

Beaked Whales Stranding Records from the Mexican Caribbean and Gulf of Mexico

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Beaked whales are a group of odontocetes characterized by reduced dentition, and the diet of most species is dominated by mesopelagic or bathypelagic squid and fish (Folkens et al., 2002). The Family Ziphiidae includes 22 species, which are grouped into six genera that are recognized worldwide (Mead, 2009; Carroll et al., 2021). Their pelagic habits, long dives, and little time at the surface make it difficult to find and study them. In addition, these whales do not form large groups, and interaction with humans is scarce. Therefore, beaked whales are identified as rare; for many species, few details are available about their presence, distribution, biology, and ecology.

Herein, we present all historical records of beaked whales in the Mexican Caribbean and Gulf of Mexico. The study area included six Mexican states: (1) Tamaulipas, (2) Veracruz, (3) Tabasco, (4) Campeche, (5) the Yucatán in the Gulf of Mexico, and (6) Quintana Roo in the Caribbean Sea. We conducted an exhaustive search of beaked whale sightings and stranding records in peer-reviewed journals; databases; books; theses; news reports; technical reports from universities, the government, and scientific collections; as well as databases from one of the authors (W. Bachara), the Yucatan Marine Mammal Research and Conservation Program (PICMMY-UADY in Spanish), and the Mexican Caribbean Marine Mammal Stranding Network (RVMMCM in Spanish).

A total of 22 confirmed records (from 1974 to 2022) were obtained for 23 stranded beaked whales (Figure 1; Table 1). The highest number of records was for the Gulf of Mexico ($n = 14$) followed by Quintana Roo ($n = 8$). Records included four beaked whale species: (1) Cuvier's beaked whale (*Ziphius cavirostris*), (2) Blainville's beaked whale (*Mesoplodon densirostris*), (3) Gervais' beaked whale (*Mesoplodon europaeus*), and (4) Sowerby's

beaked whale (*Mesoplodon bidens*). The species most represented was the Gervais' beaked whale ($n = 12$ individuals).

Cuvier's beaked whale (Cuvier, 1823)—This species was reported in the Gulf of Mexico and Caribbean Sea with seven records in three different Mexican states (Veracruz, Yucatán, and Quintana Roo) (Figure 2a). These records date between 1974 to 2021. The first for the species in the Mexican Caribbean was in 1974, and the first for the Mexican Gulf of Mexico was in 2004. Würsig et al.

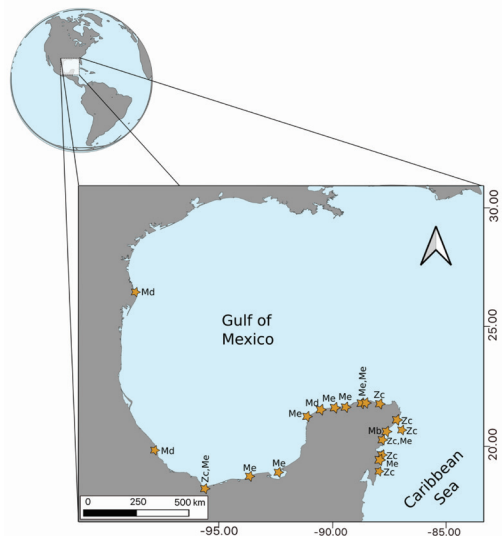


Figure 1. Stranding records of beaked whales in the Mexican Gulf of Mexico and Caribbean Sea. Stars show the stranding location for each individual. Zc = *Ziphius cavirostris*, Me = *Mesoplodon europaeus*, and Md = *Mesoplodon densirostris*.

Table 1. Beaked whale stranding records in the Mexican Gulf of Mexico and Caribbean Sea. *Sources:* a = Aguayo et al., 1988; b = Niño-Torres et al., 2015; c = Gallo-Reynoso & Pimienta, 1989; d = Solís-Ramírez, 1995; and e = Díaz-Gamboa et al., 2022.

