2018 ≈ REPORT

DolphinCareAfrica t/a. DolphinEncountours.org

PONTA DO OURO PARTIAL MARINE RESERVE - MOZAMBIQUE

Forward

DolphinCareAfrica t/a Dolphin Encountours Research Center DERC is an organisation that was formerly created in 1998. We are dedicated to the protection and long-term monitoring of the local Dolphins of Ponta coupled with sharing the wonder of them with visitors to the Ponta do Ouro Partial Marine Reserve in Mozambique.

Over the past two decades we have pioneered the way in ethical and responsible marine mammal tourism and have established ourselves as leaders in the African field. Our history is steeped in many delightful and interesting tales that have moulded us into the essence of who we are today. Following and documenting the fascinating lives of the resident Dolphins of Ponta, sentient, non-human persons I call the people of the sea has been an honour and certainly a life choice I am most grateful for. This naturally lead to the creation of a citizen science project that has grown to include the Dolphins of Ponta Id Project, a stranding and skeleton project and the DolphinCare Database which holds many 1000's of stored archive entries, images and videos of resident dolphins residing in the southern most bays of Mozambique.

The Reserve is a hotspot for dolphin swim tourism now and as the activity gains more popularity as access via a tar road is made easier, the environment is changing for our finned friends. As I sit on land - I feel and hear the busyness. This is mirrored in our waters as marine based tourism increases and beachfront developments materialise. The coastal shallows are an important area for dolphins who are regularly seen nursing their young, socialising, foraging and resting. Collectively we need to acknowledge this home and implement measures to ensure effective management of human impacts on our local dolphins.

For the Love of Dolphins

Angie Gullan
Founder Citizen Scientist

Cover Image: Bottlenose dolphin D Cremildo
Forward image: Spinner dolphin D Cremildo

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MARINE MAMMAL SIGHTINGS IN THE PONTA DO OURO PARTIAL MARINE RESERVE - MOZAMBIQUE 2018

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INTRODUCTION

This report has been produced by DolphinCareAfrica t/a Dolphin Encountours Research Center (DERC) with the financial support of The German Dolphin Conservation Society and participants of cetacean based tourism activities; namely dolphin and whale viewing (Berggren, 2007) and volunteer programmes. Its purpose is to present the project's activities and achievements throughout 2018. It presents and provides an overview of the organisation's research effort and broader activities that are related to cetaceans (marine mammals including dolphins and whales) and their environment. It focuses on the southernmost bays of Mozambique, namely Ponta do Ouro, Malongane, Madajanine and to a lesser degree Mamoli and further north. All of which are situated in the Ponta do Ouro Partial Marine Reserve which borders the iSimangaliso World Heritage Site of South Africa. The report documents the at sea observations of marine mammals undertaken between January and December of 2018 during commercial cetacean-based tourism activities that follow an ethical and responsible code of conduct (Annex 2). It takes a species specific look at Mozambique's coastal, cross border dolphins, namely the Indo-Pacific bottlenose (Tursiops aduncus) and the endangered Indian Ocean humpback (Sousa plumbea) dolphin who are exposed to tourism activities. It is intended to show our ongoing commitment and dedication to ethical and responsible tourism, research and conservation in Mozambique as per the MOU with National Administration for Conservation Areas – ANAC. The project is long-term, on-going and documents the life history of resident bottlenose and humpback dolphins in the coastal waters.

Figure 1: Bottlenose & Humpback dolphin Herme together

LOCATION

DERC is located in Ponta do Ouro, the southernmost town in Mozambique that borders South Africa. It is situated 120km south of the major city of Maputo and is now accessible by means of a tar road (Bjerner & Johansson, 2001). November of 2018 marked the opening of the Maputo-Catembe bridge, which is now the longest suspension bridge in Africa and the development also connects Ponta do Ouro to Maputo by means of a tar road; that extends to the South African border just south of Ponta do Ouro (En.wikipedia.org, 2019).

DERC operates from within the Ponta do Ouro Partial Marine Reserve, which starts from PDO and extends past Inhaca Island into Maputo Bay (ANAC, 2017). The PPMR covers an impressive 678 square-kilometres, starting from the high-water mark and extending 3 nautical miles (5.5km) out into the Indian Ocean (ANAC, 2017). The PPMR was proclaimed in 2009 and the Management Plan was approved in 2011 (ANAC, 2017). The reserve is partial because it includes a complete sanctuary area, restricted zones as well as multi-use activity zones (DNAC, 2011).

Figure 2: PPMR map with area traveled during tourism activities and closed off sanctuary area's indicated in red.

Annex 1 shows the code of conduct presented in the PPMR Management Plan that was initially a voluntary code developed by DERC and that is now mandatory for all CBT operators in the area (DNAC, 2011; Rocha, 2017). The Reserve borders the iSimangaliso Wetland Park of South Africa, a World Heritage Site, to the south and forms part of the first transfrontier conservation area in Africa (Peace Parks Foundation, 2019). It is included in of the Lubombo Transfrontier Conservation and Resource Area as the Ponta do Ouro-Kosi Bay Transfrontier Conservation Area (Peace Parks Foundation, 2019). 2018 saw Peace Parks Foundation signing an agreement with ANAC (Mozambique's National Administration of Conservation Areas) to further develop both the PPMR and the Maputo Special Reserve.

METHODOLOGY

While undertaking cetacean-based tourism activities in the PPMR, data is collected on a standard recording sheet developed by DERC on-board the vessel Avalon MPT 9649AC, an 8 meter semi-rigid dive boat with 2 x 90hp four stroke Mercury engines.

When the boat departs for the tour a launch time is recorded. The boat then proceeds to start looking for marine mammals traveling at a speed of ±25km p/hour. The route of travel is decided upon by the skipper who takes into consideration the sea surface conditions, previous launch sightings and other operator presence. Once a sighting is had, the boat slows and approaches from the side and keeps an average distance of ±100m unless the dolphins actively approach the boat to bow-ride.

A trained guide/volunteer completes a sheet that includes environmental, location and sighting data with times, species, group composition, estimated pod size, behaviour, in-water attempts and encounter class. During this time, and while participants are in-water, top water images are captured with focus on dorsal fins for the ID project; mothers and calves, male alliances and lesions. Once complete the observation is timed out and finally when the boat returns to shore the launch is timed out. Once back on land data is entered onto the electronic data sheet from the physical data collected at sea. Images and videos are downloaded and archived by date, time, individual/s and behaviour.

To analyse data, 2018 entries were extracted from the main data sheet and charts within google sheets used to analyse data.

Figure 3: DERC vessel. 8m Semi-ridged named Avalon with two engines with a maximum carrying capacity of 16.

ACTIVITIES AND RESULTS

During the period from 01 January to 31 December 2018 a total number of 282 launches were undertaken from Ponta do Ouro by DERC (Figure 4). The effort yielded 453 sightings that included four species of dolphins and three species of whales (see Table 1). A total of 360hrs were spent at sea looking for marine mammals which found 121hrs of observations of dolphins and whales.

Comparing number of launches from 2010 to 2018 to number of dolphins observed while undertaking CBT, it is evident that DERC has had a decrease in Bottlenose dolphin sightings over the last eight years. However, there has been an increase in sightings this year compared to 2017, where last year saw less launches and less dolphins (Figure 4). 2014 marks the year with the least sightings and also the year where there are fewer sightings than number of launches.

