EXPEDITION REPORT

Expedition dates: 3 April - 10 May 2010
Report published: November 2010

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Whale Watch Azores

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Matthias Hammer (editor)
Biosphere Expeditions

Abstract

In 2010 Biosphere Expeditions concluded its seventh successful year of cetacean photo-identification and distribution studies in the Azores. The expedition was based in Horta on the island of Faial and work was conducted around the three islands of Faial, Pico and São Jorge. The expedition ran from 3 April until 10 May 2010 and concentrated on six main projects.

Sightings of all cetacean species were recorded. 144 sightings of 9 different species of cetacean and 2 species of turtle were recorded during the expedition period. Photo-identification of sperm whales, baleen whales and bottlenose and Risso's dolphin continued.

Sperm whale photo-ID

Sperm whale photo-identification, which has been ongoing since 1987 in the Azores, continued with 47 identifiable individuals photographed from 92 encounters, including 13 animals seen in previous years.

Baleen whale photo-ID

Baleen whales, including blue, fin, sei and humpback, have been seen with increased frequency over the last few years. This year was an improvement over the single sighting of sei whales last year, with 17 groups of baleen whales encountered. 4 groups of sei, 9 fin, 1 humpback and 3 blue whales were sighted during the expedition. ID photos were taken during all encounters and some of these will be analysed at a later date.

Dolphin photo-ID

Dolphin photo-identification, which began in 1987, continued. 4 groups of bottlenose dolphin and 3 groups of Risso's dolphin were photographed. Most of these photographs will be analysed at a later date.

Europhlukes

Europhlukes is a European-wide project that brought together different researchers from several countries to share data and photo-identification pictures of various species. All photo identification photographs will be forwarded to the database. Sperm whale fluke extractions were made from the photos taken during the expedition and compared with sperm whales sighted in previous years and in other areas of the Atlantic. No matches were found to any other regions.

POPA

Data collection for the Department of Oceanography and Fisheries (DOP) of the University of the Azores, for the Tuna Boat Observer program, POPA, was successfully collected for a seventh year. The expedition vessel "Physeter" is the only non-fishing vessel in the programme. Information was collected for random cetacean sightings along transects, as well as designated turtle and bird counts and environmental parameters.

Turtles

Loggerhead turtles have been collected and tagged in the Azores since 1988 for a joint venture between the University of Florida and the University of the Azores. During this expedition 1 loggerhead turtle was caught, and 8 others were sighted. A leatherback turtle was also observed.

Sumário

A Biosphere Expeditions 2010 concluiu o seu setimo ano, bem sucedido, de estudos em cetáceos, em foto-identificação e sua distribuição nos Açores. A expedição foi baseada na Horta, ilha do Faial e o trabalho foi conduzido em torno das três ilhas Faial, Pico e São Jorge. Esta expedição ocorreu entre 3 Abril e 10 Maio e concentrou-se em seis projectos principais.

Foram registadas todas as observações de cetáceos, no total 144 observações de 9 espécies diferentes de cetáceos e de 2 espécie de tartaruga. A foto-identificação dos cachalotes, das baleias de barba, golfinhos roazes e dos golfinhos de Risso continuou.

Foto-identificação do Cachalote

Desde 1987 que está em curso nos Açores um programa de foto-identificação de cachalotes, com os 47 indivíduos identificados e fotografados em 92 encontros, incluindo 13 animais vistos nos anos anteriores.

Foto-identificação das baleias de Barba

As baleias de barba, incluindo a baleia-azul, a baleia-comum, a sardinheira e a baleia de bossas, foram vistas com frequência o que tem vindo a aumentar nos últimos anos. Este ano registou-se um aumento no número de avistamentos de baleias de barbas, com mais uma observação das Sardinheiras comparativamente ao ano passado, com 17 grupos de baleias de barbas encontradas, 4 grupos de Sardinheiras, de 9 baleias commum, de 1 baleia da bosse e de 3 baleias azuis foram avistados durante a expedição. Algumas das fotos da identificação foram capturadas durante todos os encontros e serão analisadas no futuro.

