

True's Beaked Whale, *Mesoplodon mirus*, in the North Atlantic Ocean: Distribution, Biology, Status and Threats**R. L. Brownell, Jr.¹, and B. M. Allen, and J. G. Mead³**¹NOAA Fisheries, SWFSC, Pacific Grove, California, USA,²NOAA Fisheries, NMML, Seattle, Washington, USA³Department of Mammals, Smithsonian Institution, Washington, D.C., USA

True's beaked whale, *Mesoplodon mirus*, was described by True in 1913, hence the common name. The holotype is based on a female collected on 26 July 1912 from Bird Island Shoal. Beaufort Harbor, North Carolina, USA. The specimen was reported to be an adult female with a total length of 16 ft. The next paper on this species was not published until over thirty years had passed from its original description. It summarized all known records of *Mesoplodon* from North America, including six *M. mirus* (Ulmer 1941). Fifty years after its description, this species was still only known from twelve specimens, including four from the European side of the North Atlantic Ocean (Moore 1966), mainly in cold-temperate waters. This is the only species of *Mesoplodon* with an anti-tropical distribution and with most of the Southern Hemisphere records from the South Atlantic (Mead *et al.* 1988 and Mead 1989). It was first reported in the Southern Hemisphere from a stranding in 1959 by McCann and Talbot (1963).

In this account we will only discuss the North Atlantic Ocean populations, except for some information on the biology of the species. This species has rarely been recorded at sea (Tove 1995, Weir *et al.*, 2004), and therefore most of our knowledge on it is from stranded specimens.

DISTRIBUTION

Range –This species has an unusual distribution in that it is found on both sides of the North Atlantic, Australia and South Africa. Based on available strandings and sightings, it is the only ziphiid with a true anti-tropical distribution. North Atlantic records of this species are mainly from warm-temperate waters. Along the western North Atlantic, the southernmost records of these whales are from Flager Beach, Florida (Moore and Wood 1957) and San Salvador, Bahamas (Anon. 1981). The northernmost record is Saint Ann's Bay, Nova Scotia (Allen 1939). More recently, this species has also stranded in Bermuda (MacLeod 2000). In the eastern North Atlantic, specimens are known from Hebrides Islands, Scotland (Fraser 1934- misidentified as *Ziphius* Herman 1992), west coast, Ireland (Anderson 1901), Bidart, France (Barriety 1962), Islas Canarias (Vonk and Martin 1988)

and the Azores (Steiner *et al.*, 1998). Sightings of True's beaked whales are known from the Bay of Biscay (Weir *et al.*, 2004). No records of True's beaked whale have been recorded in the Gulf of Mexico, the Caribbean, the Mediterranean Sea or farther south in the eastern North Atlantic Ocean (MacLeod *et al.*, 2006).

Known records – Only 22 records were reported from the North Atlantic, including six from the eastern side (Mead 1989). Other new records since the late 1980s include: Bermuda (MacLeod 2000), Ireland (Berrow and Rogan 1997), and the Canaries (Vonk and Martin 1988). The total number of specimens/records from the Northern Hemisphere is only about 50, so little is known about the biology of this species.

BIOLOGY

Size and Reproduction – The largest male in a sample of 16 specimens was 5.35 m long and next largest was 4.85 m (Mead 1984). The largest female was 5.1 m long (n=12). The largest? recorded fetus was 2.185 m long and the smallest calf was 2.325 m long (Ross 1984?). The estimated length at birth is 2.2 m (Ross 1984). A 2.4 m calf had a partly healed umbilicus (Best 2007). The weight of the largest single ovary was 49 g (Mead 1984). Mead (1989) reported that the gonads of sexually mature male *Mesoplodon* spp. ranged from 140 to 250 g.

