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Short Note

First Confirmed Record of Northern Bottlenose Whale (*Hyperoodon ampullatus)* in Madeira Archipelago, Northeast Atlantic

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The beaked whales (Family Ziphiidae) are one of the least known groups of cetaceans, primarily due to their oceanic nature, long dive durations, and cryptic behaviour (Hooker & Baird, 1999; Hooker et al., 2002; Reeves et al., 2002; Baird et al., 2005; Wenzel et al., 2013; Madsen et al., 2014). According to Whitehead & Hooker (2012), the northern bottlenose whale (*Hyperoodon ampullatus*) is the most well-studied species from this Family. Unlike other beaked whale species, this species is often described as curious and is attracted to stationary vessels as well as to fishery boats (Barlow et al., 2006). The northern bottlenose whale is among the deep-diving mammals, occurring mainly in waters deeper than 500 m where their main prey, squid of the genus *Gonatus*, is abundant (Santos et al., 2001; Committee on the Status of Endangered Wildlife in Canada [COSEWIC], 2002; Gowans, 2009; Whitehead & Hooker, 2012).

The northern bottlenose whale is found in the subpolar and cold temperate waters of the North Atlantic from approximately 80º N down to latitudes at the Azores of approximately 37º N (Gowans, 2009; Whitehead & Hooker, 2012). The southernmost existing record is from a stranded individual in the Canary Islands at approximately 29º N (Simmonds & Lopez-Jurado, 1991; Martin et al., 2004). In the eastern North Atlantic, data on population structure and migrations are few and confusing (Whitehead & Hooker, 2012).

The Madeira archipelago (northeast Atlantic, approximately 960 km from the Azores and 500 km from the Canary Islands) presents a high diversity of cetaceans, which have been the focus of legally regulated whale-watching activity since whaling ended in 1981 (see Figure 1). Freitas et al. (2012) compiled a checklist of cetaceans in Madeiran waters from different sources (e.g., scientific studies, whaling records, opportunistic sightings, strandings, among others) and accounted for 29 species of which 25 were accurately identified and four are considered to be nonconfirmed. The northern bottlenose whale is described as one of those nonconfirmed species based on four sightings registered between 2001 and 2008 from experienced observers but without photographic records and, therefore, without evidence that would allow confirmation by third parties.

The present study confirms, for the first time, the presence of the northern bottlenose whale in the Madeira archipelago, extending the list of cetaceans in Madeira to 26 confirmed species. The sighting was recorded by a whale-watching operator, and high-quality photographs were taken. A group of five to seven northern bottlenose whales were sighted on 3 October 2016 at 1120 h at 32º 45.567 N, 17º 14.417 W, approximately 9 km off the southwest coast of Madeira Island, over a bathymetry of 2,400 m. The group approached the boat and displayed a series of aerial behaviours. The sighting lasted for 5 min, after which the animals submerged and disappeared. Weather and sea conditions were very good, with a Beaufort Sea State of 0. The photographs captured the species' specific morphologic characteristics, such as the large bulbous forehead and short dolphin-like beak, along with the animals' coloration and large size (Gowans, 2009). It was also possible to identify one juvenile due to its smaller size and being accompanied by an adult, presumably its mother (Figure 2).

Although northern bottlenose whales in the Azores are considered to be common (Silva et al.,

