

Ziphius cavirostris strandings-a short review.

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Abstract

Cuvier's beaked whale (*Ziphius cavirostris*) is a member of the family Ziphiidae and has been recorded from all oceans. This paper summarizes all stranding records that the first author has collected since 1995.

Introduction

Among 4563 Ziphiidae stranding records in this compilation (accessed 31.12.2012), *Ziphius cavirostris* was the most common stranded ziphiid species (1473 records–1658 animals) compared with the more common mesoplodonts (Gray's– *Mesoplodon grayi*, Blainville's– *Mesoplodon densirostris*, Layard's– *mesoplodon layardii*, Stejneger's– *Mesoplodon stejnegeri*, Sowerby's– *Mesoplodon bidens*, Gervais'– *Mesoplodon europaeus* 480, 289, 290, 285, 268, 263 records – respectively) or northern bottlenose whale (*Hyperoodon ampullatus*), 285 records.

This paper presents a summary of all known *Ziphius* stranding records, including some of whales caught in nets. The stranding information is compiled from the scientific literature, personal communications and archives (stranding networks), regional newspapers, and the World Wide Web.

Calf strandings

The number of confirmed recorded strandings of Cuvier's calves is 34 worldwide. In Table 1, records of 24 strandings for which data could be presented are listed. Known minimal calf length at birth is 270cm (Heyning and Mead, 2009). Lengths ranged from 181 to 269 cm (mean = 235.0; \pm 23.0). Mean length (\pm SD) of stranded male ($n=8$) and female ($n=8$) calves was 225.6 (\pm 26.3) and 248.2 (\pm 14.9), respectively (Fig. 1). An interesting finding of note is that some whales at 270cm length still had fetal folds (BW, unpubl. data). Eighteen (81%) of the stranded calves were reported in the North Atlantic, or in adjacent waters, while 13 (62%) occurred around the European coastline and Algeria. Most of the calf strandings occurred between March and September, with a suggestion of a bi-modal distribution (March and July) of strandings (Fig. 2).

Table 1. Records of stranded Cuvier's beaked whale calves*

Sex	Length	date	Locality	State/Province	Country	Source		
F	181	14-05-1985	Santoña	Cantabria	Spain	Garcia-Castrillo and Cendrero	1987	Stranded with her mother 566cm
F	200	13-06-1973	L'Estartit, Baix Empordà, Girona	Cataluña	Spain	Casinos and Filella	1975	
U	200 _{est}	28-03-1990	Moniello, Gozon	Asturias	Spain	Garcia-Castrillo et al.	1991	
F	210 _{est}	26-08-1992	Mortelle, Messina	Sicilia	Italy	CSC**	1995	
F	218	20-04-1964	Pra, Genova	Liguria	Italy	Cagnolaro	1965	

M	225	26-03-2010	Plage Keller,Cap d'Antibes	Alpes-Maritimes	France	Dupraz	2010	pers.comm
F	228	29-05-1996	58th Str.,Long Beach,Brunswick	North Carolina	USA	Smithsonian	2010	
M	229	13-07-2012	Pointe des Châteaux	île de Grande-Terre	Guadeloupe	OMMAG	2012	pers.comm
F	234	26-04-1989	Parangipettai	Tamil Nadu	India	Karupiahh et.al.	2001	Caught in fishing nets
M	235	11-1998	Icarai,Caucaia	Ceará	Brazil	Meirelles	2009	pers.comm
U	240	31-07-2008	Johanna Beach,Cape Otway	VIC	Australia	http://museumvictoria.com.au/about/mv-news/2008/rare-whale-retrieved	2008	
F	242	11-03-1979	Lege	Gironde	France	Duguy	1981	
M	247	15-06-1980	Plouhinec	Finistère	France	Duguy	1981	
M	249	29-07-1980	Merritt Isl.,Brevard	Florida	USA	www.flmnh.ufl.edu/scripts/DBs/mammals_pub.asp	2008	
M	250	23-09-1987	Plage Corales,Oran	Oran	Algeria	Boutiba	1994	
U	250	13-04-1994	Bocale	Calabria	Italy	CSC**	1996	
U	250	23-07-2001		Oran	Algeria	Boutiba	2002	
F	252	18-08-1996	Enfola,Portoferraio,Elba	Toscana	Italy	CSC**	1997	
M	253	12-03-1995	Llanes	Asturias	Spain	Lopez et.al.	1996	
M	258	27-01-1986	Rt.712,Seaford,Bay Tree Pt.,York	Virginia	USA	Smithsonian	2007	
U	259	19-06-1990	S Beach,Point Reyes National Seashore,Marin	California	USA	http://arctos.database.museum	2002	
F	265	15-03-1983	Trincomalee	Eastern	Sri Lanka	Leatherwood and Reeves	1989	
M	267	22-09-1963	Oiso	Kanagawa	Japan	Nakajima	1995	
M	269	04-04-1978	False Cape, Virginia Beach	Virginia	USA	Smithsonian	2002	

