

Recent sightings of southern right whales in Mozambique.

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ABSTRACT

The presence of southern right whales (*Eubalaena australis*) along the coast of Mozambique has not been recorded since the close of commercial whaling in 1923. This paper describes ten sightings (5 ‘confirmed’ and 5 ‘probable’) made from land-based observations, boat-based ‘single-day’ surveys as well as land-based and inshore boat-based incidental sightings between 1997 and 2009. The number of sightings increased over the 1997 and 2009 time period and occurred only during August and September. On one occasion, a mother-calf pair was recorded. We also describe an interaction between a southern right whale and humpback whale, which was observed on at least two days. These recent sightings confirm that southern right whales have resumed visiting the coast of Mozambique, albeit in probably very low numbers.

Keywords: Southern right whale, *Eubalaena australis*, Mozambique, distribution, whaling.

INTRODUCTION

Southern right whales (*Eubalaena australis*) were once widely distributed in the three ocean basins within the Southern Hemisphere (Perry *et al.*, 1999). They were exploited by commercial whaling from about 1770 until receiving protection in 1935 (although some illegal exploitation continued thereafter (Tormosov *et al.*, 1998). During this time, stocks were reduced overall from an estimate of about 60,000 individuals to a critically low estimate of 300 individuals (60 breeding females) in 1920 (IWC, 2001; Jackson *et al.*, 2008; Tormosov *et al.*, 1998), although these modeled estimates depend heavily on estimates of historical catch levels and population increase rates. The depletion of Southern African right whale stocks has become retracted (southwards) from that of its historical range (Richards, 2009), at least in lower latitudes. Right whales are now primarily occurring along the south and west coast of South Africa. A similar pattern has been observed with North Pacific right whale (*Eubalaena japonica*) where the size and range of the population is considerably diminished relative to that during the peak period of whaling for this species during the 19th century (Clapham *et al.*, 2004). Using a combination of historical whaling records and contemporary distribution data, the IWC (2001) recognized 11 putative breeding stocks (sub-Antarctic New Zealand, Australia, Central Indian Ocean, Mozambique, South Africa, Namibia, Tristan da Cunha, Brazil, Argentina, Chile/Peru, mainland New Zealand/Kermadec) (IWC, 2001). A number of these stocks (Mozambique; Central Indian Ocean; Namibia; Chile/Peru) are known only from whaling records and have few or no recently documented sightings (IWC, 2001; NMFS, 2007). Southern right whale populations are now apparently limited to four major breeding grounds (Argentina, South Africa, Australia and New Zealand) (NMFS, 2007; Patenaude *et al.*, 2007). Based on historical whaling records and recent sightings from Southern Africa; the stocks of Namibia, South Africa and Mozambique are considered separate management units (IWC, 2001), although their exact inter-relationship is unknown.

Records of right whale catches in Mozambique are poorly documented. Townsend's charts (1935) based on the logbooks and journals of United States whaleships from 1785 to 1913, suggest that right whale catches off Delagoa Bay occurred during the months of May to September. From 1789 to 1804, a minimum of 120 voyages by American, French and British whaleships were made to Delagoa Bay (Fig. 1) in a

fishery directed at both sperm and right whales (Richards & Du Pasquier, 1989), the peak season for both being June and July (Wray & Martin, 1983). Richards & Du Pasquier (1989) noted an average catch of 20 right whales per vessel and Best and Ross (1986) estimated that at least one whale was killed and lost for every five whales landed, thus raising the average whale deaths per vessel to 25 whales. By multiplying the 120 voyages by an average of either 20 catches or 25 whale deaths per vessel, the number of right whales to have caught or killed is estimated to have been 2400 and 3000 (respectively) in the Delagoa Bay region from 1789 to 1804. This equates to average of 160 and 200 whales caught or killed (respectively) per year over the 15-year period.

Whaling continued sporadically on this ground into the mid-nineteenth century. The ship *Ann Maria* (New London), for instance, visited the bay between 21 June and 1 August 1836 and recorded the presence of another six vessels whaling there: during its stay this fleet accounted for a total of 13 whales (Penobscot Marine Museum, Seaport, Maine). The American whaling vessel *Good Return* in 1842, took a single right whale on 30th June in Sofala Bay (20°24'S; 34°31'E) and a mother-calf pair (23°45'S; 35°24'E) on 21st-22nd July (Wray and Martin, 1983¹). However by 1850 whales were apparently scarce (Wray & Martin, 1983). The single right whale taken on 30th June in Sofala Bay (Fig. 1) is the most northerly right whale capture recorded along the East African mainland, contrary to Richards (2009) who lists the most northern capture to be at Delagoa Bay.

The *Good Return* logbook notes the presence of right whale calves in Sofala Bay during the whaling season (Wray & Martin, 1983), as do the *Alliance* and *Penn* in Delagoa Bay in 1793 (Richards & Du Pasquier, 1989). Records of mother-calf pairs provide strong indication that Mozambique was a nursery ground, but the northern extent of this is unknown.

Modern whaling operations occurred in Mozambique waters from 1910 to 1915 and in 1923, during which some 3,524 whales were taken. Although many of these catches were unspecified, there were no recorded right whale catches (Best, 1994),

¹ Wray and Martin (1983) give this latter position as 25° 45'S but we have cited the position from the original log (Kendall Whaling Museum # 97, microfilm roll 9)

and further south at Durban only 27 right whales were taken in the first 22 years of modern whaling (1908- 1935).