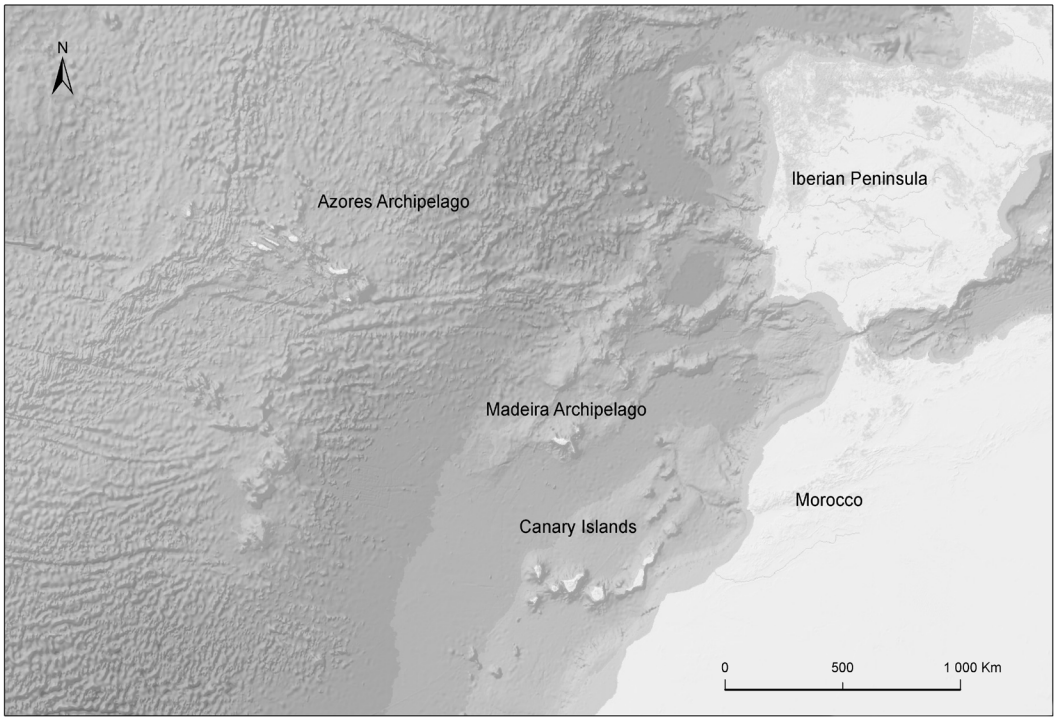

Figure 1. Map of the eastern North Atlantic, with the locations of the archipelagos of Madeira, Azores, and the Canary Islands

2014), in the Canary Islands, the only existing record for this species is of a stranded animal (Simmonds & Lopez-Jurado, 1991; Martin et al., 2004). To our best knowledge, the record described in this note constitutes the southernmost live at-sea sighting for this species. The present findings are important given that additional information on these species' occurrence and distribution can contribute to the development of appropriate conservation and management measures across its range, as well as increase the knowledge of this species that still has an International Union for Conservation of Nature (IUCN) status of "Data Deficient" (Taylor et al., 2008).

The sighting of this species in Madeira in autumn (October) could be due to spatial migrations. Observations of strandings and sightings along the shores of Europe have led to the hypothesis that northern bottlenose whales in the eastern North Atlantic may move northward in spring and southward in autumn (Christensen, 1993; MacLeod et al., 2004). However, information on the other sightings of this species in Madeira indicates their passage also occurs in summer (Freitas et al., 2012). Silva et al. (2014) noted that in the Azores, this species is present mainly in the summer, which does not support this hypothesis. Whitehead & Hooker (2012) raised a second theory that rather than a north–south migration, this species could make inshore–offshore movements following their prey, which could help explain these discrepancies (Silva et al., 2014). Similar to most marine mammal species, food availability along with predation risk are two of the main extrinsic factors (Acevedo-Gutiérrez, 2009) likely to influence the distribution of northern bottlenose whales. However, due to the scarcity of information on this species in this region of the Atlantic, it is only possible to speculate on their migrations (Whitehead & Hooker, 2012).

The three archipelagos of Madeira, Azores, and the Canary Islands present a high abundance of cetacean species (Carrillo et al., 2010; Freitas et al., 2012; Silva et al., 2014) but differ quite markedly when it comes to the occurrence of beaked whale species. In the Azores, the Sowerby's beaked whale (*Mesoplodon bidens*) is one of the most sighted species of beaked whales, and the northern bottlenose whale is common, although these are very rare in Madeira and the Canary Islands. In these latter areas, the Blainville's beaked whale (*Mesoplodon densirostris*) is one of the most sighted species of beaked whales, contrarily to the Azores where