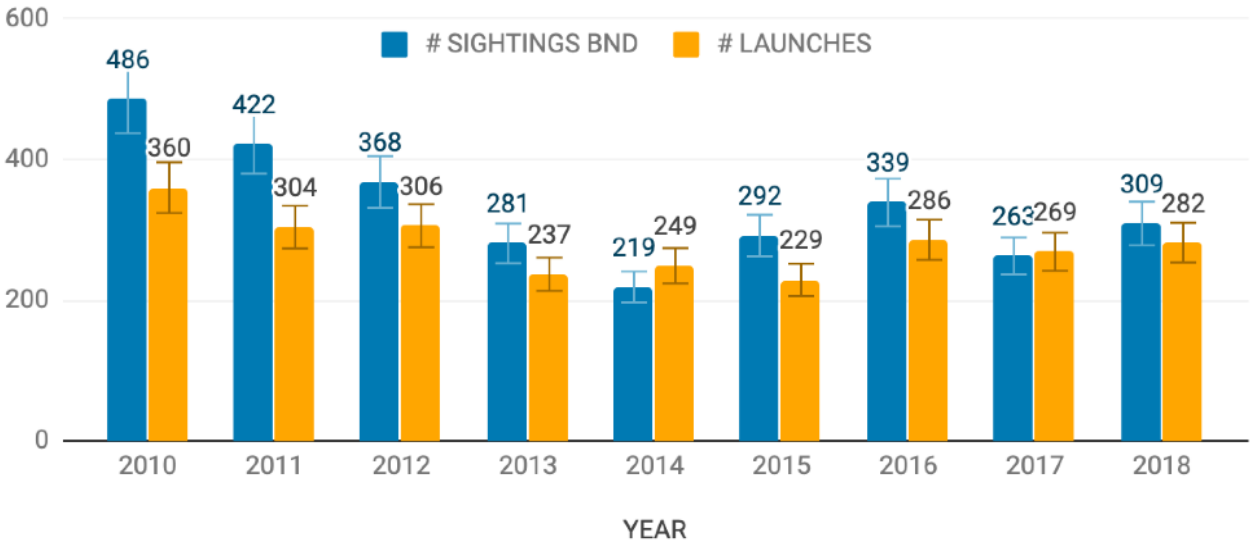


Figure 4: Bottlenose dolphin sightings compared to launches 2010 to 2018

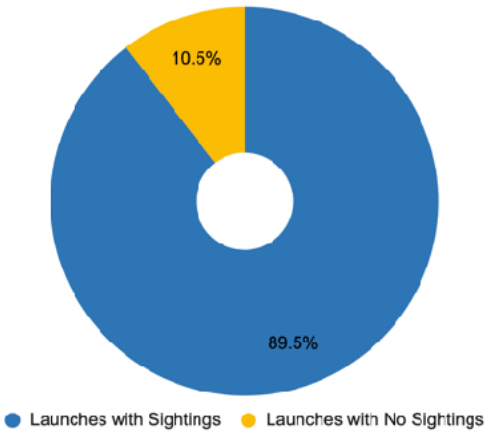


Figure 5: Launches with & without sightings 2018

Launches where no sighting were had of any marine mammals were recorded and found to be 10.5% indicating an 89.5% success rate on seeing marine mammals while undertaking cetacean-based tourism activities (Figure 5). For 179 days in 2018 DERC did not launch the boat for cetacean based tourism activities, the breakdown is shown in Figure 6. Most notably on 101 days there was no launch because of bad weather/sea state, whereas on 75 days it was because there weren't enough participants to cover launching costs.

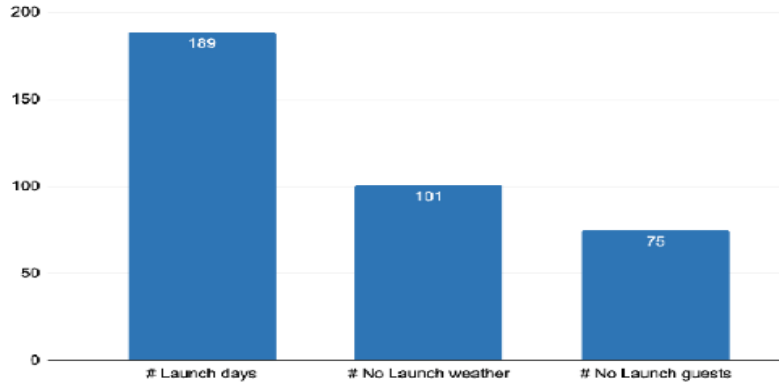


Figure 6: Chart with launches and breakdown of no launches for 2018

During this time ±24 000 unedited images were archived and 145 in-water events were recorded. Of this 5 600 images were extracted, edited and saved by date, time, species/individual (when possible) and behaviour or other special interest.

A collaboration with HappyWhale (state of the art image processing algorithms to match whale photos for global whale tracking) found us spending the latter part of the year uploading humpback whale fluke images. This resulted in 40 usable fluke images for identification purposes. 2018 marked our first confirmed HappyWhale re-sighting of a humpback whale from the previous migratory season.

The Big MicroPlastic Survey Project and IndoCet were other partnerships formed. DERC has continued to support the PDO Turtle Project and partially managed and funded salaries of three monitors between the months of October and March.

Figure 7: Right, the sorting & documenting of micro plastic in the PPMR. Image DERC

Figure 8: Micro plastic collection by DolphinCare Volunteers. Lead by coordinator Sabrina Sykes Images: DERC

1: Marine Mammal and Megafauna Recorded During 2018

Indo-Pacific Bottlenose were the most frequently sighted cetacean species (309 sightings) in the reserve, with sightings occurring throughout the year, followed by humpback whales (117 sightings). Table 1 below indicates the sightings list had in the PPMR of marine mammals and megafauna between 2010 and 2018 by DERC. In sightings where species were observed together i.e. spotted and spinner dolphins, each species is entered as a separate entry.

Table 1: Breakdown of sightings

MARINE MAMMAL, WHALESHARK AND MANTA RAY SIGHTINGS PPMR 2010-2018									
YEAR ➤	2010	2011	2012	2013	2014	2015	2016	2017	2018
Bottlenose Dolphin	486	422	368	281	219	292	339	263	309
Humpback Dolphin	36	55	43	12	28	28	36	14	22
Spinner Dolphin	1	4	4	7	7	8	17	16	14
Spotted Dolphin	3	6	10	3	3	10	13	11	4
Humpback Whale	40	87	54	59	91	79	74	123	117
S.Right Whale	0	2	0	0	0	0	0	1	1
Pygmy Killer Whale	0	0	0	0	0	0	0	0	1
Manta Ray	2	6	8	2	5	8	8	2	2
Whale Shark	46	18	10	0	7	5	3	1	1

Since 2010 there has been a drop off in the number of launches per year (Figure 11). Data was plotted onto a line chart to get an idea of trend on species encountered. The bottlenose dolphin is still the most frequently encountered species, however, observations have decreased on a whole and more research is needed to confirm if this is due to weather and drop in launches or if the decline is in fact caused by an increase in tourism activity driving the resident population out of the area.

Figure 9: Local dolphin DPec with damaged fin caused from fishing line entanglement. Image: DERC

Figure 10: Local dolphin Blossom with damaged rostrum cause unknown. Image: DERC

Humpback whale sightings have increased considerably since 2010, with the last two years showing sightings within the hundreds, these are three times higher than the 2010 numbers (see Table 1 and Figure 11).

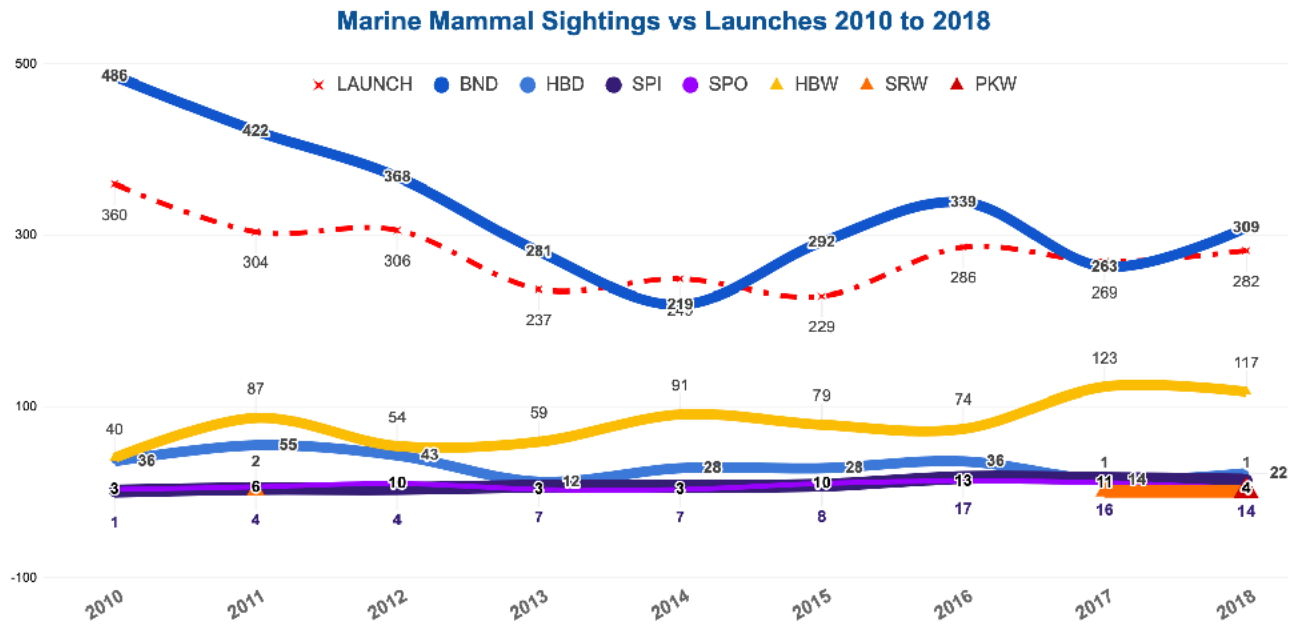


Figure 11: Marine Mammal sightings vs launches 2010-2018

Figure 12 shows the probability of seeing a bottlenose dolphin per launch, it excludes repeat sightings during one boat excursion. It thus, serves as an indicator for the overall chances of seeing a bottlenose dolphin, a question that is on the tip of every eager cetacean-based tourist's tongue upon arrival at our Center. Working with cetaceans in the wild means that we are unable to guarantee sightings therefore, this statistic is vital in not only informing clients of our sighting success-rate but also in showing the yearly fluctuation in likelihood of bottlenose dolphins sightings.

