Short Note

While There's Life, There's Hope: A Successful Case of Reintroduction of a Stranded Humpback Whale Calf in Espírito Santo, Brazil

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Humpback whales (*Megaptera novaeangliae*) are a highly migratory species that annually cross the world's oceans (Rizzo & Schulte, 2009; Fleming & Jackson, 2011). In the Southern Hemisphere, humpback whales undertake extensive migrations from feeding grounds in high-latitude regions in summer to tropical and subtropical waters during the winter, where breeding and calving occur (Clapham & Mead, 1999; Siciliano et al., 1999; Rizzo & Schulte, 2009; Clapham, 2018).

In Brazil, the primary breeding grounds for humpback whales are located along the northeastern coast, mainly in the Abrolhos Bank region and its surroundings due to its shallow and warm waters, protected by a mosaic of coral reefs (Leão & Kikuchi, 2001; Zerbini et al., 2004; Siciliano et al., 2012). Along their migratory route, before reaching their final breeding destination, humpback whales are commonly observed in various locations along the southeastern Brazilian coastline (Siciliano, 1995; Siciliano et al., 2012; Lodi et al., 2020).

During these migrations, stranding events are common and offer valuable opportunities for assessing species' health and disease status, advancing scientific knowledge about cetaceans in ways that would otherwise be impossible to achieve (Perrin & Geraci, 2009; Moore et al., 2018; Mayorga et al., 2020). Additionally, such wildlife management events play a crucial role in the welfare and survival of animal species, serving as a critical component of broader conservation strategies to preserve biodiversity. In response to these stranding incidents, a Brazilian protocol was established to standardize care procedures and create an information network (Instituto Brasileiro do Meio Ambiente e dos Recursos Naturais Renováveis [IBAMA], 2005). This initiative facilitates collaborative decisionmaking in the care of species, promoting research for conserving and managing aquatic mammals within the country.

Despite the existence of national guidelines, the management of complex cases, such as live cetacean strandings, remains challenging. These situations often require human intervention, but there is limited empirical evidence to guide management decisions (Boys et al., 2022). Among the available options for managing live-stranded animals, euthanasia is frequently considered as a means to end the suffering of the animal, particularly in the case of calves that are often strong candidates for this procedure due to their dependence on their mothers at that stage (Perrin & Geraci, 2009; Boys et al., 2022). However, the decision to proceed with euthanasia is difficult regardless of the phase of life, and many factors have to be taken into account, including the animal's size, the presence of the local community (i.e., requiring communication to explain the reasons and procedures, ideally with minimal public presence and proper area isolation), the kind of procedure to be adopted (chemical, physical, or both), and the potential of the animal's rehabilitation (IBAMA, 2005). Given the complexity of these factors, such a significant decision must be made by trained professionals who must also be prepared to respond quickly and in an organized manner in cases where rehabilitation and reintroduction into the wild are feasible (Geraci & Lounsbury, 2005; U.S. Marine Mammal Health and Stranding Response Program, 2022a, 2022b).

Herein, we report a rare and successful case of a humpback whale calf that lost contact with its mother and became stranded in a coral reef on the southeast coast of Brazil. This case provides valuable insights into the challenges and considerations involved in managing live-stranding events, particularly in situations where the standard approach, such as euthanasia, may not be the mandatory course of action.

Case Description

On 16 September 2023, a live female humpback whale calf measuring 4.60 m in length and with an estimated weight of around 1,500 kg was reported stranded at Manguinhos in Serra, Espírito Santo, Brazil (Figures 1 & 2). The calf was initially returned to the water by the local community. However, on the following day, 17 September 2023, at 0800 h, we were notified that the same individual was re-stranded in the same area. The animal exhibited various abrasions all over its body, and its left pectoral fin was observed to be positioned beneath its body.

Following Brazilian guidelines for handling the stranding of aquatic mammals (IBAMA, 2005), the assessment team utilized light-colored cotton

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cloths and sunshades to regulate the animal's body temperature and protect it from solar radiation. Additionally, the animal was constantly wetted with seawater to minimize the stress (Figure 2B).

During the rescue operation, the animal's evaluation included a patient history, physical examinations, and blood sample collection for laboratory tests to assess its overall health status. The physical assessment involved an external examination of epidermal lesions, palpebral reflexes, and cardiac and respiratory frequencies. Prognostic evaluations, based on the physical assessment, indicated that the animal exhibited a normal body condition score. Respiratory and cardiac rates were stable, palpebral reflexes were responsive, and the epidermal lesions were superficial, posing no threat to the animal's life.

