

Survival of a common bottlenose dolphin calf with a gunshot wound to the melon

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Gun-shot injuries and fatalities are common in pinnipeds worldwide, but rarer in odontocetes. Shootings of odontocetes around North America have been previously reported in several locations, including Newfoundland (Higdon & Snow 2008), the Gulf of Mexico (Morgan & Patton 1990), off the west coast (Leatherwood et al. 1980; Danil et al. 2010; Bigg et al. 1987), and Hawai‘i (Shallenberger 1981; Baird 2016). Shootings are reported to occur in response to depredation of bait or catch from fishermen (Morgan & Patton 1990; Baird 2016), and opportunistic hunting (Higdon & Snow 2008), though confirming the circumstances behind gunshot wounds after their occurrence remains challenging at best and is frequently not undertaken. In Hawai‘i, some species of odontocetes depredate fish in hook and line fisheries, and anecdotal accounts indicate that fishermen occasionally shoot at odontocetes to deter them from stealing bait or catch (Shallenberger 1981; Baird 2016). Gunshot wounds could result in serious injury or mortality of individuals, and therefore are of concern to policymakers.

Common bottlenose dolphins (*Tursiops truncatus*) are a regularly encountered species in Hawai‘i that live in four independent island-associated resident populations around Kaua‘i/Ni‘ihau, O‘ahu, Maui Nui (including Maui, Lāna‘i, Kaho‘olawe, and Moloka‘i), and Hawai‘i Island, as well as a separate offshore population (Baird et al. 2009; Martien et al. 2011). The total abundance of common bottlenose dolphins within the Hawaiian Exclusive Economic Zone has been estimated at 21,815 individuals (CV = 0.57; Bradford et al. 2017), though the abundance of the resident populations are generally thought to be in the low hundreds (Baird et al. 2009).

Here, we report an incident in which a resident common bottlenose dolphin calf in Hawaiian waters was apparently shot through the melon and survived for at least four months subsequent to the shooting. To our knowledge, this is the first documented account of an odontocete surviving a gunshot wound through the head.

The likely mother of the calf, individual HITt0538 in the Cascadia Research Collective Hawai‘i bottlenose dolphin photo-identification catalog, was first documented off O‘ahu in 2007 and had been seen on 22 days in seven different years prior to being documented with the calf (HITt1093) on 10 November 2017. These individuals have been documented associating with other individuals from the resident O‘ahu social network (Baird et al. 2009) of bottlenose dolphins. The mother/calf pair was seen on three additional occasions and photos of the melon of the HITt1093 as recent as 30 April 2018 showed no evidence of a wound (Table 1). Photos

obtained on 30 June 2018 by a tour operator off O‘ahu showed an irregularly shaped fresh wound on the left side of the melon. A subsequent encounter on 14 July 2018 provided additional high quality photos (Figure 1) suggesting a gunshot wound to the melon. Photos show a small, round wound with inverted margins on the right side of the melon consistent with a bullet entry wound, and a more irregular shaped wound with granulation tissue and an extruded margin on the left side, consistent with an exit wound. The calf did not display any unusual behaviors during the encounters on 30 June or 14 July, swimming closely alongside HITt0538 for the duration of both encounters and surfacing at regular intervals.

At the next sighting of the calf with its mother on 1 October 2018, the skin had healed over the entry and exit wounds leaving small depigmented scars. At the most recent sighting on 6 November 2018 the only remaining evidence of injury were the small de-pigmented scars on opposite sides of the melon that match with the locations of the assumed entry and exit wounds (Table 1, Figure 2). To date, no obvious changes in body condition have been identified, indicating that the injury has likely conferred no significant lasting damage to the animal’s overall health.

This report presents evidence that Hawaiian odontocetes are at least occasionally shot by humans, likely as a result of perceived or actual interactions with fisheries (Shallenberger 1981; Baird 2016), and also appears to represent the first known survival of an odontocete with a gunshot wound to the head. Additionally, this report highlights the importance of citizen science contributions in the monitoring of odontocete populations, as without regular photo contributions from community members both the initial injury and its healing could not have been monitored so closely.

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Figure 1. Photographs of a bottlenose dolphin calf HITt1093 with gunshot wound visible on the right (top) and left (bottom) sides of the melon 14 July 2018. The accompanying adult is likely the mother based on close proximity during all encounters of the calf. Photos by Chuck Babbitt.



Figure 2. Photographs of bottlenose dolphin calf HITt1093 with largely healed wound visible on right (top) and left (bottom) sides of the melon, 6 November 2018. Photos Ocean Joy Cruises (top), Paul Johnson (bottom).

Table 1. Sighting details of bottlenose dolphin HIT1093 prior to and following the injury.

Date	Source	Side of melon visible	Appearance of wound site
10-Nov-17	Dolphin Excursions	None	N/A
6-Dec-17	Ocean Joy Cruises	Both	No wound
26-Apr-18	Ocean Joy Cruises	Right	No wound
30-Apr-18	Ocean Joy Cruises	Right	No wound
30-Jun-18	Wild Side Specialty Tours	Left	Apparent fresh exit wound on left with pink tissue, possibly concave center, and extruded margin
14-Jul-18	C. Babbitt	Both	Small round entry wound on right side with evidence of healing; exit wound on left appears flat, with pink tissue still visible and extruded margin
1-Oct-18	Ocean Joy Cruises	Both	Small depigmented scar on right at site of entry wound; exit wound appears flat, healed, patchy network of depigmented scars visible
11-Oct-18	Dolphin Excursions	Right	Small depigmented scar on right at site of entry wound
5-Nov-18	Ocean Joy Cruises	Left	Exit wound on left appears mostly flat, with a patchy network of depigmented scars
6-Nov-18	Dolphin Excursions	Right	Small depigmented scar on right at site of entry wound
6-Nov-18	Ocean Joy Cruises	Both	Scar on right not visible; exit wound may be slightly concave, with patchy network of depigmented scars that have markedly shrunk in size