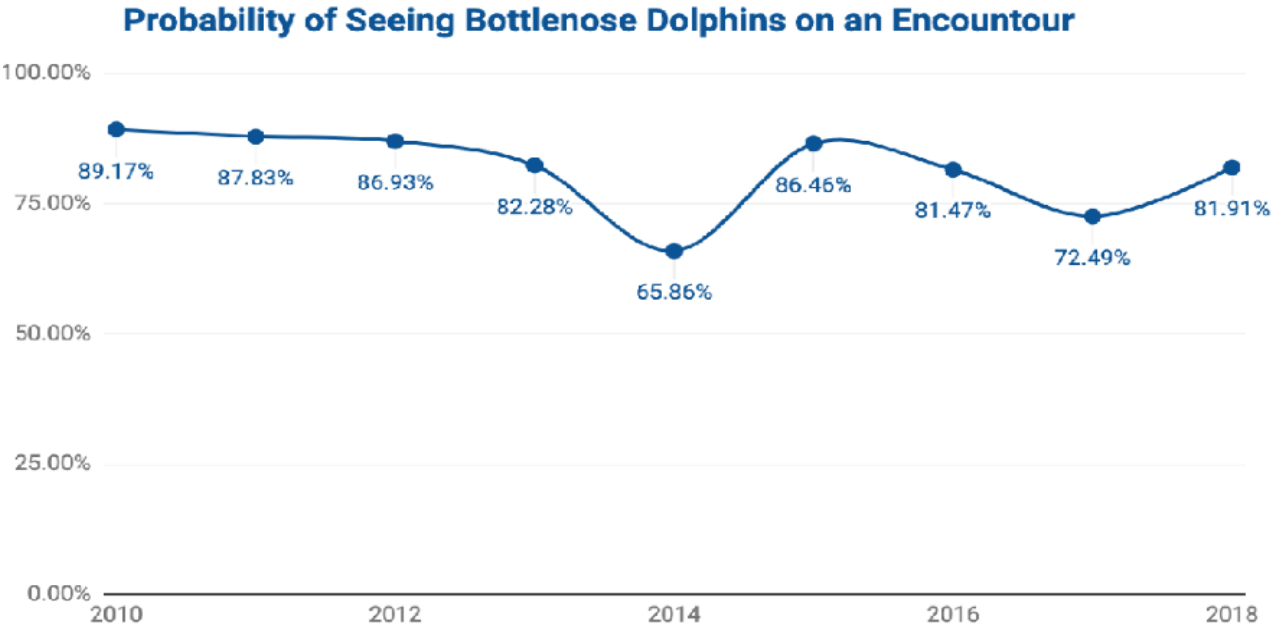


Figure 12: Probability off seeing Bottlenose dolphins 2010-2018

The overall 8-year trend shows a 7.25% decrease in the likelihood of BND sightings per excursion (Figure 12). Conversely, from 2017 to 2018 there is a 9.42% increase in the possibility of a BND sighting. There was a notable variation in the CBT operators code of conduct over the 2017 period with the implementation of a voluntary 'one drop' policy over peak seasons (see Annex 1). DERC was forefront in promoting this voluntary code implementation.

Plainly put, by signed agreement, it sees CBT operators only being permitted to one water-entry with the bottlenose dolphins per launch during peak seasons; out of season authorised operators are allowed up to two water-entry attempts depending on the dolphins' behaviour. It is still too early to make any concrete correlations in relation to the BND sighting likelihood increase between 2017 and 2018. Only time will be able to confirm if this voluntary code has been enough to enhance BND sightings per launch; especially during peak seasons. However, we are positive in the outlook that our current code of conduct minimises the negative impacts of CBT and provides an environment where CBT can be both ethical and sustainable (Diana, 2018).

Bottlenose dolphins are the most commonly sighted species by DERC and can be seen throughout the year, making them a resident population. Figure 13 below shows a per month distribution breakdown for our most commonly sighted species during the 2018 period. Followed by the migratory Humpback Whales that are seen in our waters from June to November.

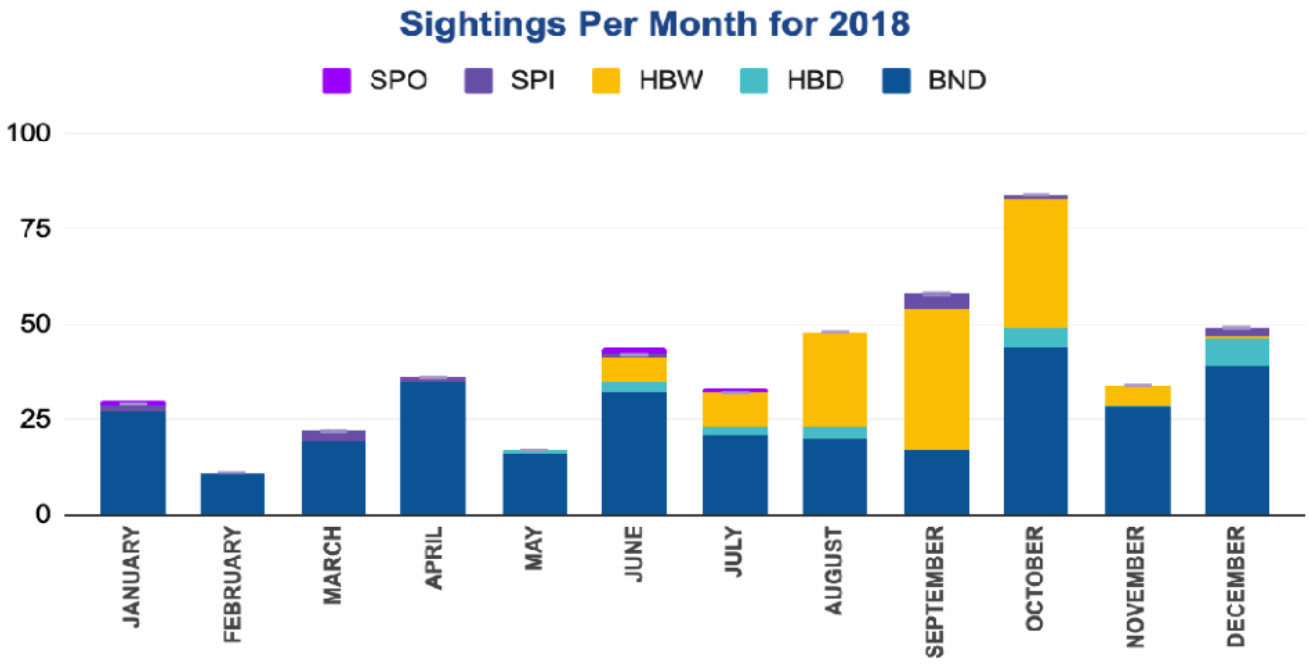


Figure 13: Per month distribution of commonly sighted species 2010-2018

2: Area of observations

Area and GPS-coordinates of each observation was recorded. For the purpose of this report, areas were grouped into Bays. Peak seasons were recorded as all major South African school holidays and *all* public holidays and included blocked dates of 13 December to 14 January; 18 March to 7 April, 25 to 02 May; 16 June to 26 July, 25 September to 8 October.

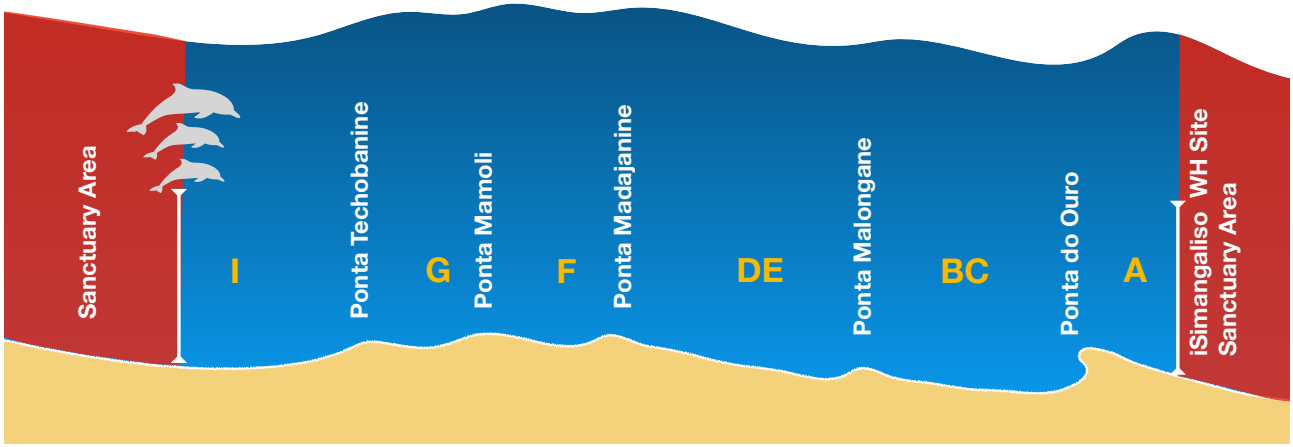


Figure 14: The lower bays of the Ponta do Ouro Partial Marine Reserve with area codes as reference.

The bay of Ponta do Ouro (Area BC) found the most recorded sightings 58% overall and continued to be the area where local resident dolphins were encountered the most both during peak and non-peaks season. Malongane Bay (Area DE) found 22% of sightings and was followed by the Kosi Bay Side (Area A) with 14%. Area F - the maximum turnaround limit on 2 hr commercial marine mammal tours recorded 4% of sightings only.