Laboratory analysis of blood samples (complete blood count and standard serum chemistry tests) revealed some altered parameters, likely due to the stress the animal experienced and intrinsic organ compression, which resulted in hepatic and musculoskeletal changes. However, there were no signs of infection. The blood samples also

40°11'15"

-40°11'

40°11'30

40°11'45

<complex-block>

Figure 1. Location of the humpback whale (*Megaptera novaeangliae*) calf stranding in coral reefs in Manguinhos, Serra, Espírito Santo, Brazil, on 17 September 2023. The star represents the exact sighting area.



Figure 2. The stranded humpback whale calf on the coral reef (A). The rescue team applied cotton cloths and used sunshades to help regulate the calf's body temperature and protect its skin from solar radiation (B & C). (Photographs courtesy of the ORCA Institute Personal Archive)

facilitated the identification of the animal's sex as female through DNA extraction using the polymerase chain reaction (PCR) technique (Gilson et al., 1998) as the reproductive organs were not visible due to the animal's position on the rocks. Overall, the animal was considered to be in good health.

However, even in healthy conditions, it must be considered that the connection between mother and calf is crucial for guaranteeing the welfare and survival of the calf, and their dependence may continue even after the lactation phase. In this context, maternally dependent calves persistently re-strand due to their inability to successfully navigate, feed, and integrate in general into the wild. For this reason, they are typically candidates for euthanasia (Perrin & Geraci, 2008; Boys et al., 2022). Given the case presented here, euthanasia was the first option to be considered despite the good health of the animal, and the trained assessment team was prepared with all the facilities and equipment available (Heyning & Heyning, 2001).

The scenario changed when, after approximately 2 h of care, a female adult humpback whale, assumed to be its mother since there was no sign of other whales around, was sighted swimming and spouting behind the coral reefs. The adult whale exhibited surface movements such as raising her head vertically out of the water, slapping the water with her flippers, and even propelling herself completely out of the water. The calf, in response, became more agitated, vocalizing, moving its head, and striking with its caudal fin, which suggests an interaction between them. The contact with the mother could encourage the calf to follow her movements back to deeper waters, thereby leading it away from the dangerous shallow area while ensuring fundamental care (Szabo & Duffus, 2008). Considering this scenario and the calf's health condition, the option of reintroducing the animal became an option, thereby avoiding euthanasia.

As the tide rose, the rescue team used straps to support the calf and release its pectoral fin. Upon evaluation, it was found that the fin displayed natural movements, with no fractures or dislocations. Given the persistent presence of the adult whale and the responsive calf behavior described, it was decided to proceed with the reintroduction process, using the straps to guide the calf out of



Figure 3. The rescue team using straps to support and guide the stranded humpback whale calf towards deeper waters (Photograph courtesy of the ORCA Institute Personal Archive)

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Figure 4. Flowchart summarizing the steps involved in the rescue assessment process

the rocks and towards the mother (Figure 3). The calf then swam away, and the team aerially monitored the animal with a drone until it was out of range. Its swimming was within the natural pattern of the species; therefore, the team continued monitoring the animal from the beach. The entire operation, summarized in Figure 4, took approximately 7 h. After this process, the question that arose was whether the calf would find and follow its mother and if her care would be sufficient for its survival.

The success of the rescue was confirmed when 2 d after the reintroduction a monitoring team aboard a boat spotted the calf again alongside the mother. The calf was initially observed to have scars on its caudal fin, resembling a half-moon (Figure 5), which allowed us to confirm that it was the same individual. Therefore, in this case, even with the indications pointing towards euthanasia, the rescue team was able to successfully stabilize and reintroduce the animal given its good physical condition and the re-establishment of the mother-calf bond, representing an extremely rare successful case of reintroduction of a stranding whale calf. Moreover, the half-moon scar is a permanent and unique feature, much like fingerprints, which facilitates the identification of the animal for future studies (Figure 5). In fact, a second re-sight occurred in September 2024, demonstrating the significance of those marks and the success of the rescue.

Our case emphasizes the critical role of the mother-calf bond in the survival of calves in



Figure 5. Photograph depicting the scar on the humpback whale's caudal fin resembling a half-moon (indicated by the arrow) (Photograph courtesy of the ORCA Institute Personal Archive)

stranding events, providing empirical evidence to guide management decisions and illustrating the immediate impact of human interventions on the welfare and survival of live-stranded cetaceans. Furthermore, the presented case highlights the importance of a case-by-case approach in wildlife management, and underscores the need for continuous evaluation and adaptation of existing protocols to enhance conservation efforts for this species.

In this context, to better deal with such large animals' live-stranding situations in Brazil, in addition to the existing protocols for strandings in general (IBAMA, 2005), new protocols focused on euthanasia procedures were designed to provide a more detailed framework for when determining whether or not such a procedure should be carried out in cetaceans, and, if so, how to perform the procedure according to different conditions (Marcondes et al., 2023).

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