In the absence of any current cow-calf sightings in Mozambique, the IWC (2001) suggested a population size of zero for this sub-stock. But in light of 6 sightings of 10 individuals made in Northern Kwa-Zulu Natal, South Africa (Findlay & Best, 1996) of whales heading towards Mozambique, a nominal population size of <10 mature females was tabled for Mozambique (IWC, 2001).

Here we document the first confirmed records of southern right whales (from survey data and incidental sightings) in Mozambique since the cessation of whaling. These provide evidence for the existence of a remnant Mozambique breeding stock or expansion of the South African breeding stock into its historic range. A summary of all surveys which included at least an element of dedicated cetacean observational effort within Mozambique waters (Table 1) accompanies the sighting data. We also note a southern right and humpback whale interaction that was observed on at least two days.

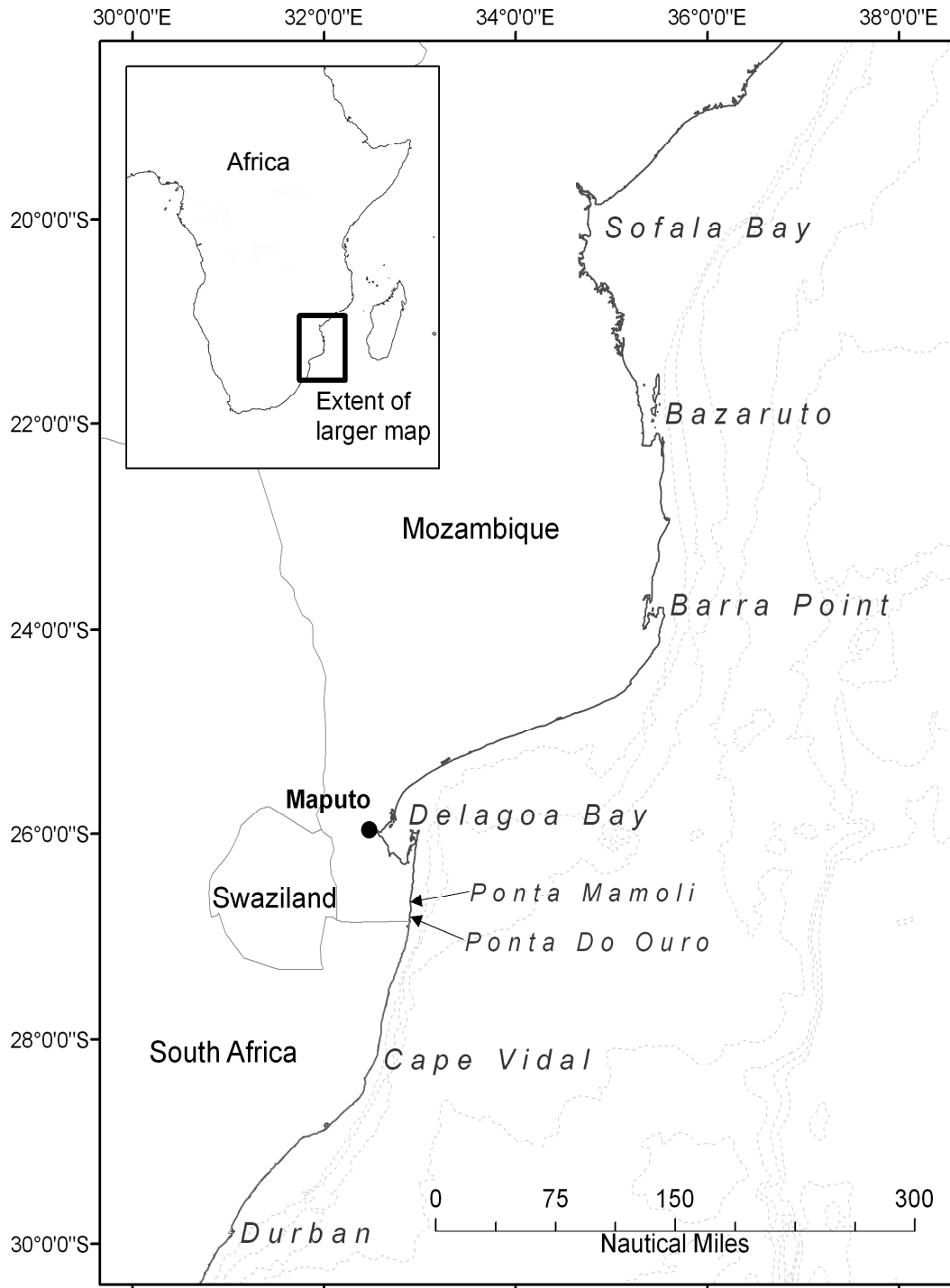


Figure 1. Survey area in Southern Mozambique and northern KwaZulu-Natal, South Africa. Historical right whale catches occurred at Durban, Delagoa Bay, and Sofala Bay, whilst recent sightings have been made at Barra Point, Ponta Mamoli, Ponta Do Ouro and Cape Vidal.