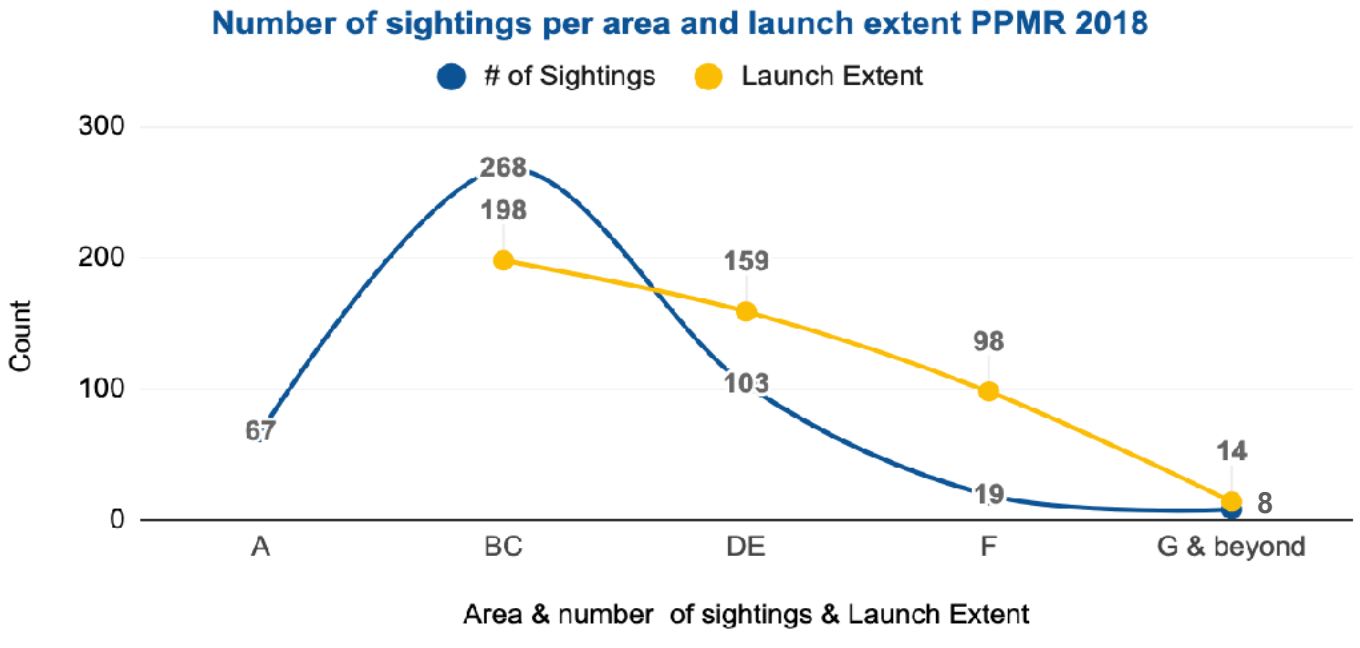


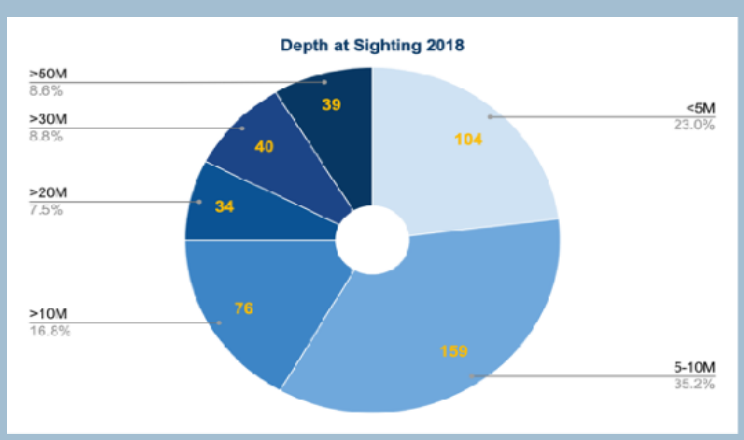
Figure 15: Area breakdown of sightings and launch extent.

Ponta do Ouro bay records the highest sightings of coastal dolphins (268) due to once a successful encounter is had the boat does not continue to travel north into adjacent bays, however opts to offer snorkelling over shallow reef in summer and in good visibility conditions or goes offshore in winter to record humpback whale activity.

Tours cover the overall distance of 30km roundtrip, if maximum launch extent - Area F is only driven in the event no marine mammals are seen sooner. Prior to 2010 the maximum launch extent was standard operating procedure for every launch, however, with the increase in marine-based tourism activities (dolphin swimming, ocean safari's, scuba diving and recreational boating) DERC has now adapted their code of conduct accordingly - in that if a successful encounter is had, the vessel turns back towards Ponta Bay and moves offshore out of the dolphins preferred range. This results in one less boat operating within the full home-range of the coastal dolphins, however, this does reduce the amount of distance covered and observational data collected.

The direction the boat was traveling when the sighting occurred was also recorded for 2018. 75% of the time the sightings occurred when the vessel was traveling north, 25% found the observations occurring on the southern trip heading home. Launch extent was recorded with Area F being the turnaround for 2hr commercial cetacean-based tourism tours. We found that 22% of the time DERC traveled to the launch extent. Depth and bottom topography indicates that; 58% of observations occurred in shallow waters extending from the shoreline to 10 meters in depth highlighting that the local dolphins use this area frequently for resting, socialising, foraging and traveling.

Bottom topography during encounters were mostly over sand 58%, followed by mixed bottom of sand and reef 11% and then reef only 3%.



Pygmy Killer Whale

Figure 16: Chart showing depth of sightings

3: Meteorological data

Sea state was recorded and measured by means of the Beaufort wind force scale. Tours were mostly undertaken in calm seas, 70% when winds were blowing between 1-3knots followed by 23% for Beaufort scale 2 and 4% wind force 3. Beaufort scale 0 - no wind and glassy seas was recorded on 3% of launches.

Dolphin Encountours generally do not take place in sea state greater than 3 although sea state maximum 2 is preferred in order to create a safe, calm space for humans and dolphins to engage. We found that 52% of launches were done in partly cloudy conditions followed by clear, overcast and rain on 4%. Predominant wind direction during launches was S, SE, SW winds 59% and onshore N, NE and NW wind direction 40%.

We found current direction to be mostly shared with south north running at 45% of the time while a north south 44%. No current was recorded on 10% of tours. Water temperature was noted and compared online to archive data. 73% of observations occurred in temperatures between 21 to 23 °C, followed by 21% in waters between 24 to 26 °C, and 6% in temperatures above 27 °C. www.seatemperature.info.

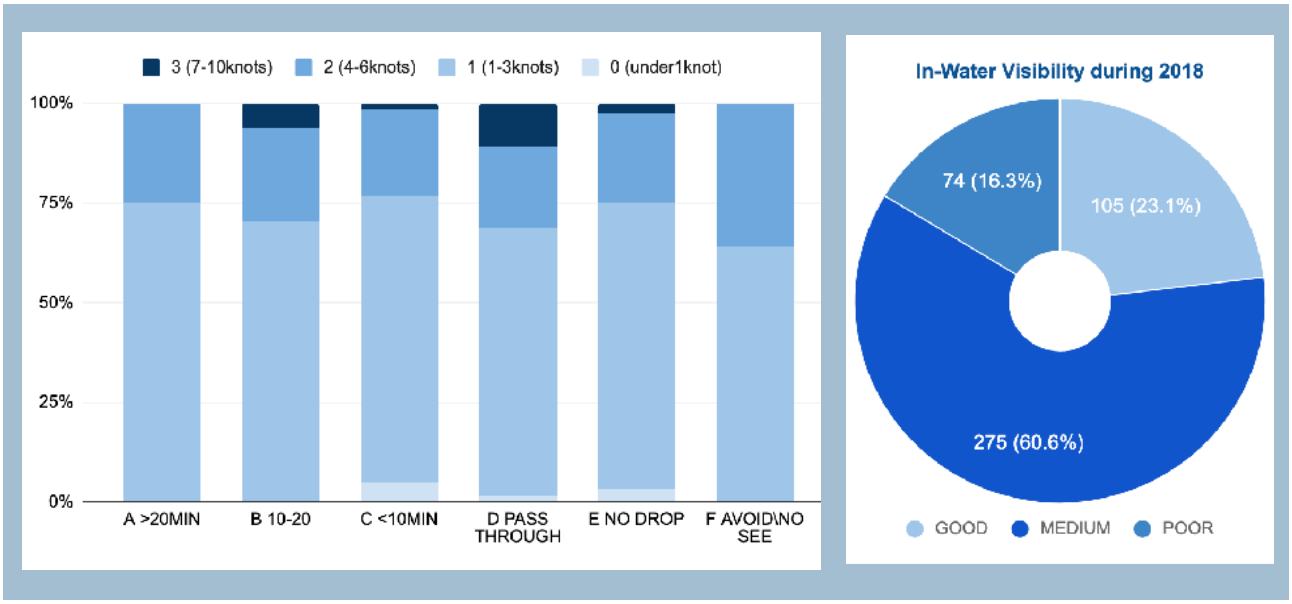


Figure 17: Chart showing Beaufort wind scale compared to encounter type.
Figure 18: Chart showing visibility during in-water encounters with dolphins in Ponta do Ouro.