Population structure – True's beaked whales from the North Atlantic should be considered a separate management population from those found in the Southern Hemisphere. Museum specimens from the two regions should be examined for possible morphological and genetic differences. Off Madagascar, this species has been observed with snowy white flukes and tail stocks that are sharply delineated from the anterior body (R. L. Pitman, pers. com. 1 April 2004). The coloration of Southern Hemisphere True's beaked whales is illustrated in Baker (1983) and Ross (1984). This coloration is different from that of specimens of *M. mirus* from the North Atlantic, which do not have this white pigmented region. These color differences suggest that the two populations may be possible sibling species, as was discovered with the Hector's beaked whales. The two True's beaked whales used in the phylogenetic relationship of beaked whales in Gales *et al.* (2002) were both from the Northern Hemisphere.

Food habits – Unidentified squid beaks have been reported from the stomach of this species (Mead 1989). The IUCN Red List Species Account reported -- "Stable isotope analysis has found that this species feeds at a similar trophic level to other *Mesoplodon* species with which it is sympatric, but at lower trophic level than

Cuvier's beaked whale and the northern bottlenose whales which suggests that it feeds on smaller prey than these latter species (MacLeod et al., 2003)."

STATUS

Abundance Estimates – The best abundance estimate for beaked whales in the western North Atlantic off the northeast coast of the United States is 2,839 (CV = 0.578). This undifferentiated beaked whale abundance estimates includes *Ziphius* and all species of *Mesoplodon* spp. in the survey area.

Under the IUCN Red List the status of this species is listed as Data Deficient. The justification for this (Talyor *et al.*, 2008) is that "There is no information on global abundance or trends in abundance for this species. It is not believed to be uncommon but it is potentially vulnerable to low-level threats and a 30% global reduction over three generations cannot be ruled out (criterion A)."

THREATS

Human-related mortality – During the 1990s, this species was identified in the bycatch of the pelagic drift gillnet fishery along the eastern coast of the United States. This fishery concentrated effort off the southern edge of the Georges Bank and off Cape Hatteras (Waring *et al.* 2002) and was closed after 1996. Beaked whale bycatch occurred between July and October from Georges Canyon to Hydrographer Canyon (Northridge 1996). Forty-six beaked whale mortalities, including four True's beaked whales were recorded between 1989 and 1998 (NOAA 2009). In 2003, one unidentified beaked whale was reported to be seriously injured in the U.S. Atlantic pelagic longline fishery (NOAA 2009).

Between 1992 and 2002, 69 beaked whales, including three True's beaked whales were reported stranded along the Atlantic coast of the United States from Florida to Massachusetts (NOAA 2009). One stranded True's beaked whale out of four that stranded between 2003 and 2007 on the Atlantic coast of the United States was classified as a fisheries interaction (NOAA 2009).

In the eastern North Atlantic, True's beaked whales may be taken in albacore tuna driftnet fishery operated by various European countries which has taken at least eight species of small cetaceans.

Beaked whales, like other toothed cetaceans, use sound to feed, communicate and navigate in their habitat. Cox *et al.* (2006) noted that beaked whales are likely vulnerable to loud anthropogenic sounds, such as those generated by navy sonar and seismic exploration. However, to date no True's beaked whales have been associated with any of

the unusual mass stranding events associated with naval sonar exercises (Brownell *et al.* data).

One stranded specimen from Bethany Beach, Delaware had a plastic bag in its stomach. According to the Red List Species Account -- “Evidence from stranded individuals of *Mesoplodon mirus* indicates that they have swallowed discarded plastic items. This may eventually lead to death (e.g. Scott *et al.* 2001).” Pieces of plastic debris were also reported in a stranded specimen of *M mirus* from Brazil (Souza *et al.*, 2005).

Parasites – Barnacles, *Conchoderma* sp. And whale lice, *Platycyamus* n. sp. (Best 2007) *Xenobalanus* sp. Best 2007 and Ross 1984) *Penella* on whale from Brazil (Souza *et al.*, 2005). Bites from cookie-cutter sharks, *Isistius*, have been recorded (Souza *et al.*, 2005). Nematodes, *Anisakis* sp. Have been recorded in the stomach of a stranded specimen from Brazil (Souza *et al.*, 2005).

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