METHODS

Surveys for which a measure of effort was available are included in the survey and effort summary (Table 1). Boat-based surveys were considered to be ‘multi-day’ if the vessel was not required to return to shore at the end of each day (large survey or sailing vessels). ‘Single-day’ surveys were completed by vessels required to return to shore each day (boats <7 meters in length and range-limited). An attempt has been made to provide a measure of effort; for ‘multi-day’ boat-based surveys (Table 1), where available, this includes the total number of hours on survey effort and where known, the distance surveyed. For ‘single-day’ boat-based surveys, effort is described by trip duration and trip frequency (Table 1) and stratified by area (Fig 4 and Fig 5). Aerial surveys are described by area covered, flight speed, altitude and/or flight time/distance flown. Aerial surveys were conducted using a Cessna 182, 206 and 210 flying at an altitude between 500-100ft over inshore waters. All recent sightings of southern right whales in Mozambique (n = 10) were classified following the protocol used by Roux *et al.* (2001) whereby sightings are rated as doubtful, possible, probable or confirmed (Table 2). Allocation of each category was based on the experience of the observers, conditions of the sighting (distance and visibility) and the supporting evidence provided (notes, sketches, photographs and video footage).

RESULTS

Effort for ‘single-day’ boat-based cetacean surveys increased overall from 1995 to 2009 with a peak in 2007 of just over 700 hours (Fig 4). Intra-annual ‘single-day’ boat-based effort was lowest in February and highest in December, of which a large proportion took place at Ponta Do Oura and Ponta Mamoli (Fig 5). Multi-day surveys (Table 1) occurred at a greater distance from shore than ‘single-day’ surveys and consisted of two humpback whale line transect surveys (1991 - 25° 58’ S; to 18° 00’ S and 2003 - 26° 00’ S to 14° 26’ S) and a fisheries survey that had limited cetacean survey effort but completed four complete coverage’s of the Mozambique coast (10° 30’ S to 26° 50’ S) between 1977-1978. Sightings of right whales during these ‘multi-day’ surveys may have been less likely due to the distance at which they were conducted from shore and so comparing sightings with ‘multi-day’ survey effort should be regarded with caution.

No sightings of right whales were made during ‘multi-day’ or aerial surveys. Of the 10 sightings (Table 2), five sightings were considered to be “confirmed” and five were considered to be “probable”. Seven sightings were made inshore or from land between Ponta Do Ouro and just north of Ponta Mamoli (26°50’S to 26°35’S) (Fig. 1, Table 2). Three incidental inshore sightings were made off Barra Point, Inhambane (23°47’S - 35°32’E) (Fig. 1, Table 2). The maximum distance from the coast of any sighting was 900 meters. Although the highest frequency of sightings occurred in 2009 (Fig. 2), this increase is most likely attributed to increasing search effort through dedicated surveys or increased tourism activities such as scuba diving, whale and dolphin watching and ‘swim-with’ operators within inshore waters at Ponta Do Ouro, Ponta Mamoli and Inhambane. Six sightings were incidental and four sightings were made during dedicated cetacean survey effort. Sightings only occurred during August and September (Fig. 3) even though survey effort extended outside of these two months (Table 1, Fig 5). This differs from the historical right whale records from Sofala Bay, which occurred during June and July (Wray & Martin, 1983) and the extensive catches illustrated by Townsend (1935) between May and September. The mean date was calculated for all sightings (n=10) using the exact date (n=8) or where this was unknown, the mean date within the approximate date range was used (n=2). The inclusion of one possible re-sighting at Barra Point, Inhambane (table 2) gave a mean sighting date of 2 September (SD=14 days, n=10) whilst its exclusion produced a mean sighting date of 1 September (SD=15 days, n=9). Where data on age class (adult/juveniles/calves) and group size were recorded for sightings and excluding the possible re-sighting, adults (n=4) were sighted most frequently, followed by juveniles (n=3). Only one calf was seen.

