

Mesoplodon bidens strandings- a short review.

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Abstract

Sowerby's beaked whale (*Mesoplodon bidens*) is endemic to the North Atlantic Ocean where it inhabits the off-shore coast associated with deep canyons. Its status remains poorly known but the number of strandings suggests it is the most frequently occurring species of the genus *Mesoplodon* in European waters. We summarize all stranding records available since 1825 using different resources.

INTRODUCTION

The Sowerby's beaked whale (*Mesoplodon bidens*), a member of the family Ziphiidae, lives only in the Atlantic Ocean. This species is the most commonly stranded species among mesoplodonts in Europe (241 records), compared to 26 True's (*Mesoplodon mirus*), 15 Gervais' (*Mesoplodon europaeus*), or 33 Blainville's (*Mesoplodon densirostris*) beaked whales (first author's unpublished stranding database accessed 31.12.2013). Sowerby's beaked whale strandings have been reported in several Atlantic Ocean countries, and recent records confirm its presence in the Baltic Sea (Aguayo- L. 1978, Kinze 1993). It is much rarer in the western North Atlantic with several sightings of pods and strandings in USA and Canada (Hooker and Baird 1999).

The use of stranding data to learn about the biology of the species involved should be approached carefully (Klinowska 1985). Despite this limitation, a long term stranding dataset can be a useful tool to improve our limited knowledge of rare and elusive species (MacLeod *et.al.* 2004) and in most cases, is the only information available on their history and biology.

This paper presents a summary of published and unpublished *Mesoplodon bidens* stranding records, including whales that were deliberately killed or entangled in nets.

MATERIALS AND METHODS

The stranding data were compiled from an exhaustive review of the scientific literature, personal communications and archives (mostly stranding networks), regional newspapers, as well as the World Wide Web. According to the first author's unpublished stranding database there are 265 stranding events of Sowerby's beaked whales (involving 304 animals) and at least 4 individuals were killed and 11 were incidentally caught in nets. This species is known from several mass strandings, involving 2 or more whales that were not cow-calf pairs: Madeira, Portugal (L. Freitas

pers.comm), Newfoundland and Labrador, Canada (Lien and Barry 1990), and with a majority of mass strandings in the Azores and in Scotland (RACA pers.comm., SAC pers.comm., this paper Figure 2). Confirmation of species identification was accomplished through comparison of 650 photos of previously identified Sowerby's beaked whales (first author's private collection).

SIGHTINGS AND STRANDINGS DISTRIBUTION

Although sighting records are scarce, a review shows that a higher number occur in the eastern Atlantic compared to the western Atlantic, which is supported by the stranding data presented in this paper. The sightings in the western North Atlantic are as follows: Hooker and Baird (1999) observed groups of Sowerby's beaked whale on four occasions in the Gully Canyon, (off eastern Canada) and Nova Scotia, in the Hydrographer Canyon (South New England, Marion *et.al.* 1987), an individual was found 50 miles directly south of Montauk Point, New York in 2006 <http://csiwhalesalive.org/newsletters/csi07213.html> and near George's Bank in 2007 <http://collections.mnh.si.edu/search/mammals>, in 2012 in Long Island, New York <http://oceanwanderersnews.blogspot.com/2012/06/sowerbys-beaked-whales-and-very-early.html>, and recently in Canada (T. Pusser pers. comm.).

In the eastern Atlantic, there is evidence of two sightings, one northwest of Scotland and the other west of the Orkney Islands as reported by De Buffrénil (1995), in 2012 between the Faroe Islands and Norway (Kristof Goemaere pers. comm.), the Faroe-Shetland Channel (Weir 1998), in Norway (Øynes 1974, Carlstroem *et.al.* 1997), off the Faroe Bank Channel to Iceland in 2012, Fort George, Scotland (Anonymous, 2009), Rockall Trough (Mackey *et.al.* 2003), Bay of Biscay (AMBAR unpublished sighting database), Azores (RACA pers.comm), in Italy (L. Bittau pers. comm.), and in the southern Mediterranean Sea off France (A. Gannier pers. comm.).