Species	Number of individuals	Sex	Length (cm)	Date (d/m/y)	Locality	Region	First record
<i>Ziphius cavirostris</i>	1	--	--	21/6/1974	Tulum, Quintana Roo	Caribbean	Mexican Caribbean
	1	--	--	15/12/1986 a	Puerto Morelos, Quintana Roo	Caribbean	
	1	--	--	14/6/2004	El Cuyo, Yucatán	Gulf of Mexico	Mexican Gulf of Mexico
	1	M	--	21/3/2011 b	Mahahual, Quintana Roo	Caribbean	
	1	--	600	5/4/2013	Cozumel, Quintana Roo	Caribbean	
	1	--	--	1/10/2014	Coatzacoalcos, Veracruz	Gulf of Mexico	
	1	M	520	24/4/2021	Sian Ka'an, Quintana Roo	Caribbean	
<i>Mesoplodon densirostris</i>	1	M	400	21/3/1999	Sisal, Yucatán	Gulf of Mexico	México & Mexican Gulf of Mexico
	1	F	400	18/8/2010	Matamoros, Tamaulipas	Gulf of Mexico	
	1	--	300	27/10/2020	Playa de Juan Angel, Veracruz	Gulf of Mexico	
<i>Mesoplodon europaeus</i>	1	--	--	12/5/1986 c	Isla Aguada, Campeche	Gulf of Mexico	México & Mexican Gulf of Mexico
	1	--	318	26/1/1995 d	Chelem, Yucatán	Gulf of Mexico	
	1	M	260	6/7/1999	Celestún, Yucatán	Gulf of Mexico	
	1	M	421	29/7/2009	Telchac Puerto, Yucatán	Gulf of Mexico	
	2	M/F	--	4/5/2010 b	Bahía Ascension, Quintana Roo	Caribbean	Mexican Caribbean Sea
	1	M	425	5/7/2010 b	Paraiso, Tabasco	Gulf of Mexico	
	1	--	440	7/7/2011	Río Lagartos, Yucatán	Gulf of Mexico	
	1	M	392	11/3/2013 b	Tulum, Quintana Roo	Caribbean	
	1	F	460	26/7/2015	Las Coloradas, Yucatán	Gulf of Mexico	
	1	--	--	5/12/2019	Coatzacoalcos, Veracruz	Gulf of Mexico	
	1	F	470	5/8/2022	Coatzacoalcos, Veracruz	Gulf of Mexico	
<i>Mesoplodon bidens</i>	1	M	530	13/6/2018 e	Playa del Carmen, Quintana Roo	Caribbean	México & Mexican Caribbean Sea

(2000) reported 18 strandings and 14 sightings of this species in the U.S. Gulf of Mexico.

Blainville's beaked whale (Blainville, 1817)—This species was observed only in the Gulf of Mexico, with three records in three different Mexican states (Tamaulipas, Veracruz, and Yucatán) (Figure 2b) dating from 1999 to 2010.

The 1999 record was the first for the species in México. Würsig et al. (2000) reported four strandings and two sightings of this species in the U.S. Gulf of Mexico.

Gervais' beaked whale (Gervais, 1855)—This species was documented in the Gulf of Mexico and Caribbean Sea with 11 records (12 individuals)



Figure 2. (a) Cuvier's beaked whale (*Ziphius cavirostris*) in Mahahual, Quintana Roo, México, in 2011; (b) Blainville's beaked whale (*Mesoplodon densirostris*) in Sisal, Yucatán, México, in 1999; and (c) Gervais' beaked whale (*Mesoplodon europaeus*) in Las Coloradas, Yucatán, México, in 2015. (Photo credits: All pictures were taken by REDG team from the Departamento de Biología Marina, Universidad Autónoma de Yucatán)

in five different Mexican states (Veracruz, Tabasco, Campeche, Yucatán, and Quintana Roo) (Figure 2c). These records date from 1986 to 2022, with 1986 the first for the species in México and the Mexican Gulf of Mexico and 2010 for the Mexican Caribbean Sea. Würsig et al. (2000) reported 11 strandings of this species in the U.S. Gulf of Mexico and four in northwestern Cuba.

Sowerby's beaked whale (Sowerby, 1804)—This species was observed only once in 2018 near Quintana Roo, which is considered extralimital of its usual North Atlantic Ocean range (Díaz-Gamboa et al., 2022). There is only one stranding record reported of this species in the U.S. Gulf of Mexico (Bonde & O'Shea, 1989).

This summary of beaked whale records offers a quick view about the number of beaked whale species observed in the Gulf of Mexico and Caribbean Sea near Mexican shores. It also highlights the need to develop future studies of these species to update information about their distribution and abundance, especially in this zone marked by an extensive petroleum industry.

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