Foto-identifição dos Golfinhos Roazes e Rissos

Continuámos a foto-identificação de roazes, que começou em 1987. Conhecem-se 4 grupos de roazes e 3 grupos de Rissos que foram fotografados. Estas fotografias serão analisadas num futuro próximo.

EUROPHLUKES

Europhlukes é um projecto Europeu que reúne investigadores diferentes de diversos países para compartilhar dados e retratos da foto-identificação de várias espécies. Todas as fotografias da identificação serão enviadas à base de dados. As extracções das caudas dos cachalotes foram feitas das fotos tomadas durante a expedição e comparadas com os cachalotes avistadas nos anos anteriores e em outras áreas do Atlântico. Não foram encontradas “combinações”. Até agora nenhuma das fotografias coincide com as encontradas em outras áreas.

POPA

O levantamento de dados foi colectado com sucesso pelo setimo ano, para o Departamento da Oceanografia e Pescas (DOP) da Universidade dos Açores, para o Programa de Observação dos Pescas nos Açores, POPA. A embarcação “Physeter” é a única embarcação da “não-pesca” no programa. A informação foi colectada aleatoriamente ao longo de transectos para as observações de cetáceos, as contagens de tartarugas, de aves e dos parâmetros ambientais.

Tartarugas

As tartarugas caretta são capturadas e etiquetadas nos Açores desde 1988, para um projecto conjunto entre a Universidade de Florida e a Universidade dos Açores. Durante esta expedição, 1 tartaruga foi marcada e mais 8 foram avistadas. Uma tartaruga de couro foi observada na terça saida.

Contents

Please note: Each expedition report is written as a stand-alone document that can be read without having to refer back to previous reports. As such, much of this section, which remains valid and relevant, is a repetition from previous reports, copied here to provide the reader with an uninterrupted flow of argument and rationale.

1. Expedition Review

M. Hammer (editor)
Biosphere Expeditions

1.1. Background

Biosphere Expeditions runs wildlife conservation research expeditions to all corners of the Earth. Our projects are not tours, photographic safaris or excursions, but genuine research expeditions placing ordinary people with no research experience alongside scientists who are at the forefront of conservation work. Our expeditions are open to all and there are no special skills (biological or otherwise) required to join. Our expedition team members are people from all walks of life, of all ages, looking for an adventure with a conscience and a sense of purpose. More information about Biosphere Expeditions and its research expeditions can be found at www.biosphere-expeditions.org.

This expedition report deals with an expedition to the Azores that ran from 3 April to 27 10 May 2010. The expedition was part of a long-term research project to elucidate the life histories and migration patterns of whales, dolphins and turtles across the oceans and assist with the formulation of effective conservation strategies.