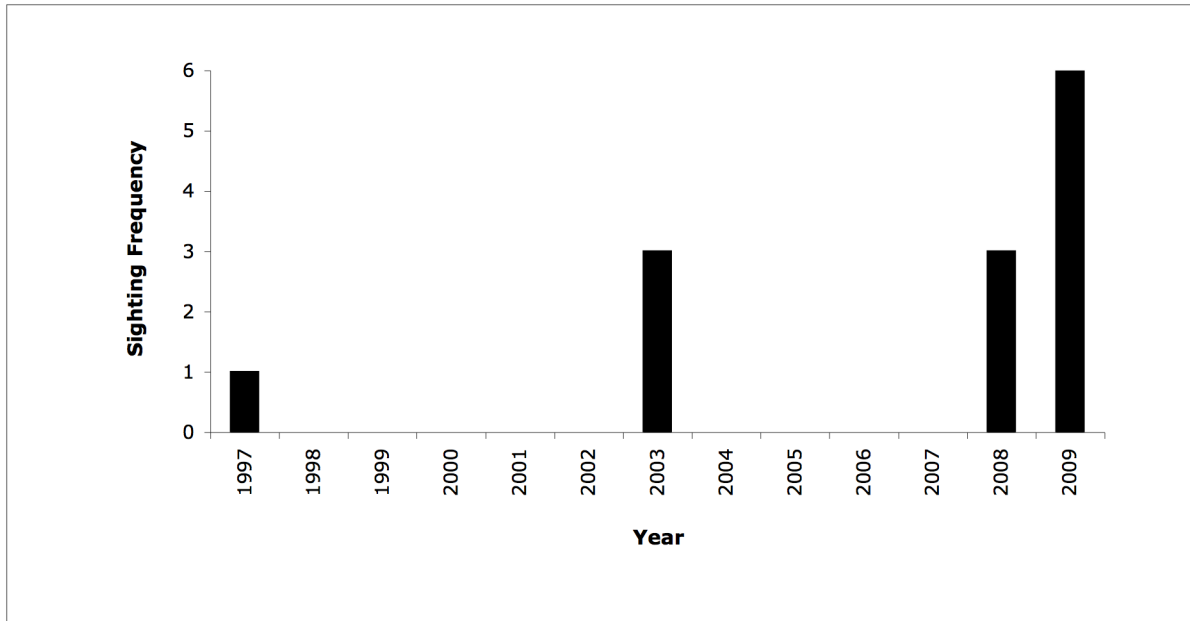


Figure 2. Frequency of southern right whale sightings in Mozambique between 1997 and 2009 without adjustment for effort.

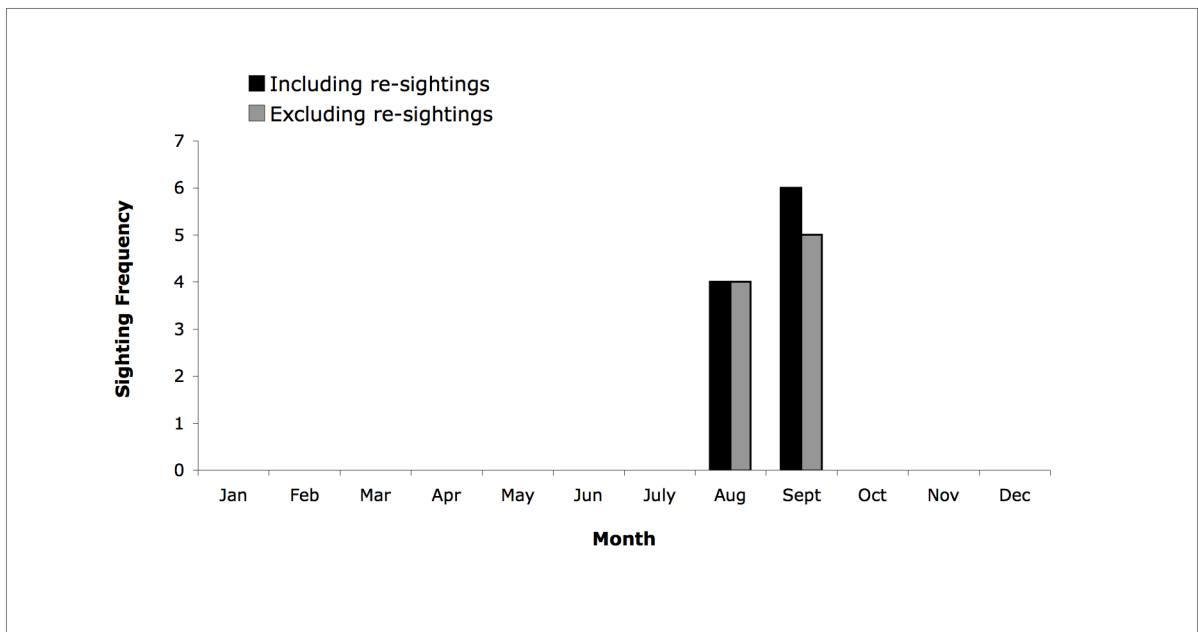


Figure 3. Seasonality of all southern right whale sightings, including and excluding confirmed re-sightings, in Mozambique (1997-2009) without adjustment for effort.

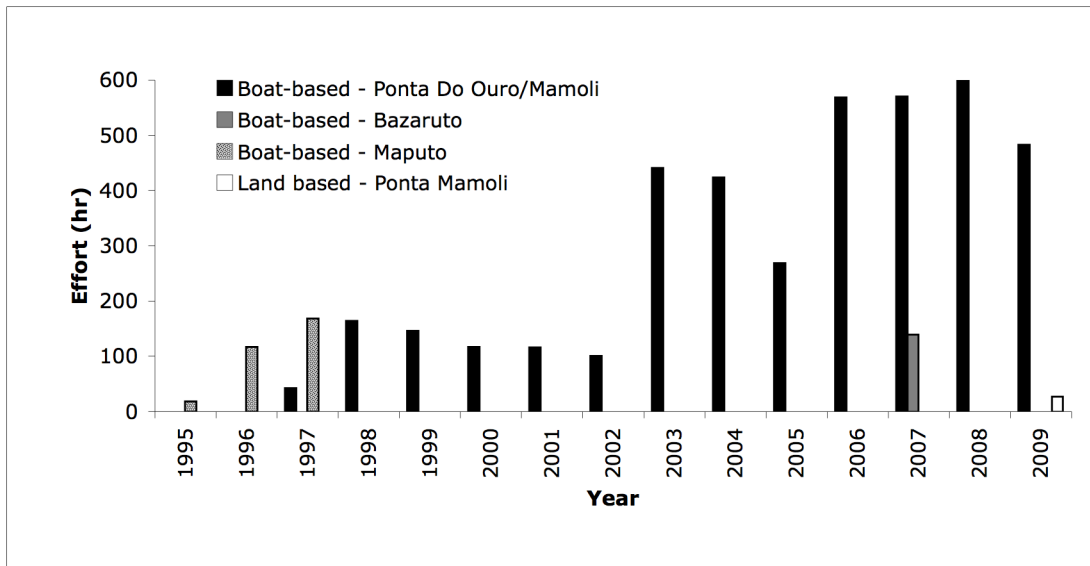


Figure 4. 'Single-day' boat-based and land-based effort per year stratified by area for Ponta Do Ouro/Ponta Mamoli (combined due to their immediate proximity) Maputo and Bazaruto Archipelago, Mozambique, 1995-2009. Effort = hours of sea time or land-based observations.