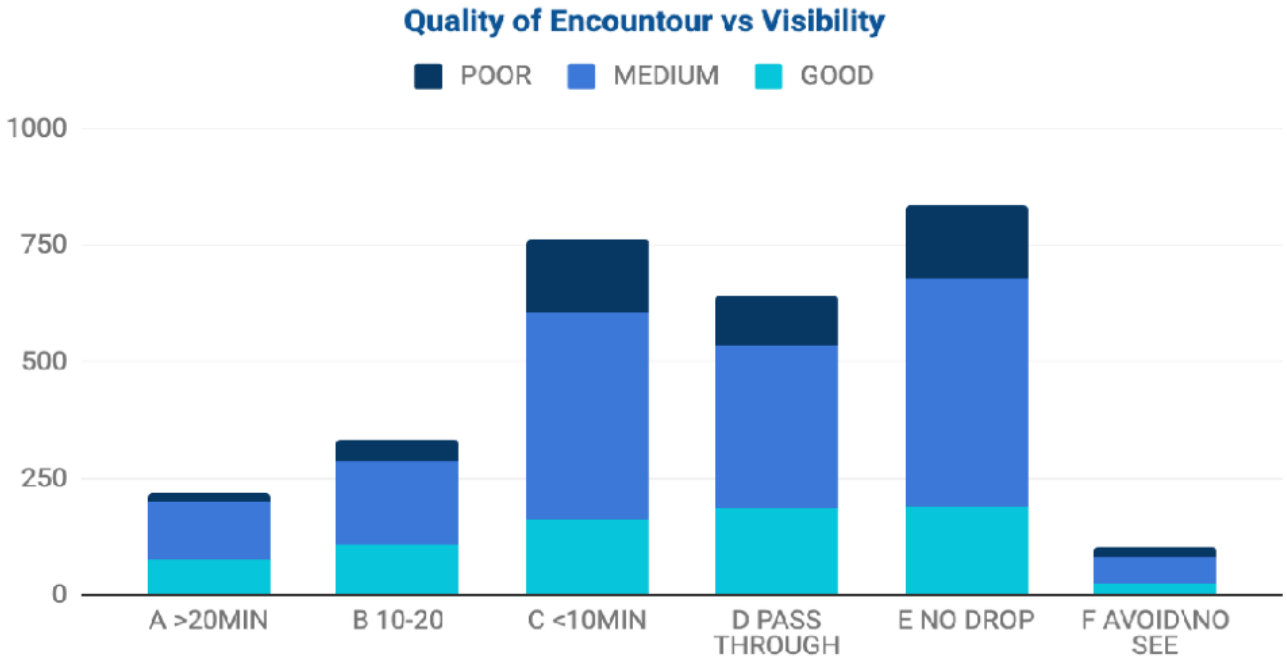


Figure 19: Chart showing quality of encounter and visibility.

Visibility was included in the data collection and was recorded as poor - less than 5 meters in-water, medium- 5 to 10 meters clarity and good- more than 10 meters clarity. Various factors influenced visibility and included sediment in the water due to surf and current as well as various organisms which were recorded.

Stinging cells (Cnidocytes)- are referred to organisms in the water that can cause pain to human swimmers if encountered; these can be in the form of slight tingles caused by hydrozoans like fire corals, blue bottles / Portuguese man of war and jellyfish encountered 34% of the time.

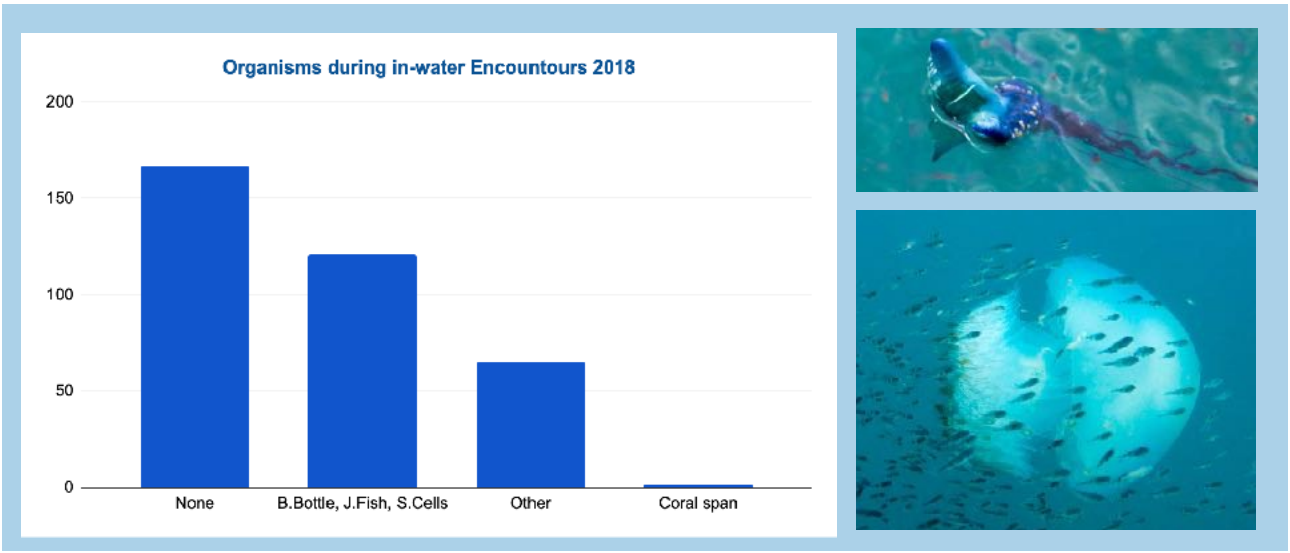


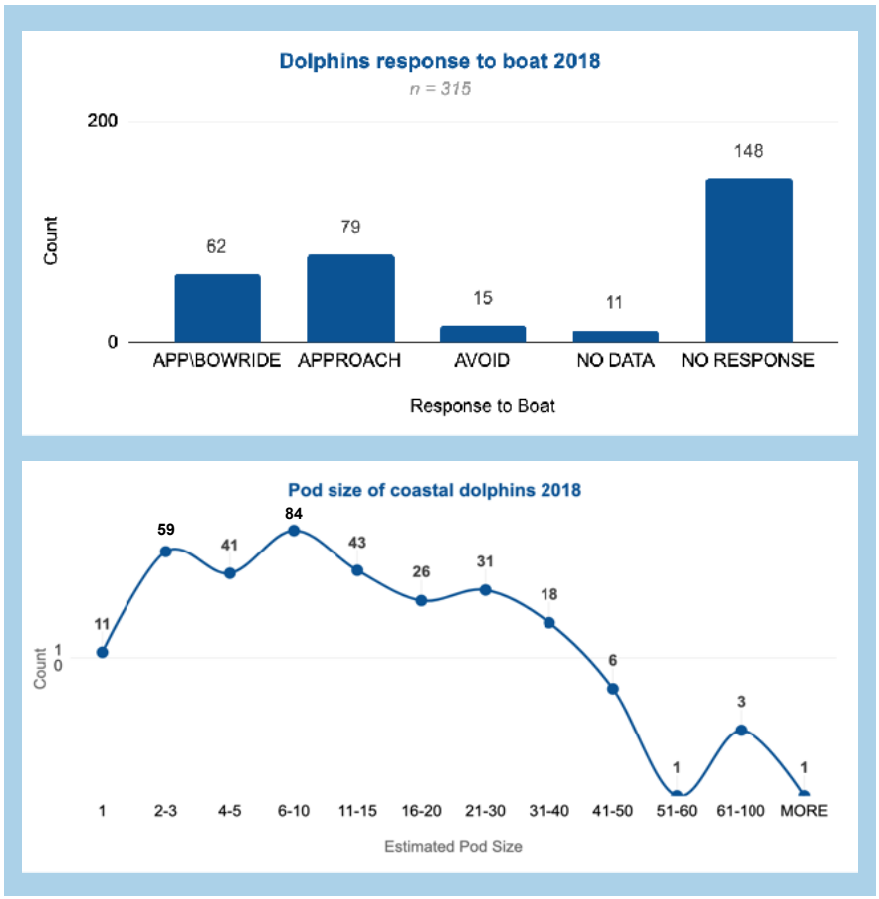
Figure 20: Chart showing organisms encountered in-water during Encountours.
Figure 21: Bluebottle / Portuguese man of war.
Figure 22: Lion Mane jelly fish.

4: Coastal dolphins overall pod size, number of pods & boat response

On approach and while undertaking the tour the number of individuals are counted and the amount of pods within the vicinity of 100m was recorded. Coastal dolphins were mostly observed, 72% of the time, in a single group comprised of 6 to 10 individuals.

Pod formation was observed and DERC found that most pods 60% were tightly grouped; dolphins swimming within 1m of each-other. Newborn dolphin's - less than 30 days old identifiable by size, foetal folds, darker colouration with white around eyes were confirmed on 23 occasions. Half the time pod composition was found to be mixed with males and females of all ages 50%, nursery only pods 20% and male only groups 7%.

Response to boat was recorded on sighting and DERC found no response 47% of the time, while dolphins approached 25% of the time and approached to bow ride 20% of the time. In other words, dolphins approached the boat almost half of the time. Avoidance to boat was observed 5% of launches. Observations remained relatively un-disturbed with only 15% of the time other small vessels approached within 100m.



