

## Report #5: Photo-Identification of Beluga Whales in Cook Inlet, Alaska:

**Summary of human interactions: observations of human activities (non-research) during beluga surveys and signs of anthropogenic trauma (entanglement, puncture, vessel strike) in 2024**

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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 2024, identify individual whales from photographs, and summarize results in a series of six reports. This report, the fifth in the series, is entitled, *Summary of human interactions: observations of human activities (non-research) during beluga surveys and signs of anthropogenic trauma (entanglement, puncture, vessel strike) in 2024*. 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

### Observations of human activities (non-research) during beluga surveys in 2024

Human activities occurring in the vicinity of encountered groups with the potential to affect belugas were noted during photo-ID surveys (Table 1). The majority of observed human activities were incidental in the sense that most people appeared to be unaware of the presence of belugas. Aircraft activity (e.g., small recreational and commercial planes and helicopters, large commercial aircraft for cargo and passengers, military fighter and transport aircraft) was the human activity most commonly noted. Other human activities that were observed near belugas included vessel-based shipping/transport, vessel-based duck hunting, vessel-based seal hunting by Alaska Natives, vessel-based fishing, the train whistle along Turnagain Arm and at Ship Creek, surfers and kayakers in Turnagain Arm, noise from explosions assumed to be associated with military exercises along Knik Arm, and noise from gunshots near the Beluga River, vehicles being driven on the beach in the Kenai River, and near-shore construction in Turnagain Arm.

Table 1. Human activities observed in the vicinity of belugas during surveys in 2024, according to months and survey area. No surveys were conducted during January, February, or June. x = no effort, 0 = no belugas, A = aircraft, V = vessel, T = train (whistle, railroad service trucks on track).

Month	Susitna River Delta	Knik Arm	Turnagain Arm	Kenai River Delta
March	x	x	0	A
April	x	x	A	A
May	x	x	0	A
June	x	x	x	x
July	A	x	x	x
August	A, noise of gunshots from shore	A, V	A, T, V, F, surfers, kayakers	A, V, motorcycle on beach near water's edge
September	x	A, V, T	A, T, V	A, V, duck hunters, truck on beach near water's edge
October	x	A, V, noise from explosions	A, V, windsurfers/surfers, pile driving/near-shore construction	A, V, duck hunters, seal hunters,
November	x	x	x	A, V
December	x	x	x	A

## Signs of anthropogenic trauma (entanglement, puncture, vessel strike) in 2024

All photos of identified whales photographed in 2024 were examined for signs of anthropogenic trauma. Signs could include scars, or the presence of external objects (e.g., fishing or boat lines, tires). Categories of scars were developed by comparing scars and deformities seen on individuals in the CIBW Photo-ID Project catalog and stranding photos to descriptive classifications and photographs of injuries to other marine mammal species. Marks that likely came from non-anthropogenic sources such as competition, predation, disease, and the physical environment are not included in this summary. Scars from research (e.g., satellite tags and biopsy) were not included in this analysis but are summarized in report #4. Signs of trauma appearing to be consistent with anthropogenic sources were categorized as three types: puncture, vessel strike, or entanglement. Signs were then classified as confirmed (unambiguous evidence, such as an attached rope or bleeding propellor marks), possible (ambiguous, the mark also could have been from another source or non-human related), or no (without any evidence of anthropogenic trauma) in each of the scar type categories.

Results from the 2024 photo review are summarized according to 83 right-side individuals (Table 2), 104 left-side individuals (Table 3), and 87 combined dual-side individuals (Table 4). Of the identified belugas photographed in 2024, approximately a third of individuals in each catalog (right-side, left-side, dual) had signs of possible anthropogenic trauma, and 2% had evidence of confirmed anthropogenic trauma.

Table 2. Summary of belugas photographed in 2024 in the right-side CIBW Photo-ID catalog with signs consistent with anthropogenic trauma from entanglement, vessel strikes, and non-research punctures (i.e., excluding biopsy and tag scars). These data are preliminary and possible scar source merits further evaluation.

<b>83 Right-side Whales Photographed in 2024</b>	<b>Possible</b>	<b>Confirmed</b>
Total Number of Whales with Puncture Scars	6	0
Total Number of Whales with Vessel-Strike Scars	10	1
Total Number of Whales with Signs of Entanglement	9	1

Table 3. Summary of belugas photographed in 2024 in the left-side CIBW Photo-ID catalog with signs consistent with anthropogenic trauma from entanglement, vessel strikes, and non-research punctures (i.e., excluding biopsy and tag scars). These data are preliminary and possible scar source merits further evaluation.

<b>104 Left-side Whales Photographed in 2024</b>	<b>Possible</b>	<b>Confirmed</b>
Total Number of Whales with Puncture Scars	8	0
Total Number of Whales with Vessel-Strike Scars	11	1
Total Number of Whales with Signs of Entanglement	10	1

Table 4. Summary of belugas photographed in 2024 in the dual-side CIBW Photo-ID catalog with signs consistent with anthropogenic trauma from entanglement, vessel strikes, and non-research punctures (i.e., excluding biopsy and tag scars). These data are preliminary and possible scar source merits further evaluation.