*author has 34 such cases ** <http://www.centrostudicetacei.it> Rendiconto 1992,1993,1995

Fig. 1 – Frequency distribution of length (cm) by sex for stranded Cuvier’s beaked whale calves.

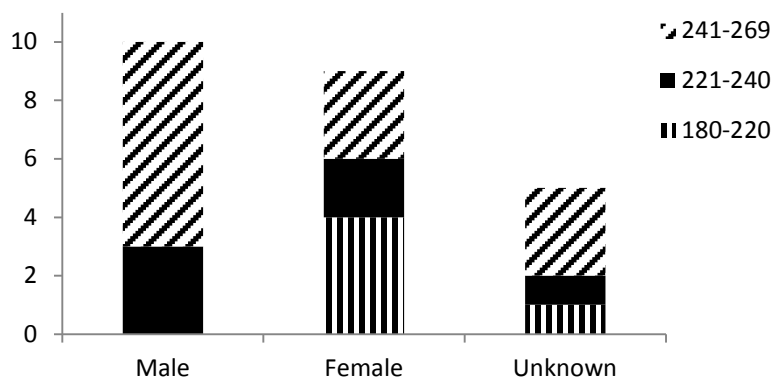
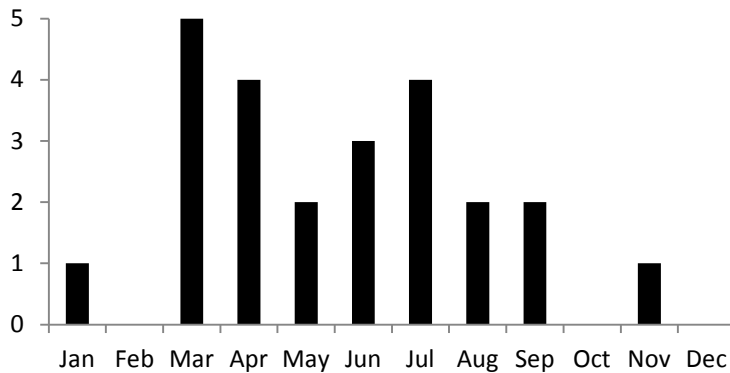


Fig. 2 – Monthly distribution of stranded Cuvier’s beaked whale calves.



Distribution of strandings

Cuvier's beaked whale is the most cosmopolitan of the beaked whales and is found in all oceans except in the high polar waters (Heyning and Mead, 2009). Most of the distribution information is based on stranding records. In Table 2, we present a summary of all strandings. Strandings of Cuvier’s have been reported in 105 nations, protectorates, and territories. Locations for which the total number of individuals stranded is very high (i.e., greater than 50 total individuals) include the Canary Islands, France, Greece, Italy, Japan, New Zealand, Scotland, Spain, and the United States.

Table 2. Records of known worldwide Cuvier’s beaked whale strandings 1803-2012, listed by country.

