details about the capture and tagging and whale movements during the life of the tags are presented in Sheldon et al. (2018). Five (25%) of the 20 CIBWs originally captured and/or tagged between 1999 and 2002 were photographed in 2023: four individuals are classified as *confirmed satellite-tagged* (scars having a distinct shape, an obvious pattern, and/or scars found in known tagging locations on the body) and one individual is classified as *possible satellite-tagged* (scars that were similar to confirmed tagging scars but were less distinct in shape, pattern, or placement) (Table 1; Figure 1).



Figure 1. Photographs of the five belugas documented in 2023 who are confirmed or possible satellite-tagged whales from the tagging study conducted by NMFS from 1999 to 2002. a) beluga D49 – left side, confirmed satellite-tag scar; b) D111 – left side, confirmed satellite-tag scar; c) D403 – left side, confirmed satellite-tag scar; d) D243 – left side, confirmed satellite tag scar; e) D75 – left side, possible satellite-tag scar.

Table 1. Sighting records of satellite-tagged (confirmed and possible) individuals in the 2005–2023 CIBW Photo-ID Catalog and photographed in 2023, including records of reproduction, survival, and satellite-tag scar status. A beluga was classified as “presumed female” if it appeared in the same uncropped image with a calf alongside, and as “confirmed female” based on results from DNA samples collected at the time of capture. “U”=unknown.

Photo-ID # (NMFS tagging ID #)	Research Scar (Year)	First Identified in Catalog	Scar First Photographed	Sex	Photographed with a Calf Born Post Tagging (2005-2022)	Research Scar Sighting History (see Figure 1 for most-recent photos)
D49 (U)	Confirmed satellite tag (U)	2005	2005	Presumed female	Yes	Tag scars conspicuous with possible infection intermittently throughout sighting history including dark coloration in 2021-2023.
D111 (CI-00-02)	Confirmed satellite tag (2000)	2005	2000	Female <sup>1</sup>	Yes	Tag scars inconspicuous and no signs of infection; abrasions across dorsal ridge; appears healthy overall.
D243 (CI-01-01)	Confirmed satellite tag (2001)	2005	2001	Female <sup>1</sup>	Yes	Tag scars conspicuous; scars in 2023 appear healed without signs of infection.
D403 (U)	Confirmed satellite tag (U)	2005	2005	Presumed female	Yes	Tag scar conspicuous (one on each side) with infection intermittently throughout sighting history but not visible in 2023.
D75 (U)	Possible satellite tag (U)	2005	2005	Presumed female	Yes	Tag scar conspicuous, some dark coloration in scars in 2023.

<sup>1</sup> Genetic sex from satellite tag samples analyzed by Greg O ‘Corry-Crowe, Florida Atlantic University (Shelden et al. 2018).

### 2023 Resightings of belugas biopsied 2016–2019

During a NMFS-led CIBW remote biopsy study conducted between 2016 and 2019, 51 belugas were biopsied. Photographs of these individuals were examined for matches to the CIBW Photo-ID catalog for long-term sighting and reproductive histories. See report #3 for information about the reproductive histories of the biopsied females. Fourteen of the identified biopsied individuals were photographed in 2023 (Table 2). Thirteen belugas appear to have healed biopsy scars with no signs of infection, while one beluga (D2379) had a biopsy scar that appeared unhealed and dark. Photographs of select biopsy scars resighted in 2023 are in Figure 2.

Table 2. Summary of photographic matches of individual belugas photographed in 2023 that were also biopsied during the 2016–2019 Cook Inlet Beluga Biopsy Study. Individuals with more than one biopsy are noted by colored cells of matching colors. Matches between the CIBW Photo-ID Project catalog and biopsy photos are updated semi-annually; please contact Tamara McGuire (tamaracookinletbelugas@gmail.com) before using the data in this table as results may have changed as cataloging is ongoing. Genetic sex from biopsy samples analyzed by Nick Keller, NMFS Southwest Fisheries Science Center, and Kim Parsons, NMFS Northwest Fisheries Science Center.