Strandings of Sowerby's beaked whale have been reported in 25 nations, protectorates, and territories (Table 1). The majority of stranding events occurred in Scotland ($n=73$ events, 79 individuals; 26.5% of total stranded individuals) followed by England ($n=36$ events, 37 individuals), France ($n=21$ events, 24 individuals), and the Netherlands ($n=20$ events, 21 individuals). The remaining countries had fewer than 15 stranding events recorded (Table 1). In Table 2 we present a subset of unpublished records (Figure 1).

DISCUSSION AND CONCLUSION

Beaked whales are often misidentified due to the difficulty of distinguishing species that are similar in external appearance. This challenge is particularly complicated when working with adult females and juveniles of both sexes, where key identifying characteristics are absent. Records of mesoplodont species should be reviewed carefully, with careful attention paid to this issue. Reviews of records of stranded animals have led to the revision of species identification in some cases. For example, a female mesoplodont recorded in Brazil in 1983 that was identified as a Blainville's beaked whale (Simoes-Lopes and Ximenez 1993), was recently confirmed as a Sowerby's beaked whale, becoming the most southern record of this species.

Rey and Cendrero (1980, 1981) reported three strandings of mesoplodonts on the northern Spanish coast. The individuals were a 610 cm male Sowerby's beaked whale, and a 601cm and 580 cm True's beaked whale (male and female, respectively). Since the maximum length of these two species recorded by FAO (Jefferson *et. al.* 1993) is 550 cm and slightly over 500 cm, respectively, we can hypothesize that these three stranded animals most likely are Cuvier's beaked whales (*Ziphius cavirostris*). Therefore, the male Sowerby's beaked whale (355 cm) that stranded in Basque Country (Getaria) is the first record of a Sowerby's beaked whale in Spain (Table 2; Figure 3). Recently two immature whales (female and male) that stranded in Galicia, Spain have been added to this list (A. Lopez. pers. comm.).

Based on the stranding frequency and locations, Sowerby's beaked whales are found almost exclusively in the colder waters of the North Atlantic, in both the western and eastern regions (Mead 1989; MacLeod *et al.* 2006). Of all the Atlantic species of *Mesoplodon*, this is the most northerly distributed, with most records north of 30°N. The distribution of dead animals centered in Scotland and the United Kingdom suggests that those waters are of high importance for this species (MacLeod *et al.* 2004). Other areas, such as the Mediterranean (France and Italy), where

sightings and strandings have been recorded, demonstrate that a seasonal migration, or maybe a small population living in the area, is plausible (L. Bittau pers. comm., A.Gannier pers.comm.).

Some threats to the species that have been identified include incidental or deliberate killing during targeted hunting of other cetacean species (Taylor *et al.* 2008), entanglements in fishing gear (e.g., driftnets) such as those along the east coast of the United States where 24 by-caught Sowerby's beaked whales were reported between 1989-1998 (Waring *et al.* 2001). Other threats that have been documented or predicted to impact this species include ingestion of plastic items (Scott *et al.* 2001), global climate change through alteration of the marine environment (Learmonth *et al.* 2006) and maritime traffic (Lucas and Hooker 2000). Loud anthropogenic sound such as that generated by military sonar and seismic exploration has been found to affect all deep-diving cetaceans such as beaked whales (D'Amico *et al.* 2009).

The lack of continuous and quality data makes it difficult to assess their abundance and distribution. Other features of this species, such as habitat, foraging, and migration patterns, remain a mystery. In addition, this species exclusively inhabits deep waters beyond the continental shelf edge (Taylor *et al.* 2008) in regions difficult to access due to weather conditions and/or cost of expeditions. These factors result in stranding records, and the collaboration between stranding networks, being a unique source of valuable life history data for this species.

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Table 1. Records of known worldwide Sowerby's beaked whale strandings 1800- 2013, listed by country.

