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Whales and dolphins (Mammalia, Cetacea) of the Cape Verde Islands, with special reference to the Humpback Whale *Megaptera novaeangliae* (Borowski, 1781)

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Keywords: Cetacea, Cape Verde Islands, distribution, whaling history

Abstract

Observations of whales and dolphins in the Cape Verde Islands obtained in 1995 and 1996 are reported and data on the occurrence of 14 taxa are given, including four not previously reported from the region, viz. Bryde's Whale *Balaenoptera edeni*, Killer Whale *Orcinus orca*, Rough-toothed Dolphin *Steno bredanensis*, and Striped Dolphin *Stenella coeruleoalba*. An earlier report of Fin Whale *B. physalus* is reviewed and re-identified as *B. cf. borealis*. Status and occurrence of the Humpback Whale *Megaptera novaeangliae* are discussed at some length. Unpublished observations from other observers are also included and a short account on the history of whaling in the islands is given. A list of all cetacean taxa reliably recorded in the Cape Verde region is presented and unsubstantiated reports are briefly discussed.

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Introduction

The Cape Verde Islands (Fig. 1) are an archipelago consisting of 10 islands and several islets situated

in the Atlantic Ocean c. 500 km west of Senegal, West Africa. The total land area is 4033 km² scattered over 58,000 km² of ocean. These volcanic islands emerge steeply from depths of about 4000 m. The climate is dry tropical but sea conditions are heavily influenced by the cool Canary current that comes from the north. Consistently strong northeast tradewinds produce rough seas, often making navigation around the islands difficult and hazardous. A former Portuguese colony, the islands gained independence and became the República de Cabo Verde in 1975.

Apart from sparse accounts in the historical whaling literature, little has been written about the Cetacea that occur in Cape Verde seas. During the 19th century, a few specimens of dolphins from the area reached Europe and some of these became the holotypes of nominal taxa (cf. Perrin et al., 1987). Reiner et al. (1996) presented an overview of cetaceans recorded in the area, based on their own observations as well as published data, and added a list of taxa whose occurrence in the region they considered likely, referring to published records of strandings and offshore occurrences from the West African mainland. Jefferson et al. (1997) reviewed published records of dolphins and porpoises from West Africa, including the Cape Verde Islands.

In this paper, we report on our observations of whales and dolphins in the Cape Verde Islands. The status and occurrence of the Humpback Whale

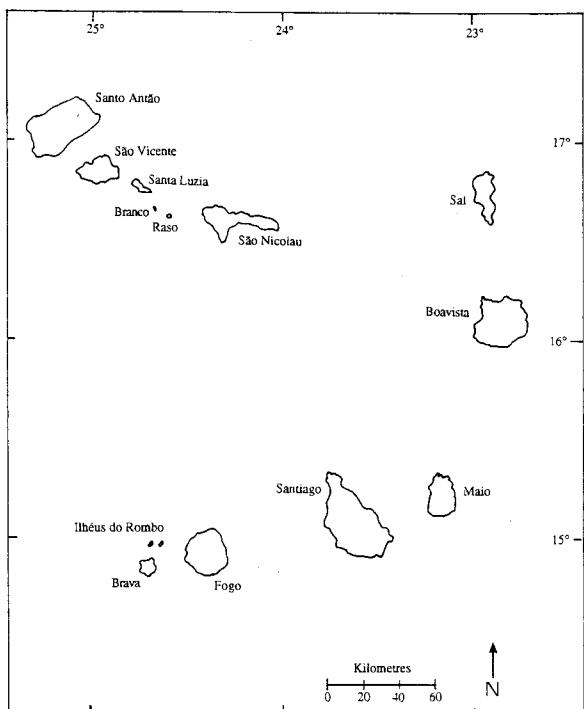


Fig. 1. Map of the Cape Verde Islands.

Megaptera novaeangliae is dealt with in somewhat more detail. A considerable number of additional sightings were obtained from local fishermen but these have been included only when identification proved to be sufficiently reliable. Also included are data from private reports, kindly put at our disposal by other observers, that would easily go unnoticed otherwise. Some corrections to Reiner et al. (1996) and other publications are made. A list of all cetacean taxa reliably recorded in the Cape Verde region – here defined as 14°00'N-18°00'N, 22°00'W-26°00'W – is presented (Appendix 1) and unsubstantiated reports are briefly discussed (Appendix 2).

Short history of whaling in the Cape Verde islands

There has been a long tradition of whaling in the Cape Verde Islands. Already during the 16th century, whale products from the islands were exported to Brazil (Ellis, 1969). As elsewhere, whaling during these early years was of a small-scale artisanal

nature, probably not seriously affecting populations. From the mid-18th century onwards, European and North American whalers began to frequent these waters on a regular basis. João da Silva Feijó, a Portuguese naturalist who stayed in the islands during the 1780s, reported that *baleias* and *cachalotes* were common, attracting many American, English and French whalers (Carreira, 1986). Early reference works on the Cape Verde Islands invariably remarked on the abundance of whales in these waters (e.g. Chelmicki & Varnhagen, 1841; Lopes de Lima, 1844).

In the 19th century, New England whalers hunted Humpbacks during the winter months in Cape Verde seas (Kellogg, 1929; Mitchell & Reeves, 1983). The main hunting area for 'humpbackers' from Provincetown, Massachusetts, was in the West Indies, but "another favorite ground is around the Cape Verde Islands" (Atwood, 1887). Charts in Townsend (1935), mapping 19th century catches by North American whalers, show that Humpback whaling in Cape Verde seas took place in February-May, while another important West African hunting area (Gulf of Guinea) was exploited in June-September. Townsend's (1935) charts of catches of Sperm Whale *Physeter macrocephalus* show that in the Cape Verde area this whale was mainly hunted from October to March.

