



Stranding of two Blainville's beaked whales (*Mesoplodon densirostris*) in Ecuador

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Blainville's beaked whale (*Mesoplodon densirostris*), also known as the dense-beaked whale, occurs in temperate and tropical waters around the world including enclosed seas with deep water (Leatherwood and Reeves, 1982; Mead 1989; MacLeod *et al.* 2006; Jefferson, *et al.*, 2008). It is one of the most tropical species and has the most extensive distribution of the genus *Mesoplodon* (Mead 1989; MacLeod *et al.* 2006). The adult male Blainville's beaked whale is relatively easy to identify in the wild because the posterior half of the lower jaw is highly arched with two distinctive horn-like teeth that erupt and tilt slightly forward from this arched part (Leatherwood and Reeves, 1983; Jefferson *et al.*, 2008). Adult females have much less arched mandibles, and the teeth are much less developed and do not erupt (Moore, 1968; Besharse, 1971).

Even though Blainville's is among the best-known beaked whales and the most frequently identified at sea, some aspects related to its ecology, behavior and natural history still remain poorly known (see a recent review by Allen *et al.*, 2011). The species is classified as Data Deficient (DD) in the IUCN Red List (Taylor *et al.*, 2008). Only a handful of records exist for the species in the Southeast Pacific; most of them corresponding to sightings in oceanic waters off Colombia, Ecuador, Panamá and west of the Galápagos Islands (Merlen, 1995; Pitman and Lynn 2001; McLeod *et al.*, 2006). In addition, four stranded specimens have been reported from this region, including two from mainland Chile (Pastene *et al.*, 1990; Huckstadt, 2005), Easter Island (Aguayo *et al.*, 1998) and Isla del Coco, Costa Rica¹. In all cases, solitary stranded individuals were reported. Here we report the

¹Smithsonian National Museum of Natural History, Division of Marine Mammals database, Catalog # 12612; <http://collections.mnh.si.edu/search/mammals/>.

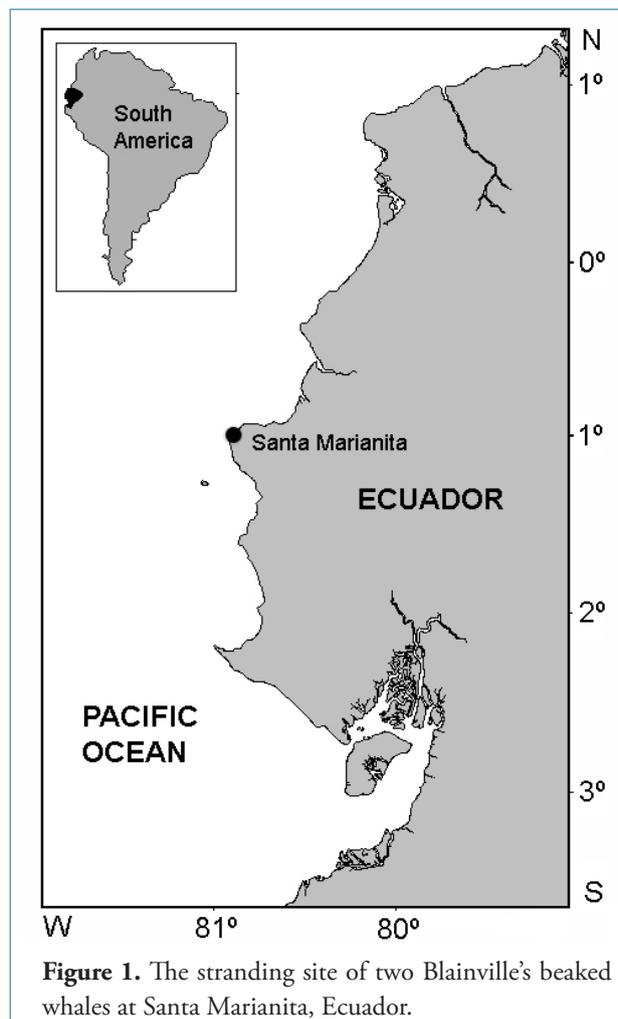


Figure 1. The stranding site of two Blainville's beaked whales at Santa Marianita, Ecuador.



Figure 2. Adult female Blainville's beaked whale on the beach. Note the oval scars along the body and the white patches around the throat and genital area (Photograph: NS).

stranding of a pair of Blainville's beaked whales in Ecuador based on photographs and skeletal remains available to the authors. This constitutes the first stranding of this species reported from mainland Ecuador and the fourth from the Southeast Pacific.

On 9 April 2008, two beaked whales stranded at Santa Marianita Beach (0°59.25'S, 80°51.05'W), a small fishing village located on the central coast of Ecuador (Figure 1). One of us (NS) was at the site the next morning when the carcasses were in good condition (Code 2 according to Geraci and Launsbury, 1993) and photographed the specimens. People from the village who witnessed the event informed us that despite their efforts to get the larger whale back into the water, the animal returned to the beach and died. Later, another, smaller whale beached itself 100m to the south on the same beach. Both whales were photographed on the beach; the larger whale was buried at the site using a bulldozer and the fate of the smaller whale was unrecorded.