Country	Number of stranding events	Total number of stranded individuals	comments	Source (pers.comm to BW)
Azores	14	23		RACA pers.comm, this paper fig.2
Belgium	5	7		De Smet 1966,1977
Brazil	1	1	incorrectly identified as Blainville's	Simoies-Lopes and Ximenez 1993
Canada	14	21	And 1 killed. 2 males stranded in 2013	Sergeant and Fisher 1957, W. Ledwell pers.comm, Lien <i>et.al</i> 2002, Ledwell <i>et.al.</i> 2005, COSEWIC 2006
Canary Islands	1	1		V. Martin pers.comm, Martin <i>et.al.</i> 2011
Denmark	9	9		Kinze 1993
Dominican Republic	1	1		This paper
England	36	37		R. Deaville pers.comm., Sheldrick 1989, Sheldrick <i>et.al.</i> 1995
Faroe Islands	8	9		B. Mikkelsen, D. Bloch pers.comm
France	21	24		Duguy 1973-1988, Dabin <i>et.al.</i> 2011
Germany	2	2		Kükenthal 1914, this paper
Iceland	5	5	And two killed in 1905 (ID uncertain)	S. Halldorsson pers.comm
Ireland	14	14		www.iwdg.ie
Italy	1	1	ID doubtful	Brunelli and Fasella 1929
Madeira	1	3	And one killed	L. Freitas pers.comm
Netherlands	20	21		C. Smeenk pers.comm. www.walvisstrandingen.nl
North Ireland	1	1		R. Deaville pers.comm
Norway	11	12		N. Øien pers.comm., Jongsard and Hoidal 1957, Collet 1912, this paper, fig.4

Poland (Germany)	1	1	450cm female stranded 8.9.1935 in Swietousc, Wolin Island. Skeleton in Zool. Mus.Un.Wroclaw. Skull in Universität Greifswald Zoologische Museum.	Koepcke 1936 Wurche 2005
Portugal	2	2		M. Sequeira pers.comm
Scotland	73	79		B. Reid, B. McGovern pers.comm., N. Davison pers.comm.
Spain	4	5		J. Bellido, A. Lopez pers.comm., Bellido <i>et.al.</i> 2008
Sweden	7	8		Lepiksaar 1966, this paper
USA	8	8	and 10 caught	http://collections.mnh.si.edu/search/mammals/ , Wenzel 2013
Wales	5	5		R. Penrose pers.comm.
TOTAL	265	304		

Table 2. Unpublished records of stranded Sowerby's beaked whales.(F: Female, M: Male, U: Unknown, n/a: non available data, * estimated length and # skeleton found).

TL(cm)	Sex	Date	Locality	Source
n/a		26.3.1825	Norðradalur, Streymoyar, Faroe Islands	B.Mikkelsen pers.comm
n/a		21.2.1921	Sørvágur, Suðuroyar, Faroe Islands	B.Mikkelsen pers.comm
n/a		1932	Eiði, Streymoyar, Faroe Islands	B.Mikkelsen pers.comm
n/a		27.1.1966	Sandvik, Suðuroyar, Faroe Islands	B.Mikkelsen pers.comm
n/a		27.1.1966	Sandvik, Suðuroyar, Faroe Islands	B.Mikkelsen pers.comm
n/a		8.5.1982	Vikarbyrgi, Suðuroyar, Faroe Islands	B.Mikkelsen pers.comm
480	M	28.3.1997	Sandvik, Suðuroyar, Faroe Islands	B.Mikkelsen pers.comm
454	M	3.2.2008	Hvalba, Suðuroyar, Faroe Islands	B.Mikkelsen pers.comm
490	F	28.4.2011	Sandur,Sandoy, Faroe Islands	B.Mikkelsen pers.comm
350*	U	15.8.1996	Îles de Lérins, Cannes, France	F.Dhermain pers.comm, Notarbartolo di Sciarra 2002
350*	U	15.8.1996	Îles de Lérins, Cannes, France	F.Dhermain pers.comm., Notarbartolo di Sciarra 2002
355	M	13.7.2006	Getaria, Gipuzkoa, Euskadi, Spain	This paper fig.3, Martin <i>et.al.</i> 2011
400*	U	2007	Bahía Rincón, Samaná, Dominican Republic	Exact locality uncertain; T.Mignucci pers.comm.
460	M	14.3.2007	Charleston Beach, Block Isl., Rhode Island, USA	Scott Comings pers.comm.
400*	F?	7.9.2009	Büsum, Dithmarschen, Schleswig-Holstein, Germany	http://www.focus.de/fotos/toter-schnabelwal-in-buesum_mid_527679.html