From the late 18th century, when the first whaling station was established on Brava, considerable quantities of whale oil were also prepared locally. Catching whales from small man-powered boats was a risky business and vivid descriptions of the methods employed and the dangers involved were given by E.J.M. (1864) and Cardoso (1896). In 1874, the *Empresa da Pesca da Baleia do Carriçal e do Tarrafal* was founded on São Nicolau and in 1883 a similar enterprise was undertaken on Sal (Cardoso, 1896; Carreira, 1983). By that time, however, whale populations had already been severely depleted and towards the end of the 19th century foreign whalers began to abandon their activities in Cape Verde seas. Friedlaender (1913), who stayed in the islands for five months in 1912, wrote that there still existed whaling stations on São Nicolau and Maio but that operations had all but ceased due to the scarcity of whales. In 1914, when whales had been almost exterminated in these waters, the Portuguese

colonial government issued a decree in which the capture of immature animals was forbidden and the maximum yearly catch set at 6,000 (Carreira, 1983). This measure, however, came too late to generate an increase of the populations and, in view of the catch size still allowed, probably even had the opposite effect.

Today, dolphins can be found quite regularly in the markets, especially on Santiago, and stranded or weakened offshore whales are readily butchered by the local population despite existing legislation that provides full protection for all cetaceans (Law 17/1987). As with other environmental legislation, there is little or no interest among the local authorities to enforce such laws and consequently the degradation of Capeverdian wildlife, both marine and terrestrial, continues at an alarming rate. The Republic of Cape Verde is not a member of CITES, although discussions about the country joining the convention have been going on for the past 10 years or more.

Methods

Payne & Katona (1986) wrote that they knew of "three groups of scientists who have visited the Cape Verdes [in recent years] to look for Humpbacks but no whales have been seen". In order to improve this situation, one of the authors (FWW) undertook preliminary surveys in the years 1990–1991, the results of which were included in Reiner et al. (1996). In February–April 1995 and February–May 1996, our team (see acknowledgements) conducted dedicated surveys around the southern parts of the island of Sal (Fig. 2) to establish the size and composition of the Humpback population. An important feature of this island is a shallow bay in the southwest (Baía da Mordeira) which may conceivably serve as a Humpback calving area.

Our field work (hereafter referred to as 'Humpback survey') was conducted at sea in a 4.5-m inflatable boat as well as from elevated positions on land. Due to the prevailing strong winds in the Cape Verdes at this time of year, adverse weather conditions often prevented work at sea. Beach surveys to search for stranded marine mammals were conducted for 70% of Sal island. The remain-

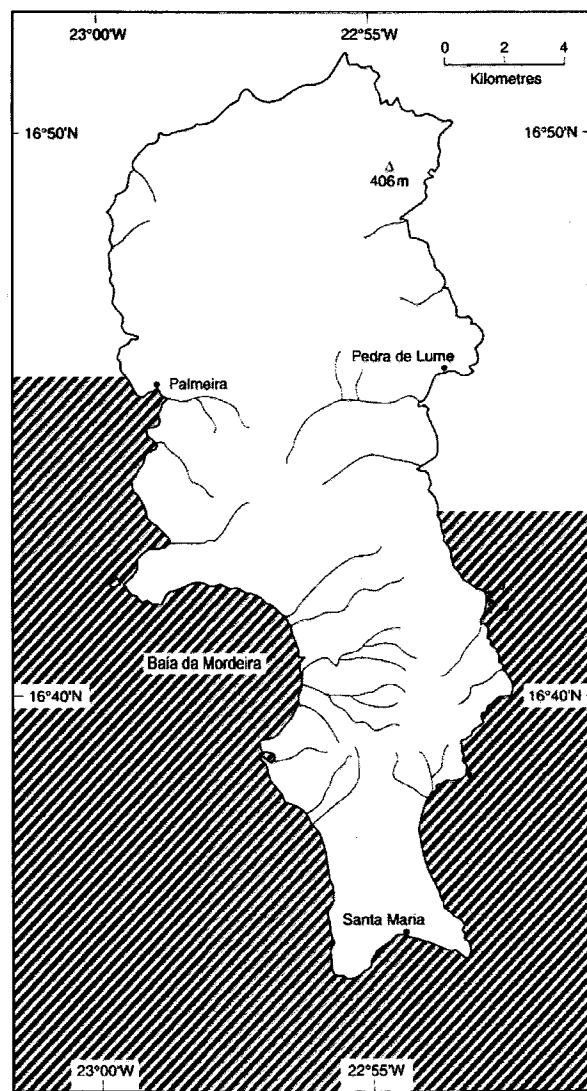


Fig. 2. Map of the island of Sal. The area surveyed in February–April 1995 and February–May 1996 ('Humpback survey') is indicated by hatching.

ing 30% of Sal's shore consists of volcanic rock and cliffs with no beach front or intertidal. In 1996, a number of trips were undertaken to the island of Boavista aboard a larger vessel, enabling us to expand the search for Cetacea beyond our usual range. All Cetacea encountered during the surveys were noted. Unless stated otherwise, general data on world-wide status and distribution in the following are taken from Jefferson et al. (1993). For the sake of convenience, nomenclature follows current usage although we are aware that some

higher taxa – particularly *Tursiops* and *Stenella* – probably constitute para- or polyphyletic assemblages (cf. LeDuc et al., 1999). Taxa not previously reported from the Cape Verde region are marked with an asterisk.

Systematic list

* *Balaenoptera* cf. *borealis* Lesson, 1828 – rorqual whale

Reiner et al. (1996) reported a record of a Fin Whale *B. physalus*, based on a local newspaper item (Voz di Povo, 5 November 1983; not 30 November 1993, contra Reiner et al., 1996: 439) that included two photographs of a beached whale at Cidade Velha, Santiago, 2 November 1983 (not 1993, contra Reiner et al., 1996: 439). Earlier, Lagendijk (1984) referred to the same event and thought the animal to be “most likely a Minke Whale” *B. acutorostrata*. In an attempt to establish the animal’s taxonomic identity, the newspaper and photographs concerned were retrieved from Cape Verde archives and one of the photographs is reproduced here (Fig. 3). According to the newspaper report the whale measured c. 4.5 m in length, indicating a young or newborn animal and presumably excluding *B. physalus*, which has a length of 6-6.5 m at birth (Jefferson et al., 1993). As far as can be discerned from the photographs, the animal’s ventral side is largely darkly coloured, this being another indication of it not being *B. physalus*, in which the underparts are whitish. The head does not appear to be markedly V-shaped as in *B. acutorostrata* but seems rather rounded. The left pectoral flipper appears to be chopped off and consequently the presence of a white band – typical of *B. acutorostrata* – cannot be verified. Colouration and head shape suggest either Sei Whale *B. borealis* or Bryde’s Whale *B. edeni*. Mostly white baleen bristles – as in the Sei Whale – are apparent, the baleen plates themselves being largely hidden by the bristles. The dome-shaped rostrum with a fairly strong curvature of the maxillaries distinguishes the Sei Whale from the Bryde’s Whale. The almost homogeneous grey colouration of the throat and lips are also indicative of the Sei Whale. Al-