The length of the larger whale was estimated to be between 4 and 4.5m and the smaller one was approximately 2.5m. We presume they were a mother and calf. They were not examined in detail, but a set of 10 photographs helped us to determine their external appearance at the time of the stranding. The photographs also allowed one of us (WB) to identify the species provisionally. They show an adult female on her left side partially buried in the sand (Figure 2). The animal was uniformly dark on the dorsum and flanks. The tip of the beak was white, as well as the lower jaws and throat. One ventral groove was visible on the white area of the throat on the right side; the left ventral groove was not visible but buried. Dark-colored skin continued from the throat down to the belly where the skin was missing due to beach abrasion; this area appeared reddish and scarred. A large white patch was present in the anal-genital area. The entire body was covered with healed whitish oval scars, usually attributed to the cookie cutter shark (*Isistius* spp.) (Jones, 1971; Mead, 1989). Some linear scars of different size were present in the

body surface on both the belly and flanks; the largest was estimated to be 40-45cm. One of the photographs clearly shows a pronounced arch in the middle of the lower jaw, a characteristic found in females of a few species of the genus *Mesoplodon* (see Figure 3).

The presumed calf was a female as well. The ventral side had a light coloration that contrasted with the dark flanks and dorsum, although it looked reddish due to abrasion. The most relevant features in the calf were three 15-20cm circular and deep wounds on the right side, two on the dorsum in front and behind the dorsal fin, and the third on the flank (Figure 4). This last one was so deep that the muscle was exposed. There was another wound on the head on the same side but not completely visible in the photographs. We presume sharks caused these wounds. Unlike the adult female, the calf did not show any visible oval scars on the body.

Three and a half years later (20 October 2011), we visited Santa Marianita in search of the whale remains to confirm the species. While there, we were able to talk to some of the people who were present at the stranding in 2008. They informed us that the remains were moved by the action of the waves some time before. However, some bones were collected by residents and were available to us for examination. Remains included the right mandible and seven vertebrae: three thoracic, two lumbar and two caudal. These are currently deposited in the Museo de Ballenas in Salinas, Ecuador (accession number OMEDE 01).

The mandible appeared worn along the upper edge and distal tip. Part of the mandible tip was missing, so we can only provide a minimum length. The bone below the condyle and around the mandibular fossa was damaged, but in general the mandible was in good condition. The mandible was 555mm in length and 116mm at its highest part (about two thirds of the way from the distal tip, 379mm) (Figure 5). The symphysis length was 85mm. A single alveolus of 39mm width was present and located at 2/3 from the



Figure 3. Right side of the head of the adult female partially buried in the sand. Note the pronounced mandibular arch (Photograph: NS).



Figure 4. Female calf Blainville's beaked whale with deep wounds in several parts of the body presumably caused by shark bites (Photographs: NS).

mandible condyle (369mm) and well behind the mandibular symphysis. The mandible was thicker at the symphysis level and rotated inward. The highest part of the mandibular arch was thinner and rotated outward, just behind the alveoli, giving the mandible a sinusoidal shape in the vertical plane.

The vertebrae were also worn mainly along the tips of the processes. The thoracic vertebrae had long spinous

processes and short transverse processes (length proportion 2.9:1 on average). The epiphyses were completely fused in thoracic and lumbar vertebrae, but absent in caudal vertebrae.

After reviewing the available literature on beaked whale distribution and biology, we concluded that the females of only two mesoplodont species occurring in the eastern



tropical Pacific, Blainville's beaked whale *M. densirostris* and the ginkgo-toothed beaked whale *M. ginkgodens*, have a pronounced mandibular arch such as found in the Ecuadorian specimen. We identified our specimen as *M. densirostris* based on the shape of the upper mandibular arch and the position of the alveolus, since the mandible is much higher and the alveolus is located in a more posterior position in *M. densirostris* than in *G. ginkgodens*. We defined these two particular differences in assessing the following material: two specimens in the collection of the National Museum of Natural History of the Smithsonian Institution available on-line through the Encyclopedia of Life² (Cat. N° 298237 and 504217, *M. ginkgodens* and *M. densirostris*, respectively), a drawing of *M. ginkgodens* in Mead (1989, Figure 15, referred to as unknown sex) and a photograph of a specimen of *M. densirostris* in Besharse (1973, Figure 7).

Regarding the position of the alveolus, Blainville's beaked whale has the most posterior position among the species of the genus *Mesoplodon* (Moore, 1968; Mead, 1989). According to Kasuya and Nishiwaki (1971), who examined two Blainville's beaked whale specimens from the Western Pacific, the symphysis length would be approximately 25% of the mandible length and the position of the alveolus around 40% of the total mandibular length from the tip. Moore (1968) also indicated that the distance from the mandible tip to the alveolus is about 300mm in adult animals in *M. densirostris*. In our specimen it is not possible to determine the exact location of the alveolus respect to the mandible length or the length of the symphysis because the tip is broken. However, based on the numbers provided by Kasuya and Nishiwaki (1971), we estimate that a section between 60 and 94mm of the mandibular tip is missing in the Ecuadorian specimen.

Beaked whales may strand alone or in groups but in most cases the primary cause remains a mystery, and this was no exception. One of the previous records from the Southeast Pacific was associated with fishing activities (Huckstadt,

²Available from http://eol.org/data_objects/19082119, 19082122, 19082442 and 19082444. Retrieved on 19 June 2012.

2005). In our case we discount fishing interaction because the animals did not show signs of entanglement or appendage mutilations. The photograph of the immature Blainville's beaked whale stranded at Easter Island reported by Aguayo *et al.* (1998) appeared to have a large shark bite on its belly. The circular bloody wounds on the calf body in the Ecuadorian specimen appeared to have been produced by shark bites as well, but we were unable to confirm this. In general, very little is known about predation upon beaked whales, but indirect evidence suggests that large sharks, killer whales (*Orcinus orca*) and false killer whales are potential predators (Mead, 1989; Allen *et al.* 2011).

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