

Evaluating the isotopic niche of beaked whales from the southwestern South Atlantic and Southern Oceans

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†In loving memory of R. Natalie P. Goodall

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Table S1. General information of eight species of beaked whales recorded in Tierra del Fuego (Argentina). PhM = physical maturity. In parentheses, number of specimen classified as 1: juvenile, 2: subadult, 3: adult based on their physical maturity (Goodall et al. 1988, 2008). TP = trophic position estimated by gut contents (Pauly et al. 1998). *nd* = no data available. Data sourced from: Bastida & Rodriguez (2009), Clark & Goodall (1994), Friedlaender et al. (2010), Goodall et al. (2008), Groom et al. (2014), MacLeod and D’Amico (2006), MacLeod et al. (2003), Otley et al. (2012), Pauly et al. (1998), Santora and Brown (2010), Sekiguchi et al. (1996), Van Warebeek et al. (2010).

Scientific name	Common name	PhM*	General distribution	Latitude (°S)	Water temperature	Diet	TP
<i>Berardius arnuxii</i>	Arnoux's beaked whale	<i>nd</i>	<i>mainly polar</i>	~40° to Antarctic pack-ice	cold waters	squids	4.1
<i>Hyperoodon planifrons</i>	Southern bottlenose whale	3 (11)	<i>mainly polar</i>	~30° to Antarctic pack-ice	cold waters	squids >> fish	4.1
<i>Mesoplodon bowdoini</i>	Andrew's beaked whale	3 (1)	<i>subantarctic</i>	32° to 55°	cold-temperate waters	<i>nd</i>	<i>nd</i>
<i>Mesoplodon grayi</i>	Gray's beaked whale	1 (1), 3 (6)	<i>subtropical/subantarctic</i>	30° to 55°	cold-temperate waters	fish >> squids	<i>nd</i>
<i>Mesoplodon hectori</i>	Hector's beaked whale	1 (1)	<i>subantarctic</i>	32° to 55°	cold-temperate waters	squids ~ fish	4.4
<i>Mesoplodon layardii</i>	Layard's beaked whale	1 (2), 3(7)	<i>subantarctic</i>	33° to 60°	cold-temperate waters	squids >> fish > crustaceans	4.4
<i>Tasmacetus shepherdi</i>	Shepherd's beaked whale	3 (1)	<i>subtropical/subantarctic</i>	33° to 54°	cold-temperate waters	fish >> squids	<i>nd</i>
<i>Ziphius cavirostris</i>	Cuvier's beaked whale	1 (4), 2 (1), 3 (4)	<i>widely distributed (subtropical/subantarctic)</i>	0° to 64°	cold-temperate waters	squids >> fish > crustaceans	4.3

*Physical maturity was assessed by the state of epiphyseal fusion of the vertebra: where 0 = fetus or neonate (n = 0), with at least some neural spines unfused to the centra; 1 = juvenile (n = 8 individuals), all neural spines unfused but epiphyses unfused to the centra; 2 = subadults (n = 1 individual), some or nearly all of the epiphyses fused; and 3 = adult (n = 31 individuals), all epiphyses fused (Goodall et al. 1988, 2008).

LITERATURE CITED

- Bastida R, Rodriguez D (2009) Marine mammals of Patagonia and Antarctica, 2nd edn. Vázquez Mazzini Editores, Buenos Aires
- Clark M, Goodall RNP (1994) Cephalopods in the diets of three odontocete cetacean species stranded at Tierra del Fuego, *Globicephala melaena* (Traill, 1809), *Hyperoodon planifrons* Flower, 1882 and *Cephalorhynchus commersonii* (Lacepede, 1804). *Antarct Sci* 6:149-154
- Friedlaender AS, Nowacek DJ, Johnston DW, Read AJ, Tyson RB, Peavey L (2010) Multiple sightings of large groups of Arnoux's beaked whales (*Berardius arnouxii*) in the Gerlache Strait, Antarctica. *Mar Mamm Sci* 26:226-233
- Goodall RNP, Galeazzi AR, Lichter AA (1988) Exploitation of small cetaceans off Argentina 1979-1986. *Re Int Whaling Comm* 38:407-410
- Goodall RNP, Benegas LG, Boy CC, Dellabianca N, Pimper L, Riccialdelli L (2008) Review of small cetaceans stranded or incidentally captured on the coast of Tierra del Fuego, Argentina, over 33 years. *Sci Comm Doc SC/60/SM21*. International Whaling Commission, Cambridge
- Groom C, Coughran DK, Smith HC (2014) Records of beaked whales (family Ziphiidae) in Western Australian waters. *Mar Biodivers Rec* 7:e50
- MacLeod CD, D'Amico A (2006) A review of beaked whale behavior and ecology in relation to assessing and mitigating impacts of anthropogenic noise. *J Cetacean Res Manag* 7:211-221
- MacLeod CD, Santos MB, Pierce GJ (2003) Review of data on diets of beaked whales: evidence of niche separation and geographic segregation. *J Mar Biol Assoc UK* 83:651-665
- Otley H, Smith J, Dalebout ML (2012) Beaked whale strandings on the Falkland Islands and South Georgia, South Atlantic Ocean, between 1866 and 2008. *J Mar Biol Assoc UK* 92:1851-1864
- Pauly D, Trites AW, Capuli E, Christensen V (1998) Diet composition and trophic levels of marine mammals. *J Mar Sci* 55:467-481
- Santora JA, Brown ET (2010) Spatial distribution patterns of southern bottlenose whales, *Hyperoodon planifrons*, near the South Shetland Islands, Antarctica. *Mar Mamm Sci* 26:960-968
- Sekiguchi K, Klages NTW, Best PB (1996) The diet of strap-toothed whales (*Mesoplodon layardii*). *J Zool (Lond)* 239:453-463
- Van Waerebeek K, Leaper R, Baker AN, Papastavrou V and others (2010) Odontocetes of the Southern Ocean Sanctuary. *J Cetacean Res Manag* 11:315-346