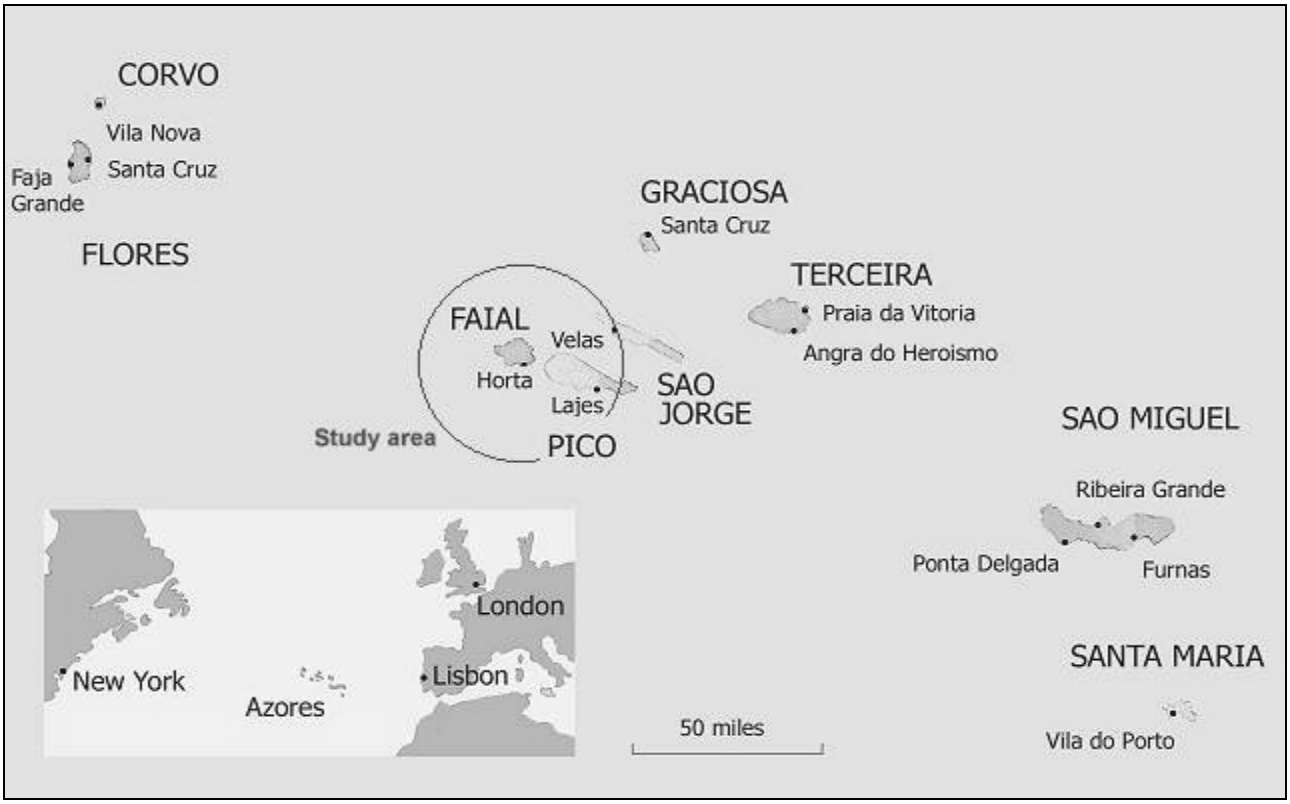
The Azores archipelago, which sits near the middle of the Atlantic Ocean, about 1400 kilometres off the coast of Portugal, is one of the prime whale and dolphin hotspots in the world and around 30% of the world's known cetacean species have been recorded there. For management purposes the International Whaling Commission (IWC) has included the Azores archipelago in the East Greenland and Iceland stocks, but there is little evidence to support this.

In 2004 the expedition initiated the first long term concerted study on baleen whales in the Azores. These animals in particular have not been studied around the Azores and accurate knowledge of the origins of the baleen whales passing the archipelago from March to May, which coincides with the migration of baleen whales past the archipelago, will help to determine which stocks they come from and assess more accurately their true numbers (which are often inflated in efforts to set hunting quotas).

The expedition also continued existing sperm whale, bottlenose and Risso's dolphin studies. The sperm whale study is part of a larger migration and social study, and the dolphin study is in the early stages of assessing animal numbers and migratory behaviour around the archipelago. Loggerhead turtles were also studied and tagged as part of an international research project studying their life history and migration around the Atlantic.

1.2. Research Area

The Azores Archipelago, Europe's westernmost point, is a group of nine distinct islands, lying on the same latitude as New York and Lisbon, around 1400 kilometres off the coast of Portugal (of which they are part). Lying on the mid-Atlantic ridge, the islands display spectacular volcanic scenery, with large blue-green crater lakes, impressive black lava sea cliffs, and, towering above them all, the highest mountain in Portugal on Pico.