	Number of stranding events	Total number of stranded individuals	comments	Source(pers.comm to BW)
Azores	8(9)	8(9)		RACA pers.comm
Albania	1	1		Lamani et.al.1976
Algeria	12	14		Boutiba 1994,1996 Boutiba et.al. 2001
American Samoa	2	2		Smithsonian database
Argentina	33	33	recent strandings between 8 and 10.2012 in Rio Negro,Chubut and Santa Cruz.	Goodall 1978,Goodall et.al. 2008,Lichter 1986,Hevia 2011,author’s unpub.datab.
Aruba	1	1	Barros and Debrot 2006 report another stranding “ziphius cavirostris?” at Baby Beach 30.3.2003. The animal is now re-identified as a sperm whale- A.Henriquez pers.comm	Agudo and Ponson 1996
Australia	45	46		Ross et.al.1988, Paterson and van Dyck 1990, Chatto and Warneke 2002, http://data.aad.gov.au/aadc/whales Dixon and Frigo 1994,Guiler 1978, author’s unpub.datab..
Bahamas	17	21		http://www.bahamaswhales.org
Barbados	5	5		Rosario-Delestre et.al.
Belgium	1	1		Van Waerebeek et.al. 1997
Bermuda	3	3		Smithsonian database

Bonaire	3	6		Rosario-Delestre et.al.
Brazil	35	35		Carvalho 1969,Pinedo et.al. 2001, Zanellato et.al. 1995, Medeiros 2006, Silva-Ribeiro and Soto 2000,Guedes Batista et.al. 2012,Pansard et.al. 2005, Oliveira and Soto 2010,Pereira Mayorga et.al. 2010,Nascimento et.al. 2010,C.Meirelles pers.comm, author's unpub.database
British Virgin Islands	1	3		Rosario-Delestre et.al.
Canada	20	20		Cowan 1952,Cowan and Hatter 1940,Pike 1969,Mitchell 1968,Willis and Baird 1998,author's unpub.datab.
Canary Islands	62	67		V.Martin pers.comm.M.Carrillo pers.comm
Cayman Islands	1	1		Rosario-Delestre et.al.
Chile	7	7		Dalebout et.al.2005,Brito and Reyes 1990,Cardenas et.al. 1991,Sanino et.al. 1996
China	2	2	521cm female (5.6.2007) and 400-450cm unknown sex(2010)-both identified incorrectly as <i>Mesoplodon ginkgodens</i> . 1 dead in fishing nets.	Wang et.al. 2010,Liu et.al.2009 author's unpublished database
Colombia	4	4	And 1 floated	Vidal 1990,Prieto Rodriguez 1988,Smithsonian
Comoros	1	1		Robineau 1975
Cook Islands	5	6		http://www.whaleresearch.org
Costa Rica	4	4		author's unpublished database,Rodríguez-Fonseca 2012
Croatia	5	5		Hirtz 1940,Holcer et.al.2007,Gomercic et.al.2006
Cuba	17	32	14 whales stranded in 1986	Blanco 2011
Curaçao	2	2		Van Bree et.al.1973,Debrot et.al. 1998
Cyprus	2	2	Recent stranding 6.2012 in Limassol	author's unpublished database
Dominican Republic	4	4		Rosario-Delestre et.al., author's unpub.datab.
Ecuador(with Galapagos)	16	24		Palacios et.al. 2004, Chiluita et.al. 1998 Felix et.al. 2011 D.Palacios pers.comm,F.Felix pers.comm
Egypt	1	1		Marchessaux 1980
England	9	9		R.Deaville pers.comm
Falklands	4	4		Otley et.al. 2011
Faroe Islands	1	1		B.Mikkelsen pers.comm
Fed. States Micronesia	2	2	adult male stranded in 2010	Smithsonian database,author's unpub.datab.
France	103	104		F.Dhermain pers.comm,F.Dupraz pers.comm Duguy 1971-1990,Dabin et.al.2011, http://crrm.univ-lr.fr Paulus 1962,author's unpub.datab.
French Polynesia	4	4		P.Carzon pers.comm.Reeves et.al.1999
Ghana	0	0	1 dead in nets	Van Waerebeek et.al. 2009