though variable, Bryde’s Whales often have dark lips contrasting with a white throat. In view of these features, we provisionally identify the animal as a Sei Whale, a taxon which has not been reported previously from the Cape Verde region. However, on the basis of the photographs alone, Bryde’s Whale cannot be excluded with certainty. Reiner et al. (1996) claimed the animal to be a male, but the photographs do not provide evidence for this and neither was the sex hinted at in the newspaper report. The Sei Whale is distributed world-wide in temperate waters and seems to enter tropical seas more often than the Fin Whale. Due to the difficulty of distinguishing Sei and Bryde’s Whales, the tropical distribution of the former is poorly known.



Fig. 3. Juvenile rorqual whale *Balaenoptera* cf. *borealis* brought ashore by fishermen, Cidade Velha, Santiago, Cape Verde Islands, 2 November 1983 (photo originally published in Voz di Povo, Ano IX, No. 358, 5 November 1983).

* ***Balaenoptera edeni*** Anderson, 1879^{1,2} – Bryde's Whale

Occurs world-wide in tropical and subtropical waters, often near shore in areas of high productivity. Referring to a record from Senegal, Reiner et al. (1996) listed Bryde's Whale as likely to occur in the archipelago and this can now be confirmed. A cow and calf were seen off Tarrafal, São Nicolau, 28 September 1988 (CJH). Close views could be obtained and the three characteristic ridges on the anterior part of the adult's head were seen. In addition, a freshly stranded calf was found on the beach c. 8 km south of Sal Rei, Boavista, 29 February 1996 (Humpback survey).

Megaptera novaeangliae (Borowski, 1781) – Humpback Whale

The Humpback Whale is distributed world-wide, migrating from the tropics (breeding areas) to polar or subpolar seas (feeding areas). Historically, North Atlantic Humpback Whales wintered in the Caribbean and around the Cape Verde Islands (Townsend, 1935; Mitchell & Reeves, 1983; Bannister et al., 1984; Winn & Reichley, 1985). The total North Atlantic population has recently been estimated at c. 10,500 (Smith et al., 1999). This is substantially larger than estimates made in the 1980s (cf. Katona & Beard, 1990) but it is unclear whether this indicates a genuine population growth or simply reflects improved methods of estimation.

Monthly distribution maps based on data collected during the 1950s show an increase of Humpback sightings off West Africa between 20°N and 20°S in March-May and September-October (Slipper et al., 1964). These authors suggested that animals seen in spring may belong to northern populations while those present in autumn may be of southern origin. This would imply that, although there is spatial overlap between northern and southern stocks at these latitudes, temporal separation would pre-

¹ The date of Anderson's description is usually, but incorrectly, cited as 1878 (cf. Rice, 1998).

² The taxonomic status of 'Bryde's Whale' is complex and, as currently defined, probably includes two or more diagnosably distinct taxa (cf. Baker & Palumbi, 1997; Rice, 1998).

vent genetic exchange between animals originating from opposing hemispheres. According to Christensen (1984), most evidence supports the conclusion that Humpbacks from the Norwegian and Barents Seas constitute a feeding aggregation of stocks breeding in the western North Atlantic. This has been confirmed by resightings of at least seven Humpbacks in the West Indies that had been photographed along the Norwegian coast (Stevick et al., 1998; P.T. Stevick in litt., 1999) and is consistent with the results of genetic tagging (Palsbøll et al., 1997; Smith et al., 1999). Hence, the stock affinities of Humpbacks occurring in the Cape Verde region remain unresolved.

Molecular studies of genetic differentiation within and among different stocks from the North Pacific, North Atlantic and Antarctic Oceans found a highly structured pattern between different populations but could not exclude the possibility of limited gene flow between Humpbacks from the North Atlantic and Antarctic Oceans (e.g. Baker et al., 1990, 1993, 1994; Palsbøll et al., 1997; Valsecchi et al., 1997). These studies did not include samples from Humpbacks wintering in Cape Verdean or adjacent West African waters. Fluke photographs ($n = 24$) obtained in 1991, 1995 and 1999 (Reiner et al., 1996; Carrillo et al., 1999) have not matched any animal in the North Atlantic Humpback Whale Catalogue, nor in the Years of the North Atlantic Humpback (YONAH) catalogue, which together hold 10,000+ photographs of flukes. This in itself is perhaps an indication that a distinct eastern Atlantic stock, wintering off West Africa, still exists, because the catalogued photographs almost exclusively stem from the western Atlantic. In order to shed further light on the geographical origin of the animals wintering in the Cape Verde region, additional fluke photographs, sound recordings and sloughed-skin-biopsies will need to be collected during future Cape Verde Humpback surveys.

Recent observations of Humpbacks in the Cape Verde region can be summarized as follows. In 1979, Winn et al. (1981) obtained 13 song sequences (presumably from a single individual) in the Cape Verdes and found these to be essentially equivalent to songs from the West Indies, suggesting that exchange between these two breeding grounds may occur. During a three-week cruise in the archipelago

Table I. Observations of Humpback Whale *Megaptera novaeangliae*.