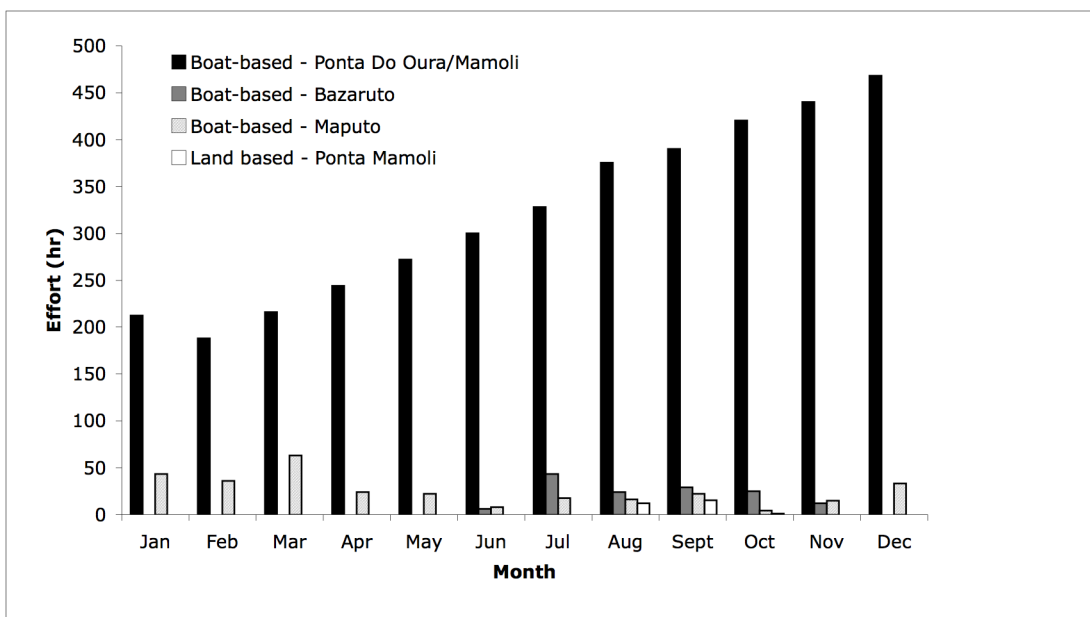


Figure 5. 'Single-day' boat-based and land-based effort stratified by area per month for Ponta Do Ouro/Ponta Mamoli (combined due to their immediate proximity) Maputo and Bazaruto Archipelago, Mozambique, 1995-2009. Effort = hours of sea time or land-based observations.

Excluding one possible re-sighting ($n=1$), groups were of either one individual ($n=6$) or pairs ($n=3$). The first sighted pair consisted of two adults whilst the second was of a mother-calf pair. A mixed species group consisting of a southern right whale and

a humpback whale were sighted on a number of occasions on at least two days (see below). One of the single juveniles was a brindie southern right whale (= grey morph, Schaeff *et al.*, 1999). Indo-Pacific bottlenose dolphins (*Tursiops aduncus*) were also observed on two occasions swimming with southern right whales. The behaviour and predominant direction of travel was available in the majority of cases (n=8); one sighting was described as 'resting', two sightings were described as 'milling' and five sightings were described as traveling. All traveling groups were traveling in a southbound direction.

Re-sightings and humpback whale interaction

It is possible that a sighting of two southern right whales on 26 August 2009 at Barra Point, Inhambane, was a re-sighting of a previous sighting of two southern right whales made in the same area between 14-21 August 2009 (exact date unknown) (Table 2). However, this cannot be confirmed either way as no photographs were taken of either sighting. On at least two days in early September 2003, a number of sightings were made of a mixed species group consisting of one adult southern right and one adult humpback whale was observed in shallow water (<10m) at Ponta Do Ouro. During the sightings, the two animals were observed slowly milling around in the area together, or indulging in increased social interaction with rolling, waving of pectoral fins, fluking and breaching. Underwater photographs of the interaction taken by A. Gullan also revealed a protrusion of what was taken at the time to be the right whale's penis: subsequent inspection of photographs however revealed that this was more likely to be a prolapsed uterus (Plate 1). The humpback whale was not observed from underwater and no determination of its sex was made. Indo-Pacific bottlenose dolphins were also observed on at least one occasion with the mixed species group. After the examination of photographs the humpback whale appeared to be the same individual observed on different days whilst for the right whale, this remains unconfirmed. It should be noted that Table 2 records this mixed species group, which occurred on at least two days, as a single entry due to uncertainty regarding the exact dates and number of sightings.



Plate1. Underwater view of the southern right whale with possible prolapsed uterus (right) and tail fluke (left) during its interaction with a humpback whale. Photograph: Angie Gullan.