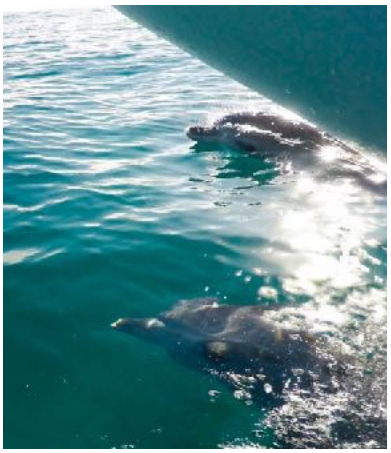


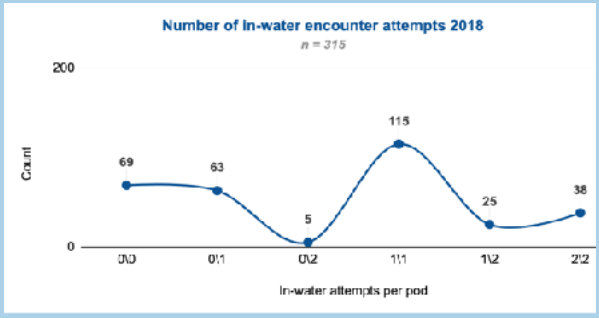
Figure 23: Chart indicating the dolphins response to boat.
Figure 24: Chart and breakdown of pod size during observations.
Figure 25: Above. resident dolphin Lolly with her newborn. Image DERC.
Figure 26: Below, dolphins on the bow of Avalon - DERCs vessel. Image DERC.

5: Response to human swimmers and the amount of encounter attempts

As part of standard data capture, the 'quality' of encounters with wild dolphins is measured by grading the level of interaction between dolphin and observer. **A** being 20 minutes plus in the water with dolphins who spend time going about their own behavior undisturbed while engaging with observers (conscious interaction) eg, social sexual behavior on the seabed and when returning to surface for breath - engage. **B** is between 10 to 20 minutes as above and **C** is less than 10 minutes based on the above. **D** is less than 5 minutes in the water where dolphins pass through observer's with no interaction at all. **E** is no water entry while **F** (new category) is avoidance or no sighting in water.

Class C was the most frequent encounter type 40%. Comparing data to 2011 there has been a further decline in Encounter type A, however, an increase in types B and C. The amount of in-water attempts was recorded as 0/0 being no drops, 0/1 no interaction on one drop. 0/2 no interaction on two drops; 1/1 interaction on one drop; 1 / 2 one interaction on two drops; 2/2 two interactions on two drops. On most occasions DERC did one drop per pod.

Over the past number of years DERC has noticed an increase in aggressive behavior from mature male dolphins. This behavior includes mock charging, open jaws and jaw clapping and was observed in 15% of in-water encounters for 2018.



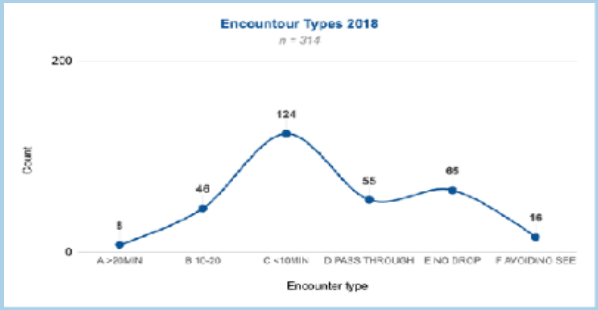


Figure 27: Chart indicating the number of in-water swim attempts wi9th dolphins.
Figure 28: Image Bottlenose Dolphins direct approach and slow to engage with observers. Image DERC

Figure 29: Chart indicating encounter type in 2018
Figure 30: Image Bottlenose Dolphins direct approach with open jaws; observers should NOT follow & exit the water. Image DERC

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6: Overall behavior of pods encountered

Behavior was recorded on approach of the pod, while in the water and on departure. For the purpose of this report we look at four basic behaviors; travel - the pod is moving in the same direction at the same speed; rest - pod is tightly grouped together spending more time underwater than on the surface either moving in one direction or milling in one area. Hunt - dolphins are seen chasing fish, fish in mouth or bottom grubbing for prey under the surface of the sand. Social - dolphins observed socialising amongst themselves, including social sexual behavior and play. During encountours DERC found that dolphins were found to be traveling on 235 occasions, followed by 102 social observations, 99 resting bouts and 41 hunting sessions.

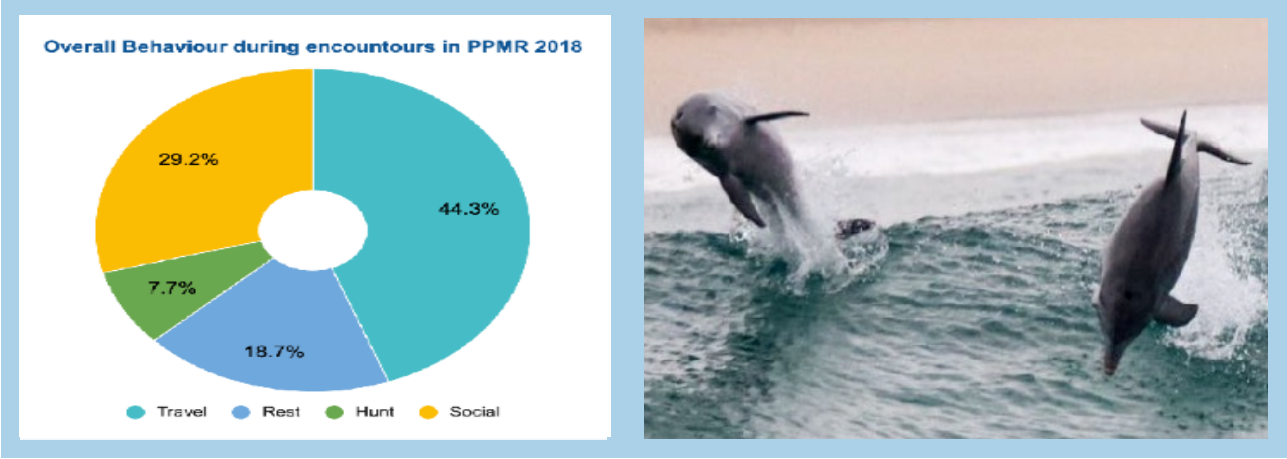

Figure 31: Chart indicating basic behaviour during observation.

Figure 32: Image above dolphins surfing inshore - travel

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Figure 33: Image above dolphins in tight formation - rest
Figure 34: Image below surface activity - social
Figure 35: Image below adult female with a cuttlefish - hunt

Over the past number of years DERC has noticed an increase in aggressive behavior from mature male dolphins. This behavior includes mock charging, open jaws and jaw clapping and was observed in 15% of in-water encounters for 2018.

7: Re-Sightings of catalogued individuals in the PPMR

Individuals knows to DERC were recorded on the data sheet while at sea and then entered onto the google sheet. From this data we could extract the amount of times catalogued individuals were sighted during 2018. This is a portion of the population known to researchers, this is not the entire population. 33 known females were recorded throughout the year. Rocha and Ripple were the most recorded mother and calf pair during encounters, followed by Rocha's mom Bo and her female offspring Bojangles. Gilly, Gambit and Gulliver were also frequent visitors as was Silva. 46 known male dolphins were seen, mature males Skellitor, Elvis, Feather and Avalon have been frequent visitors.