Date	Number	Location	Source
20 February 1995	1 (singer)	W. of Palmeira, Sal	Humpback survey
8 March 1995	1 (singer)	W. of Palmeira, Sal	Humpback survey
10 March 1995	3 (incl. cow & calf)	Porto Novo, Santo Antão	W. Williams
18 March 1995	1	off western Sal	fishermen
20 March 1995	1 (singer)	1 km S. of Santa Maria, Sal	Humpback survey
22 March 1995	1	off Palmeira, Sal	Humpback survey
23 March 1995	2 (cow & calf)	Baía da Mordeira, Sal	Humpback survey
24 March 1995	2 (cow & calf)	Baía da Mordeira, Sal	Humpback survey
25 March 1995	1	off Palmeira, Sal	Humpback survey
30 March 1995	1 (singer)	off W.S.W. Sal	Humpback survey
31 March 1995	1 (singer)	W. of Santa Maria, Sal	Humpback survey
13 April 1995	2 (cow & calf)	off Santa Maria, Sal	windsurfer
10 March 1996	2 (cow & calf)	off Palmeira, Sal	fishermen
19 March 1996	2 (cow & calf)	off Palmeira, Sal	fishermen
24 March 1996	3	off N.W. Boavista	fishermen
30 March 1996	1	2 km S. of Santa Maria, Sal	fishermen
9 April 1996	2	off Santa Maria, Sal	Humpback survey
10 April 1996	2	off Santa Maria, Sal	Humpback survey
11 April 1996	1	off Sal Rei, Boavista	J. Soares
16 April 1996	2	eastcoast of Sal	fishermen
16 April 1996	1 (singer)	N. of Sal Rei, Boavista	fishermen
17 April 1996	2 (cow & calf)	Baía da Mordeira, Sal	Humpback survey
19 April 1996	1	off Palmeira, Sal	fishermen
20 April 1996	2	E. of Santa Maria, Sal	Humpback survey
20 April 1996	5-6 (incl. cow & calf)	N.W. of Sal Rei, Boavista	Humpback survey
22 April 1996	2 (breaching)	5 km E. of Santa Maria, Sal	Humpback survey
22 April 1996	2	5 km N. of Sal Rei, Boavista	J. Soares
12 May 1996	1 (singer)	4 km S.E. of Santa Maria, Sal	Humpback survey

in March-April 1984, Lagendijk (1984) sighted only a single Humpback. The preliminary 1990-1991 surveys yielded a total of six observations, while several more were reported by fishermen and other sea-going people. An additional two sightings as well as a number of strandings were reported by Reiner et al. (1996). In 1995 and 1996, our observations of Humpback Whales around the islands of Sal and Boavista numbered 12 and 16, respectively, including reports by local observers (Table I; Fig. 4). Only two of these Humpback sightings related to a cow and newborn calf in a shallow (< 15 m) protected area (Baía da Mordeira, 23-24 March 1995 and 17 April 1996), although other cows with calves were observed not far from there off Palmeira. Interestingly, airplane pilots who often fly low over Baía da Mordeira before landing at Sal airport, informed us that they "quite regularly observed Humpbacks" there at this time of year. The pilots identified Humpbacks by their long

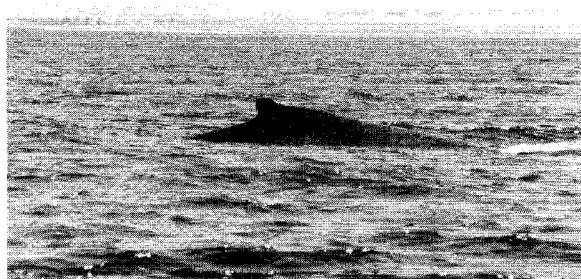


Fig. 4. Humpback Whale *Megaptera novaeangliae*, Baía da Mordeira, Sal, Cape Verde Islands, 23 March 1995 (photo by F.W. Wenzel).

whitish flippers being clearly visible in the blue water.

Because it is possible that on different occasions the same animal(s) were encountered, it is diffi-

cult to give an estimate of the number of individuals sighted during the surveys. Nevertheless and given that the total eastern North Atlantic stock has been estimated at c. 100 animals (Winn & Reichley, 1985), it can be concluded that the Cape Verde region still constitutes an important breeding area, even though numbers today may constitute only a pale shadow of those in the past.

Physeter macrocephalus Linnaeus, 1758 – Sperm Whale

Sperm Whales are widely distributed in the oceans around the world. Reiner et al. (1996) mentioned three strandings and six sightings. These authors stated that they "found no previous record, including the historical whaling literature". This is surprising because Townsend (1935), to which Reiner et al. (1996) referred elsewhere in their paper, mapped a large number of Sperm Whale catches in the Cape Verde region based on 19th-century logbooks of American whaleships. Indeed, apart from Humpbacks, Sperm Whales were the main target for whalers in these seas and *cachalotes* are often mentioned as an important resource in the 18th- and 19th-century literature on the islands (e.g. Chelmicki & Varnhagen, 1841; Lopes de Lima, 1844; Fournier, 1847; J. da Silva Feijó in Carreira, 1983). No Sperm Whales were observed in 1995–1996, but there is a recent sighting of at least 11 very active and tail-slapping individuals at about two thirds of the way from Fogo to Santo Antão (approx. 16°20'N, 25°00'W), with one individual breaching clear of the water seven times in succession, 18 January 1989 (K.M. Morgan).

* ***Orcinus orca*** (Linnaeus, 1758) – Killer Whale

Killer Whales are distributed world-wide but are more common in cold-temperate to subpolar waters. There are many records from West Africa (summarized by Jefferson et al., 1997) as well as a sighting at 19°01'N, 19°41'W (northeast of the Cape Verdes), 18 April 1816 (Reeves & Mitchell, 1988). In view of this evidence, Reiner et al. (1996) listed the Killer Whale as likely to occur in the

region. We report the sighting of a herd of nine animals, 4–5 km south of Santa Maria, Sal, 29 February 1996 (Humpback survey), which appears to be the first documented record from Cape Verde seas.

Grampus griseus (G. Cuvier, 1812) – Risso's Dolphin

A cosmopolitan tropical and warm temperate taxon of which Reiner et al. (1996) reported a single observation for the region, viz. c. 20 animals off eastern Santo Antão, 26 June 1993. We add a sighting of at least three animals in the lee of Raso islet (at the same time as a group of *Steno bredanensis*, see below), 25 January 1989 (K.M. Morgan). The specimen listed as being collected in the Cape Verde Islands by Broekema (1983) was actually obtained in the Azores (cf. Reiner et al., 1996).