Greece	56	88		A.Frantzis pers.comm.,Podesta et.al.2006
Guadeloupe	4	4	Calf stranded 07.2012	Rinaldi et.al.2006, OMMAG pers.comm.
Guam	2	2		author's unpublished database & D.Schofield pers.comm
Hawaii	11	12		D.Schofield pers.comm
Honduras	1	2		Smithsonian
Iceland	7	7		S.Halldorsson pers.comm
India	1	1	And 1 caught in nets	Gopinadha Pillai et.al. 1981,Karupiahh 2001
Indonesia	2	2	1 stranded in 2003 1 found in nets in 2005 and 1 killed ~12.2008 by local whalers in Lembata Isl. All immature.	Dammerman 1926,author's unpublished database
Ireland	54	54		www.iwdg.ie
Israel	15	15		Marchessaux 1980,Kerem et.al.2012
Italy	94	133		http://mammiferimarini.unipv.it author's unpub.datab. Podesta et.al.2006
Jamaica	2	2	~17.1.2010 one stranded alive and swam away	Smithsonian database,author's unpub.datab. Rosario- Delestre et.al.
Japan	81	126		http://svrshl.kahaku.go.jp author's unpub.datab
Johnston Atoll	2	2		Smithsonian database
Kenya	1	1	adult male stranded alive and swam away ~18.3.2005 in Lamu Island	author's unpublished database
Kerguelen Islands	1	1		Robineau and Duhamel 2006
Kiribati	1	1		Ross et.al.1988
Line Islands	1	1		Smithsonian database
Madeira	5	5		L.Freitas pers.comm
Malaysia	2	2	adult male stranded ~19.5.2012 in Penang Island	Jaaman et al.2000,author's unpub.datab.
Maldives	2	2		Anderson et.al.2012
Malta	2	2		S.Muscat pers.comm
Mauritania	1	1		Robineau and Vely 1998
Morocco	1	1	and 1 found dead in fishing nets	Aloncle 1967,author's unpub.datab.
Marshall Islands	2	3	2 stranded ~17.4.2009 Longar Island(adult male and unknown sex)	Smithsonian database,author's unpub.datab.
Martinique	3	3		author's unpublished database, http://crmm.univ-lr.fr
Mauritius	1	1		Smithsonian

Mexico	19	20		Mitchell 1968,Vidal et.al.1993,Aguayo 1988,Urban 2000,G.Gordillo–Morales pers.comm.,J.Pablo Gallo Reynoso pers.comm
Midway Island	3	3		Galbreath 1963,author's unpub.datab.
Monaco	2	2		Rode 1939
Namibia	3	3		Ross and Tietz 1972,author's unpub.datab.
New Caledonia	1	1		C.Garrigue pers.comm
New Zealand	Over 100	Over 100		DOC NZ 2012
North Mariana Isl.	2	2		D.Schofield pers.comm
Northern Ireland	1	1		Wilson and Pitcher 1979
Oman	9	9		Gallagher 1991, Gore et.al.2007
Pakistan	2	2		De Silva 1987,Gore et.al.2007
Panama	2	2	recent stranding ~15.2.2010 Los Santos	Smithsonian database,author's unpub.datab.
Papua New Guinea	2	2		Ross et.al.1988,Hale 1931
Perú	1	1	stranded alive and swam away,2.2012 Reserva Nacional de Paracas,Ica	author's unpublished database
Philippines	5(6)	5(6)		author's unpublished database
Portugal	14	14		M.Sequeira pers.comm
Puerto Rico	23	29		Rosario-Delestre et.al.
Russia	40	40		Allen et.al.2012,author's unpublished database
Saint Vincent and the Grenadines	1	1		Caldwell et al.1971
Salomon Islands	3	3	Adult male stranded Ile Sepulture/ Fouquet ~24.7.2009	Smithsonian database,author's unpub.datab.
Samoa	2	3		www.mnre.gov.ws/documents/newspaper/observer_2May2010.pdf
Scotland	54	54		B.Reid pers.comm,B.McGovern pers.comm
Senegal	1	1		Van Waerebeek et.al. 2004
Seychelles	2	2		Ross 1988,Keller et.al.1982
Sint Maarten	1	1		Rosario-Delestre et.al.
Solomon Islands	1	1		Guppy 1887
South Africa	28	28		Ross et.al.1988,Ross and Tietz 1972, Dalebout et.al.2005,Henry and Best 1999,author's unpub.datab.
South Shetlands	1	1		Strange 1972
Spain	127*	133		A.Lopez pers.comm,J.Bellido pers.comm,P.Cermeno pers.comm,author's unpub.datab.
Sri Lanka	6	6		De Silva 1987,Derayanigala 1963
Sweden	2	2		Lepiksaar 1966
Syria	1	1	425cm female(?) stranded ~16.2.2011 in Latakia.	author's unpublished database
Taiwan	21	23		Wang et al.1995,author's unpublished database