<b>87 Dual-side Whales Photographed in 2024</b>	<b>Possible</b>	<b>Confirmed</b>
Total Number of Whales with Puncture Scars	7	0
Total Number of Whales with Vessel-Strike Scars	9	1
Total Number of Whales with Signs of Entanglement	12	1

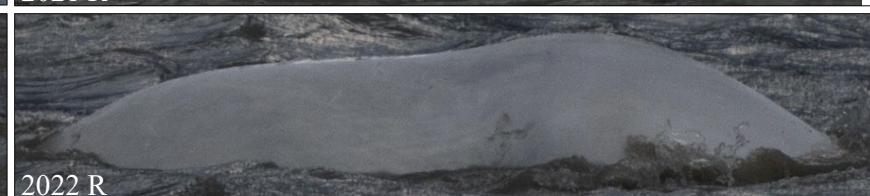
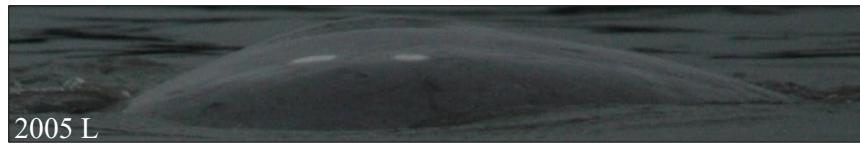
Most of the “possible” cases of anthropogenic trauma photographed in 2024 had been noted in previous years. Both “confirmed” cases with signs of anthropogenic trauma were first documented in 2024:

- Beluga L48325 was first identified in 2023, and was photographed on two occasions, both in Turnagain Arm. In 2024, it was photographed on July 23 in the Susitna River Delta, without vessel-strike scars. On July 24, it was again photographed in the Susitna River Delta, first without scars, then with fresh scars; it was later determined to have been struck at low speeds by a small boat (not associated with the CIBW Photo-ID Project). It has not been identified in survey photos taken after July 24.
- Beluga L43195 was first photographed in 2021 in the Susitna River Delta, without signs of entanglement. On October 1, 2024, observers working in conjunction with the Port of Alaska photographed the beluga with a tire, or tire-flap like, black object encircling the body in front of the dorsal crest. Despite NMFS-led concerted efforts to locate the whale from vessel and shore, it was not photographed again in 2024.

### **Injury or Disease of Unknown and/or Multiple Origins**

We do not know the cause, or causes, of the dorsal concavity (“swayback”) exhibited by several whales in the catalog. Two whales with swaybacks were photographed in 2024. Beluga D2379 is shown as an example in Figure 1. Possibilities are human-induced injury (e.g., vessel strike, gunshot, or entanglement), or natural injury (e.g., predation attempt, disease, emaciation, scoliosis, or genetic deformity), or some combination of the above. This beluga has a concave back, but also a large scar along its flank.

One possible source of infection that we hope to learn more about is the pathogen, *Erysipelothrix rhusiopathiae*, which can result in skin lesions and arthritis. Veterinarians with the Alaska Marine Mammal Stranding Network report that this pathogen has been found in CIBWs (Rouse, N., Huntington, K.B., Goertz, C., Hunter, N., Radhakrishnan, S. and Forde, T., 2025. *Erysipelothrix in Cook Inlet, Alaska, USA: an emerging bacterial pathogen of the endangered Cook Inlet beluga whale*. *Diseases of Aquatic Organisms*, 163, pp.1-16.), and we are curious to investigate if some of the skin lesions and spinal curvature we are photo-documenting might be associated with this pathogen. We will continue to follow these whales photographically, share their photographs with veterinarians with the Alaska Marine Mammal Stranding Network, and continue to screen all whales in the catalog for these deformities. Examination of the skeletons of these whales after they die may provide insight into the cause of the deformity.





2024 L



2024 R

Figure 1 Beluga D2379. Note the pronounced concavity behind the dorsal crest in 2017 and following years that was not present in 2005. The concavity was detected in 2008 and appeared to worsen through 2021. Photos in 2019, and again in 2024, show discoloration on the right side which may be from a diatom infestation or an infection of unknown origin. This whale was not photographed in 2020. Both sides of the whale were photographed in 2022 and the whale appeared slightly less emaciated than the year before, resulting in a slightly less concave appearance, although this could be due to the fact that the whale was photographed in October in 2022, whereas in previous years it had been photographed May-August, earlier in the ice-free season when it would not have had as many months to feed on migratory prey. However, photos of both sides of the whale in 2023 indicate poor body condition in September 2023, a month when most of the belugas appear to be at peak body condition. Photographs of both sides of the whale were taken in September 2024, when body condition appeared slightly better than the previous year. L=left side; R=right side.