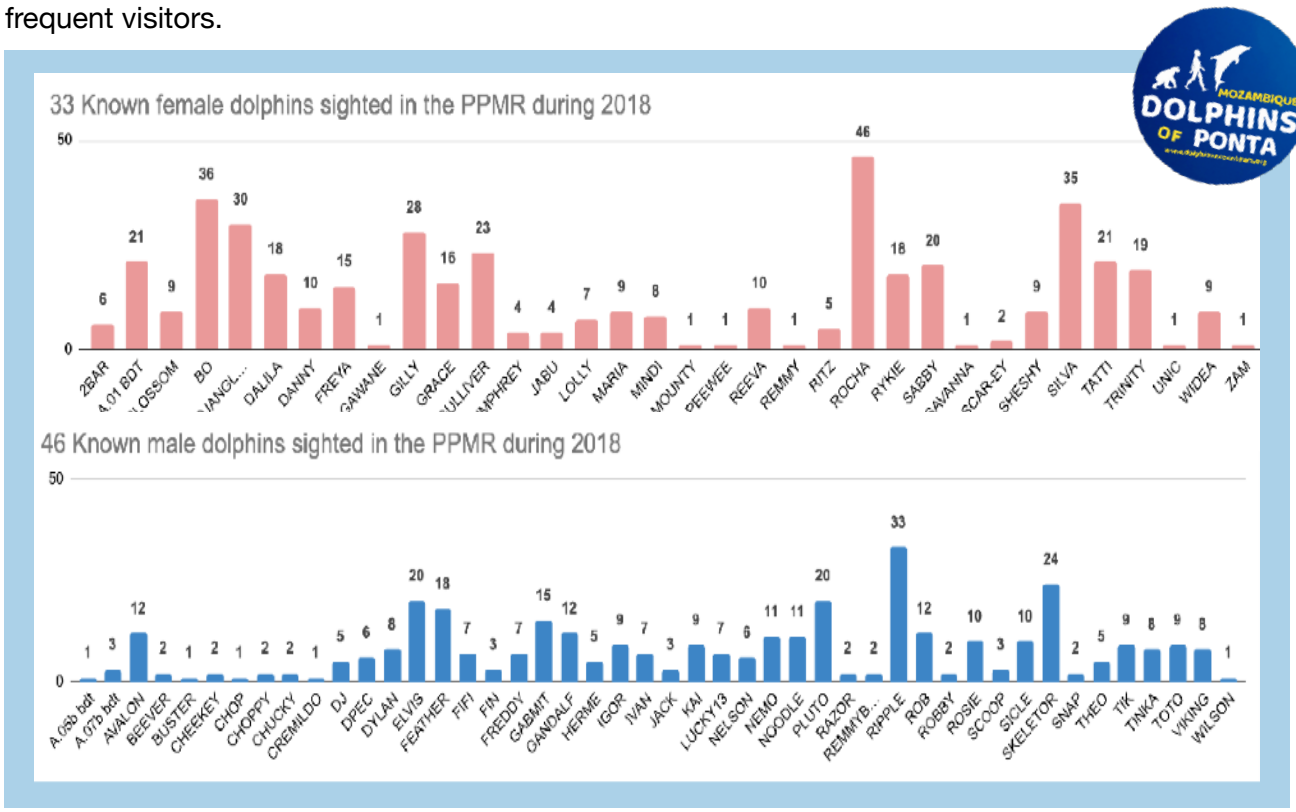

Figure 36: Chart showing frequently sighted female bottlenose dolphins during 2018
Figure 37: Chart showing frequently sighted male bottlenose dolphins during 2018

Figure 38: Examples of dorsal fin identification in the PPMR by DERC

8: Stranding's and specimen collection

DERC and the Ponta do Ouro Partial Marine Reserve attended a live stranded humpback whale on the beach in Ponta do Ouro on the 11 September 2018. An assessment was undertaken together telephonically with Dr Jennifer Olbers from the KZN Marine Stranding Network and it was concluded that the whale was in poor health, given its body condition, the large presence of whale lice, shallow, irregular breathing and unresponsiveness. With this in mind, the decision was made not to attempt a re-float, as this would cause added stress, most likely be unsuccessful and cause the whale to drown. Thus the decision remained to rather let the whale pass on in peace on the beach. A difficult and painful call to make, for all involved. Fillimone Javane, a PPMR Reserve Guard together with his team assisted in translating the situation to the growing crowds, while volunteers lead by citizen scientist Angie Gullan went about collecting measurements and taking blubber and skin samples for analysis. Part of the skull and ribs were collected as well as a complete pectoral fin for later museum display by DERC; which is permitted by the PPMR and The Natural History Museum of Maputo to collect bones from skeletal re-articulation. Unfortunately, other parts of the skeleton were illegally removed by the public. The Skeleton Project completed two skeletons in 2018, one being a Sub-Antarctic fur sea and the second a Green turtle. This is a growing collection that will be used for public display in Ponta do Ouro.

Figure 38: Image top, live stranding of a humpback whale. Image DERC
Figure 40: Image above: Carcass the day after the stranding. Image DERC
Figure 41: Image right retrieval of skull by M. Niemeyer DERC and F. Javane PPMR. Image DERC.

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9: Clean-ups & surveys

A total of four arranged beach clean-ups were undertaken during 2018 totalling 43 since the proclamation of the reserve in 2009. This included beach drives to neighbouring bays including Ponta Dobela, Millibangalala and south of Malongane bay. Prior to clean-ups a briefing / presentation is given highlighting the pollution problems in the marine environment and how one can go about reducing ones impact.

Overall 450 people participated, including school children, operators, visitors and homeowners. Over 30 000 items of man made debris was collected with plastic bottle tops and pieces being the most found ±16 000 collectively. The total weigh-in for the year was 3400kg filling some 350 bags. The project was kindly supported by Ocean Conservancy, PlasticsSA, Florestina, Ponta Kukula and Ponta Beach House who assisted in donations of plastic bags, light meals, rubbish removal and tee-shirts.

During 2018, DERC partnered with the The Big Microplastic Survey to collect data on microplastic in southern Mozambique. The project was developed as a collaboration between Just One Ocean and the University of Portsmouth. Data enables the researchers to evaluate the distribution and composition of microplastics around the globe. Between August and December, 15 microplastic surveys were undertaken in the PPMR.

Figure 39: Chart showing frequently sighted male bottlenose dolphins during 2018

Figure 42: participants from the American International School in Maputo Mozambique with their collection of rubbish from an arranged beach clean-up. Image Cassie Anderson for DERC

10: Presentations, Conferences, Media and Events

Over the year ±250 presentations were given by DERC to guests and volunteers participating in cetacean-based tourism activities during which an introduction was given on the species occurring in the Reserve, research projects, partners, behavior, problems facing marine mammals and how to behave when encountering them in the wild.

DERC was represented at two conferences and worked and assisted on a number or reports, scientific and media publications as listed below.

Figure 45: Table of publications, presentations, conferences, media and events during 2018

January 2018	The Incidence of bent dorsal fins in free-ranging cetaceans Alves et al https://onlinelibrary.wiley.com/doi/epdf/10.1111/joa.12729	Publication
March 2018	DERC team completed a course in Ocean Literacy and Marine Science for Local Schools in collaboration with Green Bubbles NGO.	Attendance
June 2018	Mozambique Beyond the beaches -- Emma Gregg http://www.natgeotraveller.co.uk/destinations/africa/mozambique/mozambique-beyond-beaches	Publication NatGeo Traveller
April 2018	WCA - Global Best practice guidance for responsible whale and dolphin watching. Assisted with developing guidelines.	Publication
July 2018	Angie Gullan - For the Love of Dolphins in Mozambique. Lyall & Joy Sustainable Jungle https://www.sustainablejungle.com/podcast/episode-33-dolphins-mozambique/	Podcast interview
August 2018	African Marine mammal Colloquium - A critical evaluation of the cetacean-based tourism impacts to a resident population of Indo-Pacific bottlenose dolphins *(Tursiops aduncus*), on the Ponta do Ouro Partial Marine Reserve (PPMR) - Diana Rocha1 with Angie Gullan2 https://www.academia.edu/40279969/A_Critical_Evaluation_of_Cetacean-Based_Tourism_impacts_to_a_Resident_Population_of_Bottlenose_dolphins_in_the_Ponta_do_Ouro_Partial_Marine_Reserve_-_Mozambique	Poster Presentation
September 2018	Synchronized Whale Watching Day was hosted for the 10th year. On this day whale watches along the East African coastline between Mozambique and Kenya count whales on a given day. In Ponta do Ouro 73 humpback whales were observed.	Attendance
October 2018	A critical evaluation of the cetacean-based tourism impacts to a resident population of Indo-Pacific bottlenose dolphins *(Tursiops aduncus*), on the Ponta do Ouro Partial Marine Reserve (PPMR) - Diana Rocha https://docs.wixstatic.com/ugd/f664c9_a4eb5ed8f6194800a8e9a35f2d70649a.pdf	Dissertation Rocha
December 2018	African Bio Acoustic Conference. Global Best Practice Guidance for Responsible Whale and Dolphin Watching: Tourism activities involving wild cetaceans. A guide by the World Cetacean Alliance with support from ClubMed. Brighton, UK.: Lewis, S. & Walker, D. (2018).	Attendance Assisted

11. Concerns and Recommendations

Figure 43:Image, sub adult males showing open jaw behaviour, image DERC

1. The PPMR has limited permits for marine mammal tourism activities; 5 pending 6 operators within ±100km. However, our concern is that 4 of these are clustered in 16km. During the busy season, when all four operators are launching daily, we have noted a **decrease in marine mammal sightings and encountour quality.** Thankfully with the support of the PPMR and the other CBT operators in the area, we have implemented a voluntary code of conduct (Annex 1) to **reduce in-water drops to one per launch and one dolphin pod per launch** during busy seasons; and a no-queueing rule throughout the year. Further research is needed to assess if this voluntary code of conduct is enough to promote sustainable CBT during our peak holiday seasons.
2. In a study by Bejder et al (2006) a resident population of bottlenose dolphins in Western Australia suffered a substantial population decline caused by dolphin tourism. And the point is reiterated, that in order to lessen the negative impact on the local dolphin population CBT needs to be done in a sustainable manner; where the operators are committed to a monitoring plan that promotes the well-being of the target cetaceans (Bejder et al., 2006). In 2009, recommendations were made to the National Director of Environmental Management by Dr Almeida Guissamulo to limit the amount of operators to 1 per 20km. There was a follow through on this in the first draft of the Management Plan for the Reserve which was proclaimed in the same year.
3. A shortfall however, exists in the management plan that finds a loophole were a **further 5 scuba diving operators take tourists on ocean safari's**, many of whom travel the shoreline looking for dolphins or head offshore looking for whales. The use of the same route as marine mammal operators finds a large number of boats traveling the same area increasing the noise and traffic pollution in the home range of local dolphins. Recommendations include making a **sanctuary zone along the shoreline and having a closed off time so dolphins can rest/ socialise in peace**. We hope that the new Management Plan currently under review, will consider the oversight in allowing Ocean Safari's and limit these activities in the PPMR.