Globicephala melas (Traill, 1809) – Long-finned Pilot Whale

The Long-finned Pilot Whale is the temperate to subpolar counterpart of the Short-finned Pilot Whale. There are a few records from West Africa (summarized by Jefferson et al., 1997) and two reports from the Cape Verde region (Lagendijk, 1984), although no details were given as to how the latter were distinguished from *G. macrorhynchus*. On 3 March 1995, the stranded remains of 5–8 pilot whales, including one large male and one calf – all in an advanced state of decay – were found along Baía da Mordeira, Sal (Humpback survey). These were identified as *G. melas* on the basis of their cranial morphology (5–7 partial skulls, 5 right mandibles, 1 left mandible; specimens not preserved), notably the more elongated rostrum compared to *G. macrorhynchus*. The extent of distributional overlap between Long-finned and Short-finned Pilot Whale in the northeastern Atlantic was discussed by Nores & Pérez (1988), who concluded that the former may range south to Mauritania while the latter regularly occurs as far north as the Bay of Biscay.

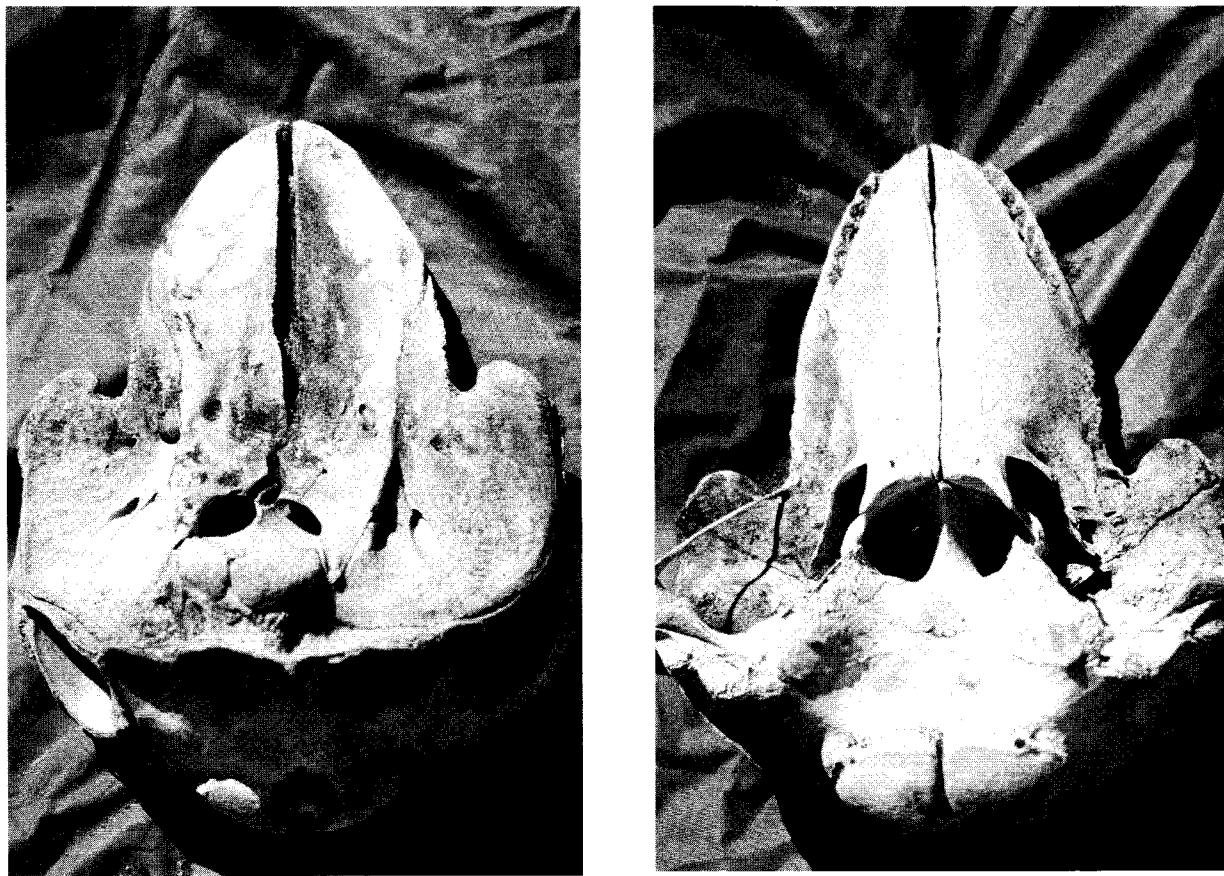


Fig. 5. Dorsal (A) and ventral view (B) of skull of stranded Short-finned Pilot Whale *Globicephala macrorhynchus*, Sal, Cape Verde Islands, March 1996 (photos by F.W. Wenzel).

Table II. Observations of Short-finned Pilot Whale *Globicephala macrorhynchus*. Observations marked* refer to unidentified *Globicephala* sp.

Date	Number	Location	Source
1 February 1985	c. 12	between Cima and Fogo	S.C. Madge
14 January 1986	>10*	16°41'N, 24°52'W	C.J. Camphuysen
29 February 1996	12-15	6-7 km S. of Santa Maria, Sal	Humpback survey
5 March 1996	15	3-4 km S. of Santa Maria, Sal	Humpback survey
17 March 1996	2	1 km S. of Santa Maria, Sal	Humpback survey
18 March 1996	22-30	2 km S. of Santa Maria, Sal	Humpback survey
11 April 1996	20*	5 km S. of Santa Maria, Sal	J. Soares
13 April 1996	40-50*	5 km E. of Santa Maria, Sal	fishermen
21 April 1996	20-25	6 km S. of Santa Maria, Sal	Humpback survey

***Globicephala macrorhynchus* Gray, 1846 – Short-finned Pilot Whale**

Widespread in tropical to warm temperate seas in oceanic to coastal waters, the Short-finned Pilot Whale has been reported from the Cape Verde

region on three previous occasions (cf. Lagendijk, 1984; Reiner et al., 1996). Hundreds of vertebrae, ribs and a number of skulls, strewn over kilometres of beach, were found along the shore c. 8 km south of Pedra de Lume, Sal, in March 1995. Local fishermen reported that as many as 150 pilot whales



Fig. 6. Beached Short-finned Pilot Whales *Globicephala macrorhynchus*, Maio, Cape Verde Islands, probably late 1920s (photo reproduced from Boletim da Agência Geral das Colónias, 45: 213, 1929).

came ashore there in 1972 and that another group (10-30) beached in 1990. According to a local informant, 3-4 *Globicephala* sp. were stranded on Currinho beach, Boavista, in September or October 1995. In March 1996, a skeleton was found along the shore c. 8 km northeast of Santa Maria, Sal (Fig. 5; specimen not preserved). It was locally reported that this animal had stranded in mid December 1995.