Map of the Azores. An overview of Biosphere Expeditions' research sites, assembly points, base camp and office locations is at Google Maps.

The Azores were discovered in 1427 by Portuguese explorers and colonised shortly after by people of mainly Portuguese and Flemish descent. During the 20th century the islands were an important stopover point for undersea communications cables, trans-Atlantic flights and yachtsmen. Their main income is from agriculture and fishing and tourism has all but passed by the islands.

1.3. Dates

The expedition ran over a period of six weeks divided into three 10-day slots, each composed of a team of international research assistants, scientists and an expedition leader. Slot dates were:

3 - 12 April | 17 - 26 April | 1 - 10 May 2010.

Dates were chosen to coincide with the migration of baleen whales past the archipelago.

1.4. Local Conditions & Support

Expedition base

The expedition team was based on the island of Faial. Base was near the harbour in an urban ecolodge and consisted of modern en suite single and twin rooms in a guesthouse style building. Breakfast and lunch were self-catering and a local restaurant provided dinner. Vegetarians were catered for.

Field communications

The boat carried two radios for communication with other boats. There were telephones at base and there was mobile phone coverage on the island and for a few kilometres out to sea.

Transport, vehicles & research vessel

Team members made their own way to the Horta assembly point. From there onwards and back to the assembly point all transport, vehicles and boats were provided for the expedition team for expedition support and emergency evacuations.

Our research vessel, the Physeter (after the Latin name for sperm whale), was a modern offshore motor catamaran with large fore and aft decks and equipped with life raft, lifejackets, emergency beacon, two radios, radar, fish finder and other safety features.

Medical support & insurance

The expedition leader was a trained first aider, and the expedition carried a comprehensive medical kit. The standard of medical care in the Azores is high and further medical support was available at a hospital in town. All team members were required to carry adequate travel insurance covering emergency medical evacuation and repatriation. Emergency evacuation procedures were in place but did not have to be invoked. There were no serious medical incidents, just a few minor cases of seasickness and a badly sprained ankle.

1.5. Local Scientists

Biosphere Expeditions was working with Lisa Steiner and Chris Beer of Whale Watch Azores on this project.

Lisa Steiner graduated in Marine Science in 1988 at the University of Miami and joined the IFAW (International Fund for Animal Welfare) cetacean research vessel “Song of the Whale” two weeks later, which at the time was based in the Azores. Since then Lisa has spent all her summers working on cetaceans around the Azores and at other times has also studied them in Alabama, Hawaii, Cape Verdes, Bermuda, Scotland and Madeira. She has published numerous research papers on cetaceans.

Chris Beer is a marine engineer and qualified yacht master. He has worked on square rig ships with Operation Raleigh (now Raleigh International) and on the “Song of the Whale”, where he met Lisa. Chris has also worked for Encounter Overland, leading expeditions from London to Kathmandu and back as well as around India, Tibet and the Middle East. He has also published research papers together with Lisa.

1.6. Expedition Leader

Kathy Wilden joined Biosphere Expeditions in 2000. She was born and educated in England. Since gaining her BA in Business at Bristol, she has worked in sustainable development and regeneration for a variety of public sector organisations, most recently the Regional Development Agency for the East of England where she was responsible for developing and supporting partnerships working to establish sustainable development activities. At the main office Kathy is also one of Biosphere Expeditions' two Directors and is in charge of the UK organisation. She has travelled extensively, led expeditions and recceed projects all over the world. She is a qualified off-road driver, dive master, marathon runner, keen walker, sailor, diver and all round nature enthusiast.

1.7. Expedition Team

The expedition team was recruited by Biosphere Expeditions and consisted of a mixture of all ages, nationalities and backgrounds. They were (with country of residence):

3 – 12 April 2010

Anna Avery (UK), Chris Eves (UK), Katrin & Julia Gütermann (Germany), Hanne Hoeck (UK), Anja Kloth (Germany), Cara Kuipers (Belgium), Rosalyn Mayho (UK), Thomas Rothe (Germany), Anne (Margaret) Sherwen (UK).