4. With the addition of the tarred road in November 2018, we have seen a substantial influx of visitors which means a **large increase in pollution**. Over the peak periods the beach is amassed with humans and their rubbish which is often left on the beach for the cleaners. Recommendations include **reducing the use of single use water bottles - this can be achieved by having fountains for tourists** to fill water bottles and reducing the amount of take-way containers. Call for sponsorship to assist in regular, educational beach clean-ups with the local schools; we require funding in the form of refreshments, rubbish bags, t-shirts, pens, clipboards, projector, educational posters, materials and sustainable alternatives to plastic as a take-home message for the local school children.
5. Both **recreational fishing and off-shore illegal commercial fishing** occurs within the PPMR. Resident dolphins have been observed entangled in fishing line. Recommendations include **no trawling fishing line with lures and hooks in the coastal shallows** and if offshore and dolphins/whales are seen, lines should be immediately pulled in. No fishing should be permitted when dolphins are present
6. The **proposed development of the Techobanine Port structure** at a large scale industrial complex within a protected area is very concerning as it will have a very negative impact on both our resident and transient dolphins and will affect the humpback whale migration route. Over and above the area is nesting ground to both the leatherback and loggerhead turtle. It is anticipated in the **coming years, the area will be declared a national park** - offering more protection against such developments.

Figure 44: Image above Humpback whale fluke with Orca rake marks, image DERC
Figure 45: Image belowDolphin with fishing line in mouth, image DERC

12. Conclusion

Dolphin Encountours Research Center has continued to monitor and promote the interests of the local population of resident dolphins who are now an important tourism component in the area. Today DERC - like all organisations working with wild animals faces the major challenge of trying to protect a species in an area that is booming in tourism. As more and more people swap out captivity for wild encounters DERC leads the way in responsible and ethical practice when working with dolphins and whales. We sincerely hope our efforts & work proves of value and trust that the data and information herein can be better used for the management of marine mammal tourism in Mozambique.

13. Acknowledgement

We would like to take the opportunity to acknowledge the many people who have worked with DERC over the past year. Special mention goes to our captain Mitchel Niemeyer and deckhand Dallas Cremido whom without which safe sea travel and identification images would not be possible. The many volunteers who assisted in beach clean-ups, surveys, data cleaning, capturing and sorting. Laure Martin and Wichard Sullwald for assisting DERC with the many formulas needed to make the data sheet operate smoothly. DolphinCare Volunteers: Lukas Seland, Reeva Taback, Dagmar Steffens, Hartmut Kann, Nynke van der Helm, Cassie Anderson, Sophie Vadnais, Laure Martin, Sabina Eisermann, Phoebe Baker, Florence Granito, Marijke Algra, Amelia Martin, Inga Floer, Aitana Galbeño, Jared da Cruz Griffin. This project is funded primarily by participants on commercial Dolphin Encountours and DolphinCare Volunteer Programs in Ponta do Ouro. Special thanks to the German Dolphin Conservation Society who's funding assists in camera equipment for the Dolphins of Ponta ID Project. The project would not be possible without the support and authorisation of the Ponta do Ouro Partial Marine Reserve, the Department of Conservation Area's and the Natural History Museum Maputo. **Partners**: Ponta do Ouro Partial Marine Reserve, World Cetacean Alliance; German Dolphin Conservation Society, Sousa Consortium, Natural History Museum Maputo, Ocean Conservancy, The Big MicroPlastic Survey, IndoCet, HappyWhale, Plastics SA, Keep Ponta Clean, Ponta Kukula.

The Dolphins of Ponta, thank you for letting us share your world with you and for allowing us to learn a bit more everyday what it means to be a wild dolphin.

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https://www.wiomsa.org/wp-content/uploads/filebase/book_series/sustainable_dolphin_tourism.pdf

LIST OF ANNEXES

Annex 1: Code of conduct from PPMR Management Plan *Rocha, 2018; DNAC 2009)

PONTA DO OURO PARTIAL MARINE RESERVE (PPMR) CODE OF CONDUCT FOR DOLPHINS, WHALES AND WHALE SHARKS	
MANDATORY APPLIES TO ALL VESSELS, SURFERS AND BEACH GOERS **IMPLEMENTED INTO PPMR MANAGEMENT PLAN 2009**	Unless authorized, vessels are not to approach marine mammals within 300 meters.
	No person will chase, herd, catch, kill, harass, feed or disturb marine mammals at any time.
	Keep a slow, steady speed without changing course if your vessel is approached by marine mammals to bow ride and refrain from altering course to approach them.
	Authorized operators always approach from the side, never from directly behind or in front.
	Minimize noise disturbance by maintaining a slow steady speed.
	Do not approach dolphins/whales with a small power craft i.e. jet skis.
	Marine mammals have right of way.
	Do not enter into the water with newborns.
	Only enter into the water with qualified and authorized personnel i.e. an authorized cetacean-based tourism operator.
	Keep noise levels to a minimum, no shouting or loud whistling.
	A 20 minute viewing time is to be followed, if marine mammals move off within this time they must be left alone.
	Refrain from interference if signs of disturbance are apparent i.e. change of directional swimming, fast “escape” swimming, extended dive times or erratic directional surfacing.
	No fishing; dolphins may not be pursued for capture or attempt to be caught.
VOLUNTARY APPLIES TO AUTHORISED CETACEAN-BASED OPERATORS **IMPLEMENTED UNDER GENERAL CONSENSUS 2017**	In peak seasons reduce the number of swim attempts per dolphin group to one.
	In peak seasons reduce the number of groups approached per tour to one.
	No-queue policy, if one boat is engaged with a dolphin group no other boats are to wait, instead boats must move on seeking other dolphin groups.

Annex 2: DCA t/a DERC Code of conduct and operating procedure.

DOLPHINCAREAFRICA CODE OF CONDUCT

OPERATING PROCEDURES

Dolphin Encountours Research Center

DolphinCare Code of Conduct developed for commercial Dolphin Encountours in Moçambique with the support of Museu de Historia Natural, Universidade Eduardo Mondlane. The code is a standard operating procedure that offers participants in commercial dolphin swims knowledge and skills that can empower best practice for in-water observations of wild dolphins. We refer to this code in preparation for, during and after in-water observations of wild dolphins. The code is based on research findings obtained from longterm fieldwork that has a reliable, repeatable and recordable methodology for observing dolphins in the wild.

A. Gullan, A Guissamulo, S. West, D. Rocha. 2013 version updated from original that was created in 1996 under the guidance of the Centre of Dolphin Studies in South Africa & International Dolphin Watch Uk.

CREATED IN 1996
REVISED REGULARY

Welcome and introduction to the species found locally Covering different species including the bottlenose, humpback & spinner dolphins – explain various characteristics and abundance.

Boat briefing & safety instructions Participants are instructed on boating safety and regulations. Participants are to be calm and quiet at all times. Under no circumstances swim under the boat or in front of it. Move around the back staying clear of the motors. Do not stray too far from the boat. Do not swim inshore into the waves, swim parallel to the shore line.

Water entry and swim postures Wait for the skippers instruction before getting off the boat. Once off the boat immediately move away and stay clear of the motors. Participants enter into the water in limited numbers (dependent on pod size and behaviour), in a slow gentle motion. No backward rolls or diving off the boat. Participants float with their hands behind their back and wait for the dolphins to approach them. Participants are not permitted to swim after, dive down or chase the dolphins.

In-water conduct Once in the water stay in a group with your swim guide/ facilitator. Wait quietly for the dolphins to approach. Follow the dolphin swim guide/facilitator who has been trained on how to interact with the wild dolphins and monitor their behaviour. Do not swim directly at the dolphins or on top of them. Do not swim frantically towards the dolphins or after them.
Swim slowly and calmly causing as little turbulence as possible. Refrain from diving down. Under no circumstances touch dolphins.
Not permitted: long selfie sticks, camera flash, underwater scooter.

What to expect when cetaceans are encountered The pod is approached slowly and data is collected. Boat crew to asses behavior and likelihood of interaction. Participants are requested to prepare themselves for water entry. Photo identification to be undertaken prior, during or after in-water observations.
Skippers are only permitted to drop twice on the same pod*.
A one boat per pod policy is to be followed (in a single sighting, one boat may interact with dolphins at a time).

Explain different dolphin behavior and view/swim conduct thereof The encounter is solely based on the dolphins behavior and certain individuals within the pod. The different wild dolphin behaviors are addressed and include avoidance; resting; socialising and play (amongst themselves); interactive (circle swim + play with humans); hunting; herding and mating; bow riding; fighting, traveling and surfing.

Other Tail slapping, fighting and erratic herding behaviors will result in no water entry by participants. Newborns (foetal folds visible <3 weeks) results in no water entry by participants. No water entry with deep resting dolphins or dolphins that show avoidance. Swimming with whales is not encouraged*. Every attempt should be made by crew NOT to interfere with marine mammals natural behavior. Feeding and coaxing dolphins is not permitted.

Area intended to monitor. Explain the coastal zone and monitoring area.

The launch. A further safety briefing is done at the boat; clients issued lifejackets; radios / cell phones on board. Whilst at sea, behaviors are explained to participants by crew.

Dolphin enviro-safe briefing "be aware + take care. Short intro into shallow reef snorkelling, what can be encountered, likelihood of sharks, pollution and fisheries update. Encountering sharks and migrating whales (whale season)

Annex 3: DCA t/a DERC IN-WATER Code of conduct presentation slide