DISCUSSION

The existence of a Mozambican right whale sub-stock is recognised by the IWC (IWC, 2001), although this recognition stems from historical catch data alone. The five confirmed and five probable sightings reported in this paper provide the first clear evidence for the existence of southern right whales utilizing the coastal waters of Mozambique since the cessation of whaling. Moreover the majority of recent sightings have occurred in the last 10 years of which half occurred during 2009. However, survey effort has increased considerably during the last ten years (Fig 4) and the increase in sightings is likely to be due to this. Naive observers or those not expecting to sight southern right whales in Mozambique waters could fail to detect or recognize southern right whales, particularly when humpback whales are also very abundant. Although this could account for low numbers of incidental sightings from non-cetacean specialists, it would not account for low sightings during extensive cetacean survey effort (boat based, land based and aerial) using experienced observers. All of the current right whale sightings in Mozambique were made within 900 meters from the coast. This is consistent with the reported offshore distribution

of southern right whales in South Africa (Best, 1990), where 90% of sightings occurred within 1.85 km from the coast. Best (1990) also noted that some right whales were seen up to 9.63 km from the coast. The lack of right whale sightings during the ‘multi-day’ surveys could well be a due to disparity between offshore effort coverage and right whale distribution where the offshore effort primarily occurred beyond the offshore range of right whales.

It is difficult to establish if these animals are a remnant population or represent a range expansion of the South African sub-stock. The complete lack of records from Mozambique until the late 1990s could well be due in part to limited survey effort confined to Maputo Bay or areas further offshore (Table 1). During a land-based survey of humpback whale migration at Cape Vidal between 1988-1991 (Fig. 1), Findlay and Best (1996) recorded six southern right sightings totaling ten individuals. These animals were recorded traveling both northbound and southbound and sighting dates are consistent with those recently recorded in Mozambique. It is not unreasonable to consider that those observed by Findlay and Best (1996) may have been migrating to and from Mozambique from the South African sub-stock. Best and Ross (1986) note the possibility of a range retraction as a result of extensive whaling. It would follow that a recovering population might expand back into its historical range and that the sightings at Cape Vidal between 1988-1991 (Findlay & Best, 1996) were the first evidence of this repopulating expansion. No genetic information is available from any of these sightings and no photo-identification matches have yet been attempted with other catalogues. However, Rosenbaum *et al.* (2001), found that the maternal lineage haplotype from one individual sampled in Madagascar matched one of the two most common haplotypes found only in the South Atlantic Ocean, providing some evidence of common ancestry. The greater proximity of Mozambique would suggest even readier ‘overflow’ for southern rights from the growing South African population. Alternatively, these recent sightings could be of a remnant population, which due to their extremely low numbers have remained largely undetected until the recent increase in survey effort in the near-shore regions of the Mozambique coast.

Roux *et al.* (2001) reviewed sightings of southern rights along the coast of Namibia between 1971 and 1999. The seasonal distribution of sightings (June to December)

was wider than those reported here for Mozambique. Interestingly though, the mean sighting date of the Namibian population was 4 September (SD=45 days, n=36). This peak compares very closely with the recent Mozambique sightings reported here, and is similar to the south coast of South Africa, where whales reach a peak in September (Best & Scott, 1993) or September/October (Best, 1981).

Individual movements can differ radically from the generalized distributions of their origin stock (Best *et al.*, 1993; Mate *et al.*, 1997; Rowntree *et al.*, 2001). Male southern right whales have been found to display significantly less site fidelity than females (Burnell, 2001). Within-year movements of southern right whales during their breeding season have also shown that movements over large distances are not uncommon (Burnell, 2001). Burnell (2001) documented 18 within-year movements ranging from 211-1,490km, made over periods of 3-59 days. The longest within-year distance of 1,490km was in fact made by a female in less than 41 days and in a Southern African context, Southern Mozambique would be within range for such a within-year movement by a South African southern right whale. It is also possible that southern right whale(s) join (or follow) humpback whales to and from their Mozambique breeding grounds as the migration of East African humpback whales coincides with the occurrence of southern right whales on their South African breeding grounds. The presence of coronuline barnacles on a right whale have also been taken as possible evidence of visitation by an adult female right whale to a humpback breeding ground (Best, 1991).

Interspecies associations have been documented for a variety of cetacean species (Baird, 2002; Herzog *et al.*, 2003; Rossi-Santos *et al.*, 2009; Willis *et al.*, 2004). However, these interactions typically involve odontocetes and are often associated with foraging, cooperation or aggression (Rossi-Santos *et al.*, 2009). Whilst hybrids of mysticetes are known to have been taken through commercial whaling operations (Arnason *et al.*, 1991; Berube & Aguilar, 1998), observations of interactions between mysticetes are less frequently documented. However, interactions between southern right whales and humpback whales are known to occur. In Hawaii, Salden and Mickelsen (1999) describe how a North Pacific right whale appeared to initiate a social interaction with a group of humpback whales. Sekiguchi *et al.* (2010) describe an interaction between a southern right and humpback whale in Antarctica (64°31'S -

107°58'E) and on several occasions southern right and humpback whales have been seen traveling together in South African waters (including one of the sightings from Cape Vidal). The nature of the interactions in the present instance is unknown, but is unlikely to be sexual given the patently non-functional condition of the female right whale.

