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Short Communication

Entanglement of Fin and Humpback Whales in Arraial do Cabo, Brazil: Emerging Challenges

Yaci Gallo Alvarez[1,2]*, Dora Barbalho Barreiros[2], Thadeu Burached Dias da Silva[2,3], Marcelo Francisco de Lima[2], Sarah Rodrigues Pessoa[2,3], Katia Regina Valente Medeiros Ferreira[2,3], and Jan Giorgio Nunes Lobo[2]

[1]*Programa de Pós-Graduação Dinâmica dos Oceanos e da Terra, Instituto de Geociências, Universidade Federal Fluminense, Av. Gen. Milton Tavares de Souza, Gragoatá, Campus da Praia Vermelha, Niterói, RJ, Brazil*

[2]*Fundação Municipal de Meio Ambiente, Pesquisa Ciência, Tecnologia, Esporte e Lazer de Arraial do Cabo, FUNTEC Ambiental, Rua Almirante Tamandaré, Canaã, Arraial do Cabo, RJ, Brazil*

[3]*Instituto Federal do Rio de Janeiro, Campus Arraial do Cabo, R. José Pinto de Macedo, Prainha, Arraial do Cabo, RJ, Brazil*

***Corresponding author:** Yaci Gallo Alvarez, Fundação Municipal de Meio Ambiente, Pesquisa, Ciência, Tecnologia, Esporte e Lazer de Arraial do Cabo – FUNTEC Ambiental Rua Almirante Tamandaré, Canaã, Arraial do Cabo, RJ, Brazil

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Abstract

Between 2024 and 2025, several cases of whale entanglements were documented off Arraial do Cabo, southeastern Brazil, through the land-based monitoring program Projeto Mar de Baleias. Records included humpback whales (Megaptera novaeangliae) entangled in ropes and anchoring systems, as well as a fin whale (Balaenoptera physalus) severely entangled in heavy cables around the head. In some events, whales managed to free themselves, while in others deep injuries were observed, including partial loss of pectoral fins. The fin whale case was particularly concerning due to the animal's weakened body condition and malnutrition. These observations were supported by citizen science reports and aerial drone monitoring. The records highlight the growing overlap between whale migratory routes and human activities along the Brazilian coast and underscore the need for measures to mitigate anthropogenic risks to large whales and underscore the need for integrated conservation strategies involving rapid-response disentanglement, citizen science, and environmental education.

Keywords: Marine mammal conservation; anthropogenic interactions; fishing gear entanglement; coastal management; cetacean monitoring

Introduction

Entanglement in ropes, nets, and anchoring systems is one of the primary anthropogenic threats to baleen whales, causing injuries, reduced mobility, and significant consequences for survival and population recovery [1-3]. Humpback whales (Megaptera novaeangliae) are the most frequently reported species in Brazilian waters due to their extensive coastal migration between Antarctic feeding grounds and breeding grounds in the northeast Brazil [4]. Fin whales (Balaenoptera physalus) are rare along the Brazilian coast, usually sighted alone or in pairs, with a few strandings and historical whaling records reported [5-7]. Arraial do Cabo, located in southeastern Brazil, is part of an important migratory corridor for baleen whales. The region experiences intensive human use,

including navigation, tourism, anchoring, and artisanal fishing. This spatial overlap between whales and human activities increases the likelihood of interactions and entanglement events [8]. In this study, we report entanglement cases documented between 2024 and 2025, highlighting their ecological significance for individual health and survival, and illustrating the conservation challenges for marine mammal management in Brazilian waters.