17 – 26 April 2010

Angela Arnott (USA), Mary Flanagan (UK), Michael Hennecke (Germany), Elke Hermann (Germany), Isabel Keilig (Germany), Anne Schrödter (Germany), Randall & Bruni Slinn (USA), Cindy Stölzel (Germany), Lars Weimer (Germany).

1 – 10 May 2010

Sharareh Aref (Germany), Marcus Benner (Germany), George Benson (USA), Cornelia Brunner (Germany), Helen Davies (UK), Nathalie Dewalhens (France), Maria Rosa Almas Rodrigues (Portugal), Leslie Ruyle (USA), Lynn Stephenson (UK), Sarah Steven-Hubbard (USA).

Also: expedition leader in training John Highmore.

1.8. Partners

Our main partner on this project is Whale Watch Azores, a whale watching and research group founded by our local scientists and operating from Faial Island. Other partners include Europhlukes (a European cetacean photo-ID system and research database), the University of the Azores, POPA (the Observer Programme for the Fisheries of the Azores), the University of Florida (for research into turtles) as well as the local community of whale spotters (vigias). Corporate support comes from Land Rover & Swarovski Optik.

1.9. Expedition Budget

Each team member paid towards expedition costs with a contribution of £1090 per person per 10 day slot. The contribution covered accommodation and meals, supervision and induction, special non-personal equipment, all transport from and to the team assembly point. It did not cover excess luggage charges, travel insurance, personal expenses like telephone bills, souvenirs etc., as well as visa and other travel expenses to and from the assembly point (e.g. international flights). Details on how this contribution was spent are given below.

Income	£
Expedition contributions	33,628
Expenditure	
Base camp and food includes all board & lodging, base camp equipment	7,175
Transport Includes boat fuel & oils, taxis	4,978
Equipment and hardware includes research materials & gear etc purchased in UK & Azores	69
Biosphere Expeditions staff includes salaries, travel and expenses to Azores	4,040
Local staff includes whale lookout and other locally staffed services	783
Administration includes registration fees, sundries etc	183
Scientific services & logistics organisation Payment to Whale Watch Azores including boat wear & tear allowance	3,478
Team recruitment Azores as estimated % of PR costs for Biosphere Expeditions	4,127
Income – Expenditure	**8,795**
Total percentage spent directly on project	**73%**

1.10. Acknowledgements

This study was conducted by Biosphere Expeditions which runs wildlife conservation expeditions all over the globe. Without our expedition team members (who are listed above) who provided an expedition contribution and gave up their spare time to work as research assistants, none of this research would have been possible. The support team and staff (also mentioned above) were central to making it all work on the ground. Thank you to all of you and the ones we have not managed to mention by name (you know who you are) for making it all come true. Biosphere Expeditions would also like to thank members of the Friends of Biosphere Expeditions, as well as donors and grant-givers.

We would also like to thank our partners Europhlukes, the University of the Azores, POPA, the University of Florida, as well as the local community of whale spotters (vigias). Thank you also to Ben Rees for reviewing the draft report.

1.11. Further Information & Enquiries

More background information on Biosphere Expeditions in general and on this expedition in particular including pictures, diary excerpts and a copy of this report can be found on the Biosphere Expeditions website www.biosphere-expeditions.org.

Enquires should be addressed to Biosphere Expeditions at the address given below.

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2. Whale, dolphin & turtle study

Lisa Steiner & Chris Beer
Whale Watch Azores

2.1. Introduction

The Azores is a group of 9 islands located about 900 nm off the coast of Portugal. Twenty-eight species of cetacean have been seen around the islands over the last 20 years. Sperm whales were commercially hunted here until 1985. With the cessation of whaling, whale watching was a natural successor, but did not begin in earnest until the late 1990s. Little work has been done around the archipelago before June, which is why the expedition usually takes place in April and May.