A photograph taken on the island of Maio at some time during the late 1920s, published in Lopes (1929), shows two beached Short-finned Pilot Whales (Fig. 6). The original caption reads (translated from the Portuguese):

"Island of Maio – Two examples of the 'Black Fish' (*Globicephalus* sp.). These fishes [sic], which can attain a weight of 400 kilograms, become stranded on the coasts of this island at certain times of the year. At dawn, they are thrown on the sand in groups of 40 to 50. Their meat, when salted and kept in barrels, is a true delicacy befallen to the island because it guarantees the alimentation of its inhabitants throughout the year. It is said

that it is exactly during the years of greatest misery that they appear in the largest numbers."

In the accompanying article, no reference is made to the photograph, nor is there any further mentioning of Cetacea. Recent observations at sea, including records of unidentified *Globicephala* sp., are given in Table II. Despite the paucity of earlier reports, the number of recent records leads us to conclude that Short-finned Pilot Whale is common in the region.

*** *Steno bredanensis* (G. Cuvier in Lesson, 1828) – Rough-toothed Dolphin**

Occurs world-wide in tropical and subtropical seas but seems to be nowhere numerous. Referring to records from Senegal and Mauritania, Reiner et al. (1996) mentioned Rough-toothed Dolphin as likely to occur in Cape Verdean seas and this is confirmed by recent observations. Apart from three sightings obtained in the Sal-Boavista area in 1996, two earlier records have come to our attention (Table III). The source of a record just south of the Cape Verde Islands mapped by Miyazaki & Perrin (1994) is unclear and possibly stems from a confusion with Cap Vert, Senegal (W.F. Perrin in litt., 1999).

***Delphinus* spp. – common dolphin**

Common dolphins are distributed world-wide in tropical to warm temperate seas. Reiner et al. (1996) listed seven observations of *Delphinus* spp. and Lagendijk (1984) reported a single sighting of common dolphins. In view of the recent taxonomic revision of *Delphinus* (cf. Heyning & Perrin, 1994; Rosel et al., 1994), Reiner et al. (1996) refrained

Table III. Observations of Rough-toothed Dolphin *Steno bredanensis*.

Date	Number	Location	Source
16 January 1989	7-8	off S.W. Santiago	K.M. Morgan
25 January 1989	7+	off S. Raso	K.M. Morgan
21 March 1996	6-8	2 km S. of Santa Maria, Sal	Humpback survey
28 March 1996	10-15	10 km N. of Sal Rei, Boavista	Humpback survey
21 April 1996	12-18	4 km N. of Sal Rei, Boavista	Humpback survey

Table IV. Observations of Bottlenose Dolphin *Tursiops truncatus*.

Date	Number	Location	Source
6 February 1985	c. 12	S.W. of Boavista	S.C. Madge
8 February 1985	c. 10	between São Nicolau and Raso	S.C. Madge
9 February 1985	c. 25	between Cima and Fogo	S.C. Madge
13 February 1985	c. 10	off east coast of Brava	S.C. Madge
14 January 1986	c. 20	16°36'N, 24°30'W	C.J. Camphuysen
6 March 1986	c. 10	off S.W. Santiago	C.J. Hazevoet
12 January 1989	15+	between Maio and Boavista	K.M. Morgan
5 June 1989	c. 25	off São Filipe, Fogo	C.J. Hazevoet
21-22 March 1995	c. 50	off Santa Maria, Sal	tourists/Dive Shop
6 March 1996	40-50	5-6 km E. of Santa Maria, Sal	Humpback survey
21 March 1996	40-50	2 km S. of Santa Maria, Sal	Humpback survey
22 March 1996	20-25	3 km S. of Santa Maria, Sal	Humpback survey
23 March 1996	20-25	3 km S. of Santa Maria, Sal	Humpback survey
21 April 1996	4-7	6 km S. of Santa Maria, Sal	Humpback survey
22 April 1996	20-30	4 km E.S.E. of Santa Maria, Sal	Humpback survey
30 January 1999	20+	off west coast of São Nicolau	M. Nunes & C. Santos

from assigning these sightings to either Short-beaked Common Dolphin *D. delphis* Linnaeus, 1758, or Long-beaked Common Dolphin *D. capensis* Gray, 1828, because both taxa may occur in the region and these would be difficult to separate during observations at sea. One more sighting has come to our attention: seven common dolphins seen at 17°17'N, 24°34'W (north of Santa Luzia), 12 January 1986 (C.J. Camphuysen), were reported to be *D. delphis* but the possibility of *D. capensis* again cannot be excluded. Reiner et al. (1996) claimed that *Delphinus* is "the most abundant cetacean in the Cape Verdes". However, given the number of *Globicephala* and *Tursiops* observations (cf. Tables II and IV) and the few records of *Delphinus* reported during the last decade, it may be questioned whether this is indeed the case.

***Tursiops truncatus* (Montagu, 1821) – Bottlenose Dolphin**

With a world-wide distribution in mainly coastal tropical and temperate seas, the Bottlenose Dolphin is among the commonest cetaceans in the archipelago. Reiner et al. (1996) listed 13 records and earlier Lagendijk (1984) reported two sightings. To these, another 15 observations can now be added (Table IV; Fig. 7).



Fig. 7. Bottlenose Dolphins *Tursiops truncatus*, off Santa Maria, Sal, Cape Verde Islands, 22 March 1996 (photo by D. Holcer).

