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 2022

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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 2022, 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 2022.* Details of the long-term Photo-ID Project background and methods can be found in previous project reports, available at www.cookinletbelugas.com.

Results

2022 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 Shelden et al. (2018). Five (25%) of the 20 CIBWs originally captured and/or tagged between 1999 and 2002 were photographed in 2022: 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).

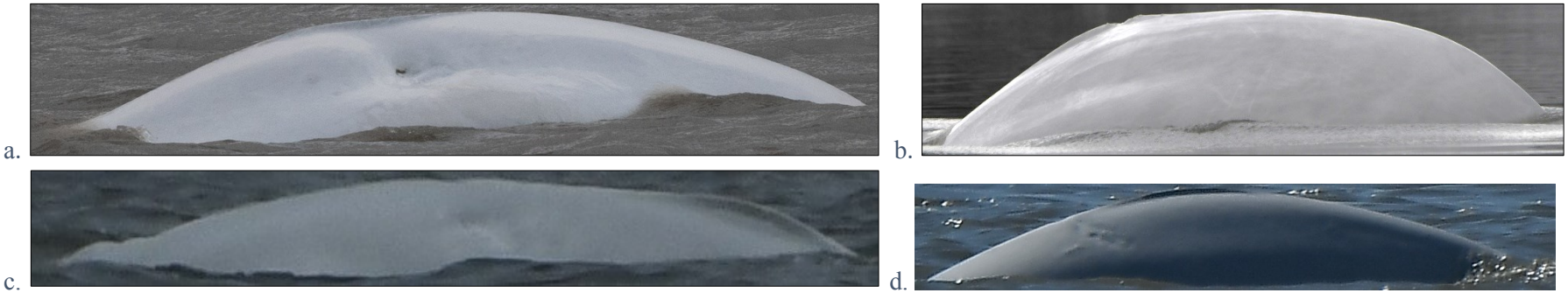

Figure 1. Photographs of four of the five belugas documented in 2022 who are confirmed or possible satellite-tagged whales from the tagging study conducted by NMFS from 1999 to 2002. a) beluga D49 – left side, confirmed satellite-tag scar; b) D111 – left side, confirmed satellite-tag scar; c) D403 – left side, confirmed satellite-tag scar; d) D3024 – left side, possible satellite-tag scar.

Table 1. Sighting records of satellite-tagged (confirmed and possible) individuals in the 2005–2022 CIBW Photo-ID Catalog and photographed in 2022, 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.

Photo-ID # (NMFS tagging ID #)	Research Scar (Year)	First Identified in Catalog	Scar First Photographed	Sex[1]	Last Photographed	Photographed with a Calf Born Post Tagging (2005-2022)	Research Scar Sighting History (see Figure 1 for most-recent photos)
D49 (unable to match)	Confirmed satellite tag (unknown)	2005	2005	Presumed female	2022	Yes	Tag scars (one on each side, below dorsal ridge) conspicuous with possible infection intermittently throughout sighting history including dark coloration in 2021 and 2022.
D111 (CI-00-02)	Confirmed satellite tag (2000)	2005	2000[3]	Female[1]	2022	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[3]	Female[1]	2022	Yes	Tag scars conspicuous; one of three scars appears healed with possible infection in deepest parts of the remaining two scars.
D403 (unable to match)	Confirmed satellite tag (unknown)	2005	2005	Presumed female	2022	Yes	Tag scar conspicuous (one on each side) with infection intermittently throughout sighting history.
D3024 (unable to match)	Possible satellite tag (unknown)	2009	2009	Presumed female	2022	Yes	Tag scar conspicuous with no signs of infection.

[1] Genetic sex from satellite tag samples analyzed by Greg O 'Corry-Crowe, Florida Atlantic University (Shelden et al. 2018).

[2] Confirmed as carcass or presumed if not photographed since 2009. COD = cause of death assigned at necropsy.

[3] Scar appeared fresh.

2022 Resightings of belugas biopsied 2016–2019

During a NMFS-led CIBW remote biopsy study conducted between 2016 and 2019, 50 belugas were biopsied. Photographs of these individuals were examined for matches to the CIBW Photo-ID catalog for long-term sighting and reproductive histories. Twelve of the identified biopsied individuals were photographed in 2022 (Table 2). Photographs of select biopsy scars resighted in 2022 are in Figure 2; none of the photographed scars appeared infected.

Table 2. Summary of photographic matches of individual belugas photographed in 2022 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.