Biopsy Date	Biopsy Sample ID	Photo-ID Catalog ID	First Identified in Catalog	Genetic Sex	Side of Whale Biopsied	Biopsy Scar Comment
<b>2016</b>						
20-Aug	DL-CIB16-36	D220	2005	F	Left	No signs of infection of biopsy scar in 2023.
<b>2017</b>						
2-Sep	DL-CIB17-02	D19173	2014	F	Right	No signs of infection of biopsy scar in 2023.
2-Sep	DL-CIB17-03	D2379	2005	M	Right	Struck-with-sample on 31-Aug-2019 (left), DLCIB19-07; no signs of infection of biopsy scar in 2023.
3-Sep	DL-CIB17-05	D1187	2008	M	Right	No signs of infection of biopsy scar in 2023.
9-Sep	DL-CIB17-10	D326	2005	F	Right	No signs of infection of biopsy scar in 2023.
9-Sep	DL-CIB17-11	D3813	2010	F	Left	No signs of infection of biopsy scar in 2023.
<b>2018</b>						
9-Sep	DL-CIB18-06	D595	2007	M	Right	struck-with-sample; also struck-no-sample on 6-Sept-2018, DLCIB18-hitnosample-4; No signs of infection of biopsy scar in 2023.
9-Sep	DLCIB18-04	D85	2005	M	Right	Also struck-with-sample 10-Sep-2018, DLCIB18-10 (left) and struck-with-sample 12-Sep-2018, DLCIB18-18 (right), awaiting genetic confirmation of multiple biopsies of same individual; No signs of infection of three biopsy scars in 2023.
10-Sep	DLCIB18-10					
12-Sep	DLCIB18-18					
10-Sep	DLCIB18-09	R17121	2014	F	Right	No 2023 photos of scar area.
11-Sep	DLCIB18-14	D17286	2014	F	Left	No signs of infection of biopsy scar in 2023.
12-Sep	DLCIB18-20	D11374	2008	M	Right	No signs of infection of biopsy scar in 2023.
<b>2019</b>						
31-Aug	DLCIB19-07	D2379	2005	M	Left	Biopsy site appeared infected (raised and dark) in 2020 and 2021. No sign of infection in 2022, <b>appears dark in 2023</b> ; right-side struck-with-sample on 2-Aug-2017, DL-CIB17-03.
29-Aug	DLCIB19-04	R3235	2009	M	Right	No signs of infection of biopsy scar in 2023.
31-Aug	DLCIB19-10	D3833	2009	F	Left	No signs of infection of biopsy scar in 2023.
13-Sep	DLCIB19-14	D25	2005	M	Left	No signs of infection on left flank, but no photographs of biopsy dart making contact in 2019 so can't be sure of exact place on left flank where sample was taken.

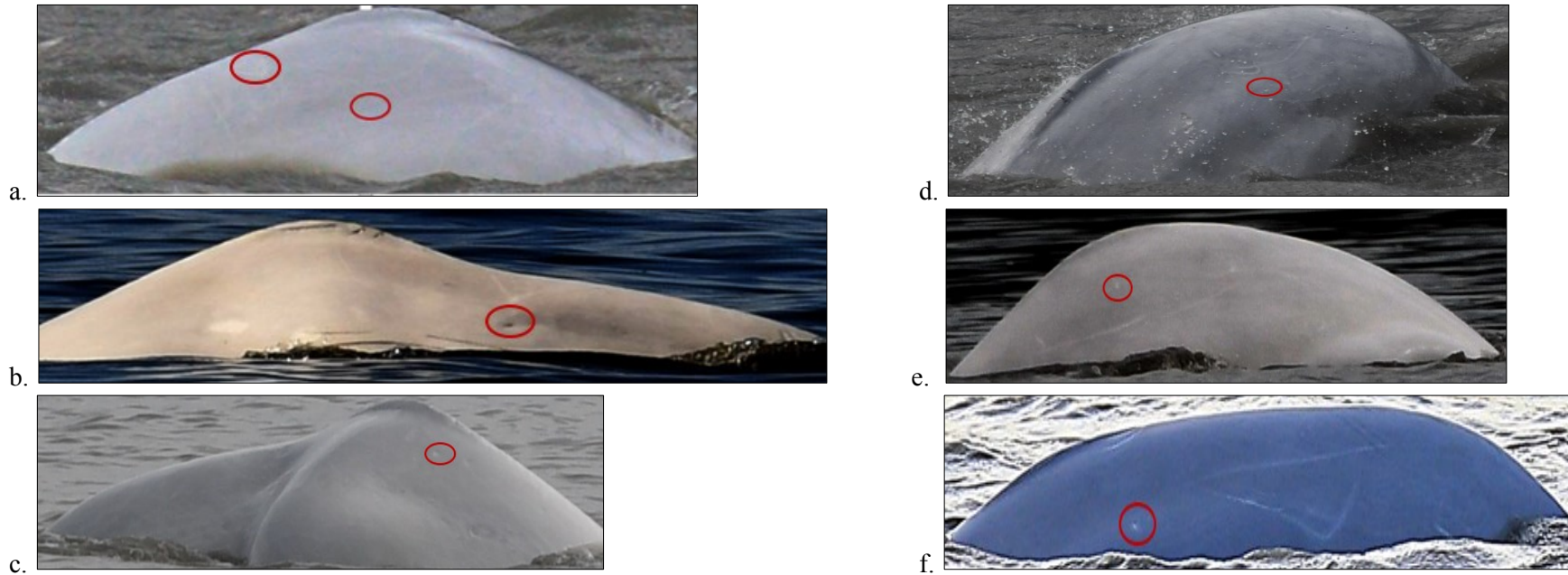


Figure 2. Photographs taken in 2023 of belugas biopsied in a NMFS-led study 2016–2019. Biopsy sites are denoted with an ellipse; a) right side of beluga D85, b) left side of beluga D2379 (photo courtesy of Ariel Brewer, NMFS Research Permit #25563), c) right side of beluga D2379, d) left side of beluga D3833, e) right side of beluga D11374, and f) left side of beluga 17286. Contrast has been adjusted in some photos to highlight the biopsy scars; photograph b has not been adjusted.