***Stenella attenuata* (Gray, 1846) – Pantropical Spotted Dolphin**

The Pantropical Spotted Dolphin occurs world-wide throughout tropical and subtropical oceans (Perrin et al., 1987). One (not two; contra Reiner et al., 1996) was collected at 16°40'N, 21°00'W, just east of the study area, during the mid-19th century. It was described and named *Clymene punctata* by Gray (1866) – a junior synonym of *S. attenuata* – and considered the only record for the region by Reiner et al. (1996). However, Cadenat (1959) reported a 'spotted dolphin' obtained in Praia, Santiago, provisionally identified as *Clymene*

punctatus in his text but referred to as *Stenella* indet. in the caption of a photograph of the specimen (cf. Cadenat 1959: 1393 & Plate XVIII), which is in fact of the present taxon (cf. Perrin et al., 1987). This animal was collected in June 1950 (given as 1951 by Cadenat, 1959) and the skull is kept in the collection of the Zoölogisch Museum, Amsterdam (see Appendix 1). A dolphin captured between Boavista and Maio by Antoine Joseph Pernety in 1763 or 1764 (cf. van Bree, 1971) was possibly referable to *S. attenuata* (Perrin et al., 1987). In addition, two *Stenella* specimens from the Cape Verde Islands in the old collection of the Museu Bocage, Lisbon (destroyed by fire in 1978), may have been either *S. attenuata* or *S. frontalis* (Hazevoet, 1999).

We report the following recent observations: 4+ in the lee of Sal at dusk, 26 January 1989 (K.M. Morgan) and 6-8 animals c. 3 km south of Santa Maria, Sal, 22 March 1996 (Humpback survey).

***Stenella frontalis* (G. Cuvier, 1829) – Atlantic Spotted Dolphin**

This is an endemic taxon of the tropical to warm-temperate Atlantic Ocean (Perrin et al., 1987). There are two old records from Cape Verde seas. One concerns the holotype of *Delphinus frontalis* G. Cuvier, 1829, while the other is the holotype of *Delphinus froenatus* F. Cuvier, 1829, the latter being a junior synonym of the former (cf. Perrin et al., 1987; Appendix 1). Lagendijk (1984) and Reiner et al. (1996) both reported a single sighting, to which we can add the following observations: 20-50 close inshore off the western coast of Fogo, 13 February 1985 (S.C. Madge), c. 20 off western São Nicolau, 23 February 1991 (CJH), and c. 15 west of São Nicolau, 30 January 1999 (M. Nunes & C. Santos). Caution is needed with all of these records because identification of spotted dolphins at sea is notoriously difficult and the possibility of confusion with *S. attenuata* cannot be ruled out completely.

*** *Stenella coeruleoalba* (Meyen, 1833) – Striped Dolphin**

The Striped Dolphin is distributed world-wide in temperate, subtropical, and tropical seas but there is only a relatively small number of records from West Africa (cf. Jefferson et al., 1997). The taxon was not mentioned by Reiner et al. (1996), neither as confirmed nor as potentially occurring in the Cape Verde region. Here we report the sighting of at least 15 Striped Dolphins off the western coast of Fogo, 10 February 1999 (M. Nunes & C. Santos). Identification was based on the two black stripes extending from the eye to the anus and flippers, the grey backs with large stripes of light grey on the sides, and the pale belly.

A record at 18°00'N, 24°00'W (Wilson et al., 1987; Perrin et al., 1994) probably stems from a mixing up of data and likely represents the same as that just north of Cap Vert, Senegal, the latter being based on a specimen in the Muséum national d'Histoire naturelle, Paris, from that location (W.F. Perrin in litt., 1999). The reference for the record north of the Cape Verde Islands given by Wilson et al. (1987) is an error (W.F. Perrin in litt., 1999).

***Stenella longirostris* (Gray, 1828) – Spinner Dolphin**

Spinner dolphins occur throughout the tropical and subtropical oceans. Reiner et al. (1996) reported three sightings from the Cape Verde region. To this we add the sighting of 25-30 animals, 5-6 km south of Santa Maria, Sal, 29 February 1996 (Humpback survey). These could be distinguished from *S. clymene* (Gray, 1846) by their distinctively long beaks (cf. Perrin et al., 1981).

Discussion

Apart from those discussed above, there are confirmed records of three more taxa from the Cape Verde region, viz. Blue Whale *Balaenoptera musculus* (Linnaeus, 1758), Cuvier's Beaked Whale *Ziphius cavirostris* G. Cuvier, 1823, and Melon-headed Whale *Peponocephala electra* (Gray, 1846)

(see Appendix 1). Klinowska (1991), referring to Kirpichnikov (1950), claimed the existence of "an East Atlantic stock [of Blue Whale] wintering at the Cape Verde Islands". However, Kirpichnikov (1950) only reported a few sightings between the Cape Verde Islands and the African mainland and there is nothing in his text justifying Klinowska's (1991) assertion.

Based on published records from Mauritania, Senegal, and Guinea-Bissau, Reiner et al. (1996) suggested the Northern Right Whale *Eubalaena glacialis* (Müller, 1776), Pygmy Sperm Whale *Kogia breviceps* (De Blainville, 1838), Gervais' Beaked Whale *Mesoplodon europaeus* Gervais, 1855, Pygmy Killer Whale *Feresa attenuata* Gray, 1874, Atlantic Hump-backed Dolphin *Sousa teuszii* (Kükenthal, 1892), Clymene Dolphin *Stenella clymene* (Gray, 1846), and Harbour Porpoise *Phocoena phocoena* (Linnaeus, 1758) as potentially occurring in Cape Verde seas. Of these, *S. teuszii* and *E. glacialis* seem rather unlikely candidates because of the former's exclusively coastal habits and marked preference for shallow waters and the latter's great rarity at these latitudes (see also Appendix 2). While *P. phocoena* has been recorded as far south as Mauritania and Senegal (Smeenk et al., 1992), throughout its range it is limited to the waters of the continental shelf (Read, 1999) and its occurrence in the deep Cape Verdean seas seems unlikely. Equally, alleged records of *P. phocoena* from the Azores are now considered dubious (Reiner et al., 1993). Other taxa recorded in adjacent parts of the eastern Atlantic and potentially occurring in Cape Verde seas include Blainville's Beaked Whale *Mesoplodon densirostris* (De Blainville, 1817), True's Beaked Whale *M. mirus* True, 1913, False Killer Whale *Pseudorca crassidens* (Owen, 1846), and Fraser's Dolphin *Lagenodelphis hosei* Fraser, 1956 (cf. Vonk & Martin Martel, 1988; Jefferson et al., 1997).