#	U	1.12.2010	Tjurpannan naturreservat, Grebbestad, Västra Götalands, Sweden	http://www.dykarna.nu/dyknyheter/udda-valfynd-i-bohuslan-1244.html
400*	F	15.11.2013	Tysvaer, Rogaland, Norway	Alf Tore Mjøs pers.comm fig.4

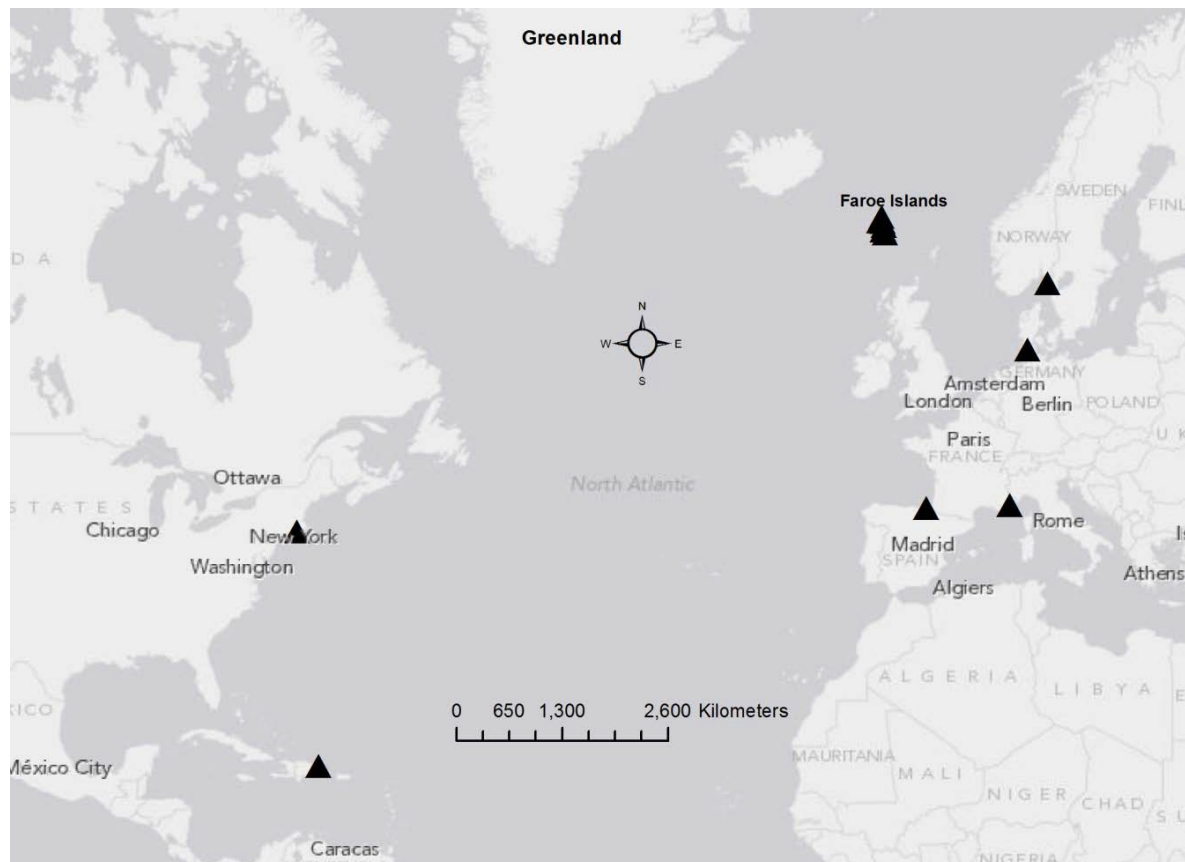


Figure 1. Map of a subset of *Mesoplodon bidens* strandings (black triangles) during 1825-2013 (records from Table 2). Each symbol represents a single individuals ($n=9$ in the Faroe Islands and $n=2$ in Cannes, France).



Figure 2. Three Sowerby's beaked whale retired from the mass stranding in Azores in 2009. Permission and copyright: Dr. Rui Prieto / ImagDOP 2009



Figure 3. A 355cm male stranded 13.7.2006 from Getaria, Basque Country. Photo: P. Cermeño



Figure 4. A 400cm female from Norway. Photo: Andreas Lund, courtesy Alf Tore Mjös, Museum Stavanger