Thailand	1	1		Adulyanukosol et.al.2012
Tonga	1	2	female with calf 5.2009 in Blue Lagoon Resort,Foiata Island	author's unpublished database
Turkey	10	11	calf stranding ~12.4.2012	Kinzelbach 1985,Öztürk and Öztürk 1998,author's unp.datab.
Uruguay	5	5	One stranded alive and swam away(incorrectly identified as hyperoodon planifrons)	A.Le Bas pers.comm
US Virgin Islands	12	14		Rosario-Delestre et.al.
USA	170	174		J.Rice pers.comm,J.Litz pers.comm.G.Lovewell pers.comm,J.Cordaro pers.comm,B.Mahoney pers.comm.,G.Krutzikowsky pers.comm, Mitchell 1968, Smithsonian database,author's unp.datab.
Venezuela	3	3		J.Bolaños pers.comm,Casinos 1981,Romero et.al.2001
Wake Island	2	2		D.Schofield pers.comm
Wales	1	1		R.Penrose pers.comm

*author has 31 Spanish publications of Cuvier's beaked whale strandings in the country.

Discussion and Conclusion

The cosmopolitan distribution of Cuvier's beaked whale strandings confirms their worldwide distribution. However, there do appear to be small, discrete populations that are present that have been studied through tagging and sighting studies. Small resident populations may exist with individuals displaying site-fidelity. The geographic distribution of strandings suggest that this species may be found in abundance in particular areas of the Mediterranean such as the Ligurian and Ionian Seas (Podesta et al., 2006; Revelli et al., 2008), around the Canary (Johnson et al., 2004), and Hawaiian Islands (McSweeney et al., 2007). The monthly distribution of calf strandings may be compared to known sightings of cow-calf pairs to determine the calving period of this species. The monthly distribution of reported strandings also provides insight into variation of reporting effort across geographic regions. Long-term national stranding networks have been present in France and Italy for several decades; however, regional or sporadic reporting is more often present in other countries such as Algeria in the southern Mediterranean. Some countries such as Spain have long-term reports that are not organized into a national stranding network or database (Podesta et al., 2006).

Areas for which there is sparse stranding data, this may reflect lack of suitable beaked whale habitat (i.e., deep water or presence of canyons), or may more be accounted for by a relative lack of reporting or response effort. Continued reporting and investigation of *Ziphius* strandings worldwide will provide valuable data on habitat usage, distribution, disease, and anthropogenic impacts. The stranding data can be used to monitor anthropogenic activities such as acoustic exercises, fisheries interactions, and ingestion of plastics and other marine debris, that can then be linked to stranding occurrence to assess stranding trends over time and risk factors for strandings. Increased reporting and response effort in less populous regions can help fill in data gaps in areas of coastline that may be critical habitat for *Ziphius* and other ziphiids.

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