Although for some taxa there is now a substantial number of observations, we want to emphasize that all reports of cetaceans from the region remain equally important. Knowledge of spatial and temporal distribution as well as the numbers involved is still rudimentary and only continued reporting can improve this. The collection of data on strandings is hampered by the absence of local

naturalists in the Cape Verde Islands, making it virtually impossible to establish a network of correspondents like those operating in other countries. There being no local university or other institutions that could coordinate and stimulate whale and dolphin studies, it is not to be expected that this situation will improve in the foreseeable future. For the time being, progress in knowledge of the Cetacea of the Cape Verde archipelago will have to come from the efforts of visiting researchers. Reports of sightings and strandings (both old and new) from the Cape Verde region (14°00'N-18°00'N, 22°00'W-26°00'W) will be gratefully received by the authors. Photographic evidence, newspaper items relating to strandings, etc. will also be welcomed, as will information on specimens not included in Appendix 1. All data will be filed in the Cape Verde Cetacean Archive kept at the Museu Bocage, Lisbon, Portugal. It is hoped that this will enable us to present regular updates on the status and occurrence of whales and dolphins in the Cape Verde Islands

Acknowledgements

We wish to thank C.J. Camphuysen, Steve Madge, Kevin Morgan, Manuela Nunes, Carlos Santos, James Soares, and W. Williams for informing us about their observations of Cetacea in Cape Verde. We also thank the fishermen (not all known by name to us) from the islands of Sal and Boavista for communicating their observations to us. The contributions of our collaborators in the Humpback surveys in 1995 (Melissa Alexander, Sandrine Guitard, and Sue Ryan) and 1996 (Rebecca Clark and Drasko Holcer) have been indispensable. We want to thank P.J.H. van Bree, C.J. Camphuysen, T.A. Jefferson, J.G. Mead, W.F. Perrin, D.W. Rice, R.C. Sabin, C. Smeenk, and K.C.C. Van Waerebeek for answering queries during the preparation of this paper. W.F. Perrin and K.C.C. Van Waerebeek also commented on a draft version. José Maria Semedo helped in recovering photographs from Cape Verde archives and Peter Stevick informed us about resightings of Humpback Whales between Norway and the West Indies. FWW received equipment and financial support from Allied Whale (U.S.A.), Center for Coastal Studies (U.S.A.), Cetacean Society International (U.S.A.), Mrs. Mary Pratt-Hauvermale (U.S.A.), and the Whale and Dolphin Conservation Society (U.K.). CJH acknowledges a grant from the Netherlands' Ministry of Agriculture, Nature Management and Fisheries (Division of International Affairs).

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Received: 10 November 1999

Appendix 1

Cetacea recorded in the Cape Verde region (14°00'N-18°00'N, 22°00'W-26°00'W). Only taxa the occurrence of which is supported by substantial evidence (specimen, photograph, conclusive description) are included. Sources: 1 – Townsend (1935); 2 – Cadenat (1959); 3 – Lagendijk (1984); 4 – Haase (1987); 5 – Perrin et al. (1987); 6 – Reiner et al. (1996); 7 – Hazevoet & Wenzel (this paper). Museum acronyms: MBL – Museu e Laboratório Zoológico e Antropológica (Museu Bocage), Lisboa, Portugal; MNHN – Muséum national d'Histoire naturelle, Paris, France; ZMA – Zoölogisch Museum, Amsterdam, the Netherlands.

Taxon	Source	Specimen
<i>Balaenoptera musculus</i>	6	
<i>Balaenoptera cf. borealis</i>	7	
<i>Balaenoptera edeni</i>	7	
<i>Megaptera novaeangliae</i>	1, 6, 7	
<i>Physeter macrocephalus</i>	1, 6, 7	
<i>Ziphius cavirostris</i>	4	
<i>Peponocephala electra</i>	6	MBL 22.175
<i>Orcinus orca</i>	7	
<i>Grampus griseus</i>	6, 7	
<i>Globicephala melas</i>	3, 7	
<i>Globicephala macrorhynchus</i>	3, 6, 7	
<i>Steno bredanensis</i>	7	
<i>Delphinus delphis/capensis</i>	3, 6, 7	
<i>Tursiops truncatus</i>	3, 6, 7	
<i>Stenella attenuata</i>	2, 5, 7	ZMA 22.962
<i>Stenella frontalis</i>	3, 5, 6, 7	MNHN A-3034, A-3035
<i>Stenella coeruleoalba</i>	7	
<i>Stenella longirostris</i>	6, 7	

Appendix 2.

Unsubstantiated reports of cetaceans from the Cape Verde region (14°00'N-18°00'N, 22°00'W-26°00'W). These reports were not supported by any documentation confirming the identity of the taxa discussed.

Slipper et al. (1964) charted five sightings of Northern Right Whales *Eubalaena glacialis* between 10°N-20°N and 20°W-30°W obtained during the 1950s and mentioned the sighting of a herd of 22 Northern Right Whales with a calf in August (no year given) between 10°N and 20°N "near the Cape Verde Islands". As no details on identification nor precise dates were given, these reports are considered unsubstantiated. Apart from the great rarity of the taxon in the eastern Atlantic in general and at these latitudes in particular, there is no evidence for the historical occurrence of right whales in the Cape Verde region.

Apart from the record of *Balaenoptera cf. borealis* misidentified as Fin Whale *B. physalus* discussed in the Systematic List above, Reiner et al. (1996) also listed a sighting of two individuals of *B. physalus*. As no details on identification were given, we consider this report to be unconfirmed. No documented records of Fin Whale from the Cape Verde region are known to us.

Ruud (1937) stated that the Northern Bottlenose Whale *Hyperoodon ampullatus* has been seen as far south as the Cape Verde Islands, without giving a source for this assertion. Equally, a listing of the taxon for the Cape Verde region by Martin et al. (1992) was not supported by any evidence. We are not aware of any documented records from Cape Verde seas. In fact, there appear to be no reports of the Northern Bottlenose Whale from the East Atlantic south of the Azores and the Mediterranean (J.G. Mead in litt., 1999).

Listings for the Cape Verde Islands of the Dwarf Sperm Whale *Kogia simus* (Martin et al., 1992) and Pigmy Killer Whale *Feresa attenuata* (Martin et al., 1992; Jefferson et al., 1997) were not supported by any evidence and should be disregarded.