Biopsy Date	Biopsy Sample ID	Photo-ID Catalog ID	First Identified in Catalog	Genetic Sex[1]	Side of Whale Biopsied	Biopsy Scar Comment
2016						
20-Aug	DL-CIB16-36	D220	2005	F	Left	Scar not visible in 2022 photos, unable to evaluate healing.
2017						
2-Sep	DL-CIB17-02	D19173	2014	F	Right	Scar not visible in 2022 photos, unable to evaluate healing.
2-Sep	DL-CIB17-03	D2379	2005	M	Right	Struck-with-sample on 31-Aug-2019 (left), DLCIB19-07; scar appears healed in 2022.
9-Sep	DL-CIB17-12	D18993	2016	F	Right	Scar looks healthy although 2022 photos are grainy.
2018						
30-Jul	DLCIB18-HNS-03	L34922	2018	Unknown	Left	Struck-no-sample
9-Sep 10-Sep 12-Sep	DLCIB18-04	D85	2005	M	Right	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; scar appears healed in 2022.
10-Sep	DLCIB18-09	R17121	2014	F	Right	No 2022 photos of scar area.
11-Sep	DLCIB18-12	D20266	2012	F	Left	Scar appears healed in 2022.
12-Sep	DLCIB18-20	D11374	2008	M	Right	Scar appears healed in 2022.
2019						
31-Aug	DLCIB19-07	D2379	2005	M	Left	Biopsy site appeared infected (raised and dark colored) in 2020 and 2021 and completely healed in 2022; right-side struck-with-sample on 2-Aug-2017, DL-CIB17-03.
31-Aug	DLCIB19-08	R16674	2012	F	Right	Biopsy site appears healthy.
31-Aug	DLCIB19-10	D3833	2009	F	Left	Biopsy site appears healthy.
31-Aug	DLCIB19-11	L27193	2017	F	Left	Biopsy site not visible in 2022 photos.

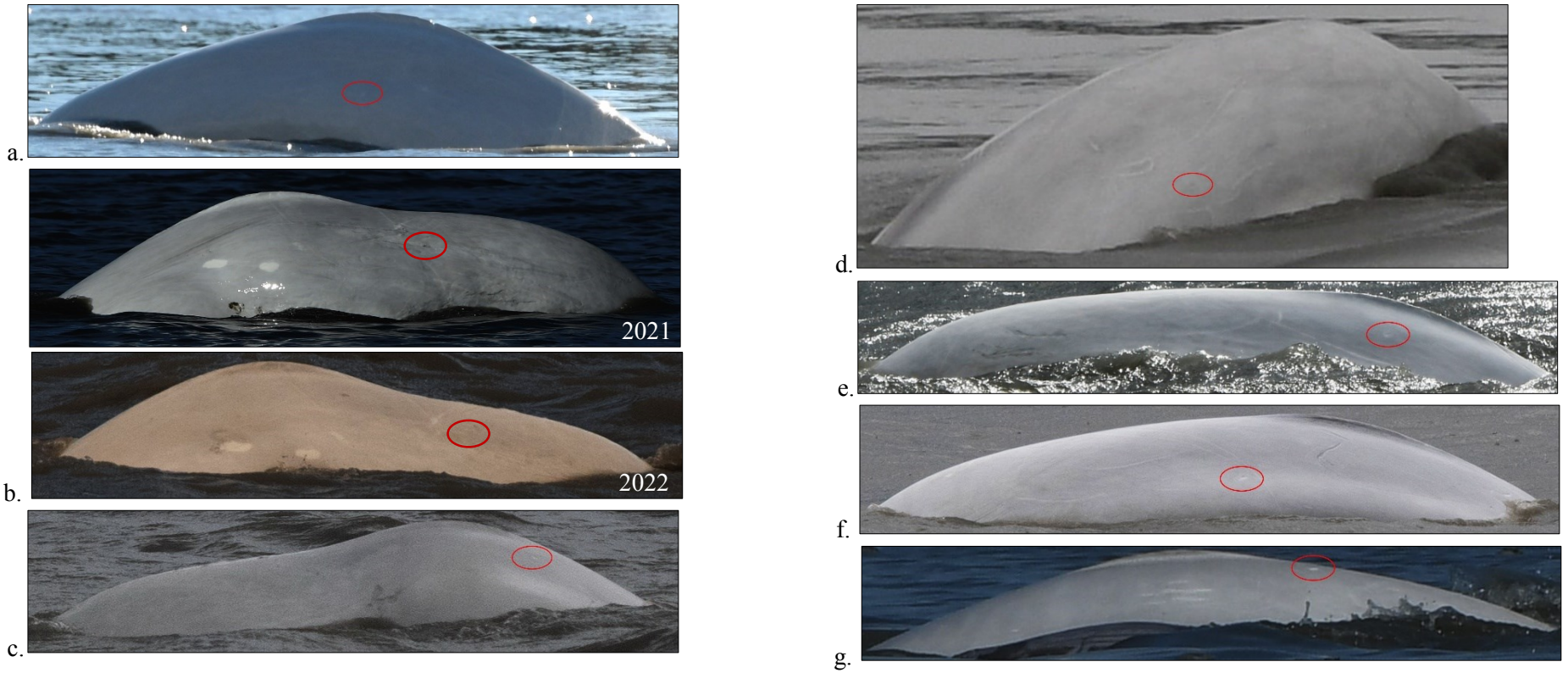

Figure 2. Photographs taken in 2022 of belugas biopsied in a NMFS-led study 2016–2019. Biopsy sites are denoted with an ellipse; a) right side of beluga D85, b) left side of beluga D2379 in 2021 (top) and in 2022 (bottom), c) right side of beluga D2379, d) left side of beluga D3833, e) right side of beluga D11374, f) right side of beluga D16674, and g) left side of beluga D20266.