Whaling records show that Sofala Bay and Delagoa Bay were known areas of southern right whale concentrations in winter, and these locations are consistent with the direction of travel observed in this study. Sighting data from Ponta Do Ouro (26°53'S) and Ponta Mamoli (26°42'S) show a southerly direction for all groups recorded traveling. This suggests that those whales were ranging further north from where they were sighted which is also consistent with the three "probable" sightings from Barra Point, Inhambane (23°47' S), approximately half way between Ponto Do Ouro and Sofala Bay. Although no recent sightings have been made north of Barra Point, Inhambane, it is reasonable to suggest that in light of historic whaling at Sofala Bay, right whales might be found at least 225 nautical miles further north of Barra Point, Inhambane.

Threats

Although current estimates of population size are lacking, exceptionally low sighting rates despite increased effort using a variety of survey platforms, suggest that the abundance of southern rights in Mozambique is very low. This suggestion of low abundance in turn raises concern about the effects of possible anthropogenic threats. Right whale injury and mortality due to ship strike and entanglement in fishing gear can be serious problems when populations are small (IWC, 2001; Johnson *et al.*, 2005; Knowlton & Kraus, 2001; Moore, 2009; Nowacek *et al.*, 2004). The use of coastal gill nets and long lines along the Mozambique coast also poses a potential entanglement threat for southern right whales utilizing inshore waters. There are no specific management plans in Mozambique which deal solely with whales. However, generic protection is offered by the Coastal Zone Management Strategy, Fisheries Law and Regulations and the Forest and Wildlife Law, which list whales and dolphins as species which cannot be exploited or killed. In light of this new information regarding the presence of southern right whales off the coast of Mozambique, we recommend that management plans be revised and updated to include and consider

the seasonal occurrence of southern right whales within the inshore waters of southern Mozambique. Recommendations should include measures to control disturbance from boat traffic and fishing and to prevent critical habitat degradation. Further surveys are now required to determine the overall distribution and numbers of right whales frequenting the coast of Mozambique. Genetic and photo-identification information should also be acquired to determine the identity of the right whales off Mozambique and their inter-relationship with other southern right whale populations.

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Table 1. Summary of surveys and associated effort where cetacean observations have taken place in Mozambique between 1977-2009

Year	Survey Type	Description	Effort/Coverage	Southern right whale sighting
1977-1978	Boat-based (Multi-day)	Fisheries survey, Mozambique. ¹ Vessel: 46m combined stern trawler/ purse seinern R/V “ <i>Dr.Fridtjof Nansen</i> ”. Date: 24 Aug 1977-20 Jun 1978. Limited cetacean survey conducted.	Four complete coverage’s of the whole Mozambique coast (10° 30’S to 26° 50’S).	None
1991	Boat-based (Multi-day)	Humpback whale line transect survey, Southern Mozambique. ² Vessel: 20m ketch yacht “ <i>Zanj</i> ”. Date: 15 Aug-15 Sept 1991	630 nautical miles steamed on effort in coastal waters of Mozambique between Maputo (25° 58’S) and 18° 00’S. Three leg return trip.	None
1995-1997	Boat-based (Single-day)	Bottlenose and humpback dolphin survey, Maputo (Delagoa) Bay, Mozambique. ³ Vessels: 4.5m R.I.B. and 9m fiberglass boat. Throughout 1995-1997.	146 trips totaling 302 hours of sea time. Survey area within Maputo (Delagoa) Bay (26°S; 32°E)	None
1997	Aerial	Southern Mozambique whale shark surveys. ⁴ Aircraft: Cessna 182. Date: Jun, Aug, Oct, Nov 1997	Flight speed and altitude: 70-80knts and 500-1000 ft. 9 coastal flights between Maputo (25°58’S; 32° 34’E) and Ponto do Ouro (26° 50’S; 32° 50’E), 1 flight within Maputo (Delagoa) Bay only. Approx 70 Nm/flight.	None
2003	Boat-based (Multi-day)	Cetacean line-transect survey, Mozambique. ⁵ Vessel: FRS Algoa. Date: 26 Aug-27 Sept 2003.	952 nautical miles of search effort between Cabo Inhaca (26° 00’ S; 33° 05’ E) and the north of Mozambique Island (14° 26’ S; 40° 53’ E) between the 20 and 200 m isobaths.	None
1997-2009	Boat-based (Single-day)	Inshore dolphin encounter surveys as part of “DolphinCare-Africa / EnCOuntours” ecotourism operation, Ponto do Ouro, Mozambique. ⁶	2669 trips totaling 4004 hours (1.5hr/trip). Inshore waters of Ponta do Ouro. (26° 50’S; 32° 50’E)	Six sightings Six individuals
2007	Boat-based (Single-day)	Dugong and humpback whale surveys, Bazaruto Archipelago, Mozambique. ⁷ Vessel: 6m R.I.B. Date: Jun-Nov 2007.	85 trips totaling 469 hours of sea time. Survey Area extended 16 nautical miles north and 10 nautical miles east of Bazaruto Island (21° 30’S; 35° 28’E).	None