Discussion

Between 2024 and 2025, six entanglement events were documented off Arraial do Cabo: four involving humpback whales (Megaptera novaeangliae) and two involving fin whales (Balaenoptera physalus). Outcomes ranged from minor entanglements resolved spontaneously to severe injuries. Two events were particularly concerning. On 18 May 2025, a fin whale was documented with large cables tightly wrapped around its head, just posterior to the blowhole. The animal exhibited signs of malnutrition, remained in sheltered waters for several hours, and later resumed migration toward deeper northern waters (Figure 1). Subsequently, on 15 June 2025, a humpback whale had a rope entangled around its body, causing deep lesions and partial amputation of approximately one-third of each pectoral fin (Figure 2). Despite the severity of the injuries, the whale remained active, performing multiple breaches, pectoral slaps, and rolling behaviors. Both entangled individuals (fin and humpback whales) were accompanied by conspecifics that appeared uninjured. These cases illustrate the serious consequences of entanglement for individual health, mobility, and survival [9,10].

Figure 1: Fin whale (Balaenoptera physalus) observed on 18 May 2025 off Arraial do Cabo, Brazil, with large cables tightly wrapped around the head, posterior to the blowhole.

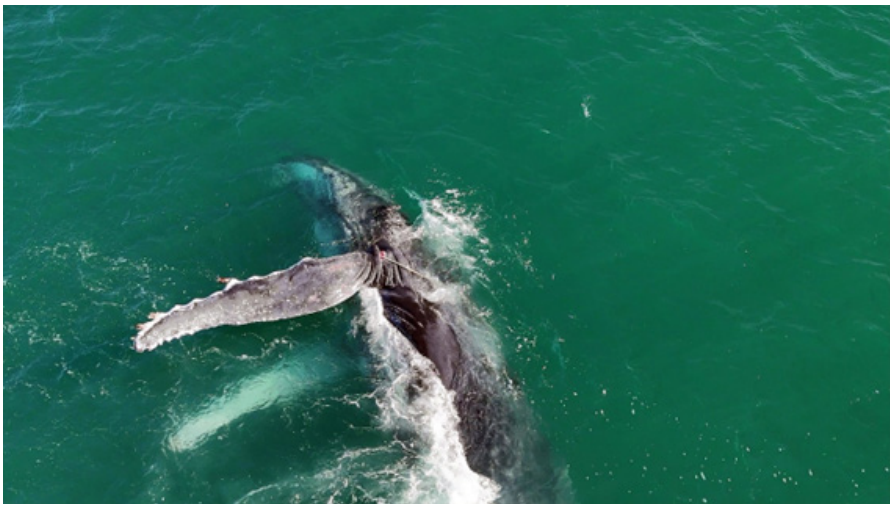

Figure 2: Humpback whale (Megaptera novaeangliae) observed on 15 June 2025 off Arraial do Cabo, Brazil, with rope entangled around the body causing deep lesions and partial amputation of approximately one-third of each pectoral fin.

Currently, disentanglement efforts in Brazil remain extremely limited, with only two specialized teams legally authorized and trained by competent authorities. Attempting disentanglement without proper training is prohibited, emphasizing the critical importance of expanding and formally regulating this capacity. Citizen science initiatives have proven valuable for early detection and monitoring of entanglement events and should be integrated with broader conservation strategies [11]. These observations underscore the increasing spatial overlap between large whale migratory corridors and human activities, including navigation, anchoring, and tourism. They highlight the need for conservation strategies that integrate rapid-response disentanglement capacity, citizen science, and environmental education initiatives targeting local communities [8,11,12] and schools [13]. Furthermore, incorporating ocean literacy principles ensures that conservation measures are informed by human experience and local knowledge, fostering participatory approaches, enhancing awareness, and promoting sustainable interactions with marine ecosystems [13].

Conclusion

The 2024–2025 entanglement cases off Arraial do Cabo highlight the consequences of increased spatial overlap between baleen whales and human activities in Brazilian coastal waters. Conservation efforts should prioritize prevention through regulated anchoring, awareness among maritime users, and expansion of rapid-response disentanglement networks. Additionally, the development of public policies and environmental education programs targeting both local communities and schools is essential to raise awareness and promote long-term stewardship of marine ecosystems through community engagement and ocean literacy initiatives.

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Conflict of Interest

The authors declare no conflicts of interest.

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