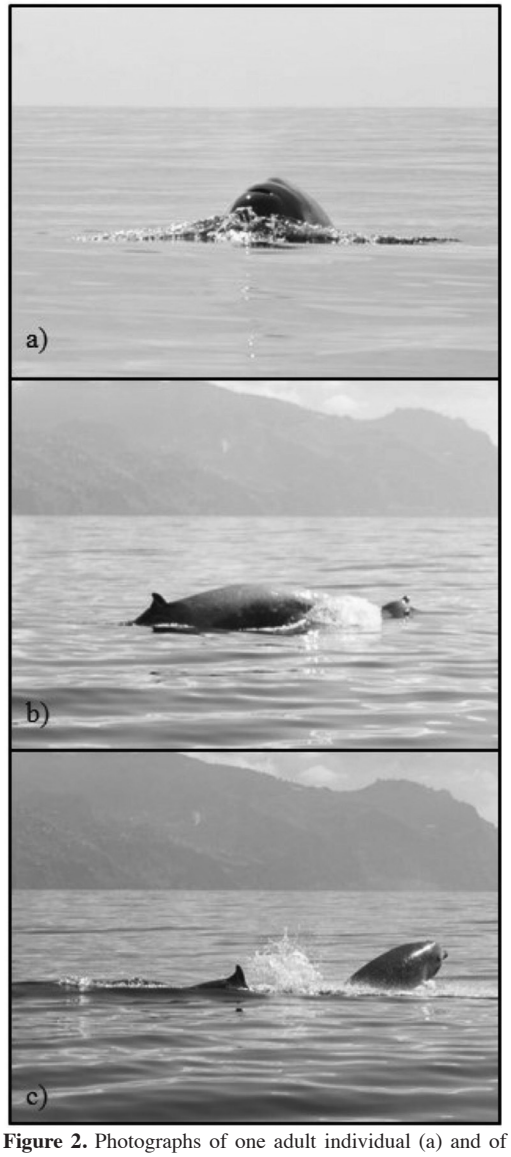

Figure 2. Photographs of one adult individual (a) and of an adult individual accompanied by a juvenile (b and c) sighted off Madeira Island (Photographs by Lobosonda, Madeira Whale Watching)

it is rare (Carrillo et al., 2010; Silva et al., 2014; Dinis et al., 2017b). Recently, the Azores and the Canary Islands have been described as possible hotspots for True's beaked whale (*Mesoplodon mirus*), which is not described in Madeira (Freitas et al., 2012; de Soto et al., 2017). Although these archipelagos share some common features, such as the lack of continental shelf and, therefore, deep waters close to the coast, there is a lack of knowledge regarding the distribution of beaked whales due to the few offshore cetacean surveys in Macaronesia (de Soto et al., 2017).

Although northern bottlenose whales are known for their curious behaviour towards boats, most of the existing knowledge for this species comes from analyses of individuals captured during whaling and from research on populations off eastern Canada (Whitehead & Hooker, 2012). In Madeira, previous sightings were of solitary animals or groups of up to three individuals, with no indication of age, sex, or behaviour (Freitas et al., 2012). The present sighting of five to seven individuals, with at least one juvenile, is in accordance with Whitehead & Hooker (2012), which described unstable groups of approximately one to ten individuals of mixed age and sex classes.

Nowadays, the northern bottlenose whales' main threats include interactions with fishing gear and ocean noise (Whitehead & Hooker, 2012). There are reports of whales removing the bait or catch off the lines in long-line fisheries, as well as of entanglement, in the northwest Atlantic (Department of Fisheries and Oceans Canada, 2009; COSEWIC, 2011). In Madeira, no such cases have been reported, but the pelagic long-line black scabbard fishery could pose a potential threat to this species and, thus, should be further investigated. Moreover, this family of deep-diving mammals appears to be the most susceptible to naval activities across the world (Evans & Miller, 2004). In Madeira, a stranding event of three Cuvier's beaked whales (*Ziphius cavirostris*) occurred in 2000. This was associated with NATO naval exercises in the area due to evidence found during necropsies (e.g., blood in and around the eyes, pleural haemorrhage, and lung congestion), as well as the coincidence in time between a rare mass stranding event and the occurrence of naval exercises in the area, which included surface vessels and submarines (Ketten, 2003; Freitas, 2004). The stranding of a northern bottlenose whale in the Canary Islands was also considered to be related to naval activities (Simmonds & Lopez-Jurado, 1991; Dinis et al., 2017a). The recent proposal for the establishment of a Natura 2000 Site of Community Importance in the waters surrounding Madeira, Desertas, and Porto Santo Islands, from 1.85 km off the coast out to 2,500 m of depth, will help to minimize any potential threat towards the populations of cetaceans using Madeiran waters on a regular or occasional basis.

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