2007	Aerial	Dugong distribution and abundance surveys, Bazaruto Archipelago, Mozambique. ⁸ Aircraft: Cessna 210, Cessna 182 and Cessna185. Date: Apr 2006-Nov 2007.	Flight speed and altitude: 80knts and 150m. 27 Line transect Flights between Save River and Sao Sebastiao, Bazaruto Archipelago between 0 and 20m isobaths. 135 Hours, covering 9052 miles, mean 5.0 hour/flight	None
2008	Aerial	WWF Dugong distribution and abundance surveys, Bazaruto Archipelago, Mozambique. ⁹ Aircraft: Cessna 206. Date: 25-29 May 2008.	3 surveys totaling 10.57 hours between Bartolomeu Dias and Sao Sebastiao Peninsula, Bazaruto Area.	None
2009	Land-based	Humpback whale survey, Ponta Mamoli, Mozambique. ¹⁰ Date: Aug-Sept 2009.	17 surveys totaling 26.5 hours of observation time. Ponta mamoli, Mozambique (26° 42'S; 32° 54'E)	One sighting One individual
2009	Boat-based (Single-day)	Humpback whale survey, Ponta Mamoli, Mozambique. ¹¹ Vessel: 6m R.I.B. Date: Aug-Oct 2009.	13 trips totaling 34 hours of sea time. Survey area extended approximately 10 nautical miles north and offshore of Ponta Mamoli (26° 42'S; 32° 54'E).	None
2009	Aerial	Marine mammal survey, northern Mozambique. ¹² Aircraft: Cessna 206. Date: 24-25 Nov 2009.	Flight speed and altitude: 80knts and 150m. 2 surveys consisting of 8 east-west transects between the coast and 1500m isobath, totaling 6.48 hours of flight time between Pemba and Memba plus a north-south coastal flight.	None

¹ Saetre, R. and R. de Paula e Silva. (1979).

² Findlay, K.P. *et al.* (1994).

³ Guissamulo, A. T. (2008). Ecological Investigations of Bottlenose and Humpback Dolphins in Maputo Bay, Southern Mozambique. PhD Thesis.

⁴ Killian, C. Unpublished data.

⁵ Findlay, K.P. *et al.* (2003).

⁶ Gullan, A. "*DolphinCare-Africa / EnCOuntours*" *Ponto do Ouro, Mozambique*. Unpublished data.

⁷ Banks, A. Unpublished data.

⁸ Cockcroft, V.G., Findlay, K.P., Guissamulo, A., Banks, A. (2007). Dugong aerial surveys, Bazaruto Archipelago. Unpublished data.

⁹ WWF (2008) Dugong Aerial Survey Report . May 25-29, 2008. Bazaruto Archipelago National Park Inhambane Province, Mozambique. 29p.

¹⁰ Banks, A. Unpublished data.

¹¹ Banks, A. Unpublished data.

¹² Guissamulo, A.T. Unpublished data.

Table 2. Sightings of southern right whales in Mozambique 1977-2009. Key: Juv.=Juvenile; Ad.=Adult; M-C=Mother Calf Pair; P=Probable; C=Confirmed. SRW=southern right whale, HBW=humpback whale, BND=bottlenose dolphin. * Exact date uncertain. ** Possible re-sighting. ^Multiple sightings on at least two days.

Date	Location	Lat (S)	Long (E)	Platform	Group Size	Group Composition	Mixed Species Group	Behaviour	Direction of Travel	Depth (m)	Substrate	Class
20 Sept, 1997	Ponta Do Ouro	26° 49' 00'' (Approx location)	32° 53' 00'' (Approx location)	Boat (Incidental)	1	Juv. ♂ (Brindle)	n/a	Milling	n/a	6m	Sand & Reef	C
2-12 Sept, 2003*^	Ponta Do Ouro/Ponta Malongane	26° 48' – 26° 50'	32° 53' – 32° 54'	Boat (Single-day)	1	Ad.♀	SRW - (prolapsed uterus) HBW BND	Milling	n/a	7-10m	Sand & Reef	C
30 Aug, 2008	Barra Point, Inhambane	23° 47' 00'' (Approx. location)	35° 32' 00'' (Approx. location)	Boat Incidental	1		n/a			<20m	Sand & Reef	P
18 Sept, 2008	Ponta Do Ouro	26° 49' 6.7''	32° 53' 40.4''	Boat (Single-day)	2	Ad.-Ad.	n/a	Travel	South	>10m	Sand	C
13 Aug, 2009	Ponta Do Ouro	26° 50' 8.3''	32° 53' 31.8''	Land based Incidental	2	M♀-C	n/a	Travel	South	5-10m	Sand	P
16 Aug, 2009	Ponta Madajanine	26° 44' 6.6''	32° 54' 16.9''	Boat (Single-day)	1		n/a	Travel	South	5-10m	Sand	P
14-21 Aug, 2009*	Barra Point, Inhambane	23° 47' 00'' (Approx. location)	35° 32' 00'' (Approx. location)	Boat Incidental	2		n/a	Resting	n/a	<20	Sand & Reef	P
26 Aug-10 Sept, 2009**	Barra Point, Inhambane	23° 47' 00'' (Approx. location)	35° 32' 00'' (Approx. location)	Boat Incidental	2		n/a			>20	Sand & Reef	P
4 Sept, 2009	Ponta Mamoli	26° 35' 8.1''	32° 54' 49.4''	Boat Incidental	1	Juv.	n/a	Travel	South	>10m	Sand	C
16 Sept, 2009	Ponta Mamoli	26° 42' 5.2''	32° 54' 23.4''	Land based	1	Juv.	SRW BND	Travel	South	5-10m	Sand & Reef	C