Baleen whales have been seen fairly regularly migrating past the islands from March to June over the last several years, but it is unknown where they have come from or where they are migrating to. It is thought that they are travelling north to feed in the waters around Iceland, Greenland, Norway or even Nova Scotia for the summer. Photo-identification of the animals passing the Azores enables us to match photos with photos taken elsewhere hopefully to determine some of these migration routes. So far, there has only been one match between a blue whale photo taken off the Azores to one taken off Iceland.

Although sperm whales were caught around the Azores all year round, it has been thought that there are not many female sperm whales and calves around during the winter months. Working in April has given us the opportunity to see that females and calves are present at this time of year. In future, we would like to expand the effort to include the winter months to see if some females and calves are present in the archipelago all year round.

Photo-identification of sperm whales began in the Azores in 1987 and over 3000 individuals have been identified since then. The Europhlukes matching programme makes matching individuals much faster than it was manually.

Some bottlenose and Risso's dolphin are resident around the islands year round. By photographing individuals, we can start to see patterns of habitat use by different groups of dolphin at different times of year and compare ID photos to existing catalogues to determine what home ranges might exist for resident individuals. This requires a lot of time spent matching ID photos on the computer to identify individuals and their groups.

2.2. Methods

Physeter was used to go to sea on days when weather conditions permitted this. Vigias, local lookouts, were located on the cliffs about 150 m above sea level. They began to look for whales at around 07:30 to be able to direct the boat on departure at around 09:00. If the lookouts did not sight any whales, the boat used a towed hydrophone to locate sperm whales acoustically. The boat also had up to four additional lookouts on board, three on the bow and one in the stern searching for cetaceans. Two expedition members were usually dedicated to filling in POPA forms (transects and bird and turtle surveys). Other crew were on camera duty, data sheets, hydrophone monitoring, filling in the log or collecting water temperatures when required. On occasion crew members may have had to do more than one job.

Fig. 2.2a. Camera duty

Sperm whales were approached from behind in order to obtain fluke photographs. The baleen whales were also approached from behind, but moving further forward to obtain photographs of dorsal fins as well as chevron (fin whale) and mottling (blue whale) patterns. Bottlenose and Risso's dolphin were also paralleled in order to obtain dorsal fin photographs for identification of individuals. Two cameras were used to obtain the ID photographs: a Canon 50D with a Canon 100-400mm lens and a Nikon F70 with a 70-300mm lens (Fig. 2.2a).

Other dolphins sighted were approached for species identification and then the boat usually moved on to look for other animals if they were not one of the main target species. Data collected for non-sperm whale sightings included start and end time of the encounter, position of the sighting as well as number of animals, presence or absence of calves and general behavioural state (milling, feeding, bowriding or travelling).

Only four categories of behaviours were differentiated, because generally not enough time was spent with the animals to break behaviours down further. If the animals were travelling, a direction of travel was noted. In addition, environmental information was also recorded, including water temperature, wind speed and direction, sea state (Beaufort scale), and visibility. The number and behaviour of birds associating with the dolphins or whales was also recorded as was the presence of other whale watching vessels.

Data collected for sperm whale sightings included date, start and end time, cue (how the whale was spotted - a blow, the back, the vigia told us or a splash), number of whales, number of calves (the calves also count in the whale column), visible callous (a growth on the top of the dorsal fin which indicates the whale is female) or if the whale was male, position, fluke heading, defecation, if any skin was collected or recordings made and the presence of other whale watching boats.

When loggerhead turtles were sighted, their position was recorded on the POPA forms (Fig.2.2b). If the animal was caught, then it was measured and tagged for the University of Florida/University of the Azores turtle tagging programme. Positional data was also recorded (Fig. 2.2c).

Fig. 2.2b. POPA duty.

Fig. 2.2c. Turtle capture and tagging.

When the boat returned to port, there was a debriefing on board to show where the boat had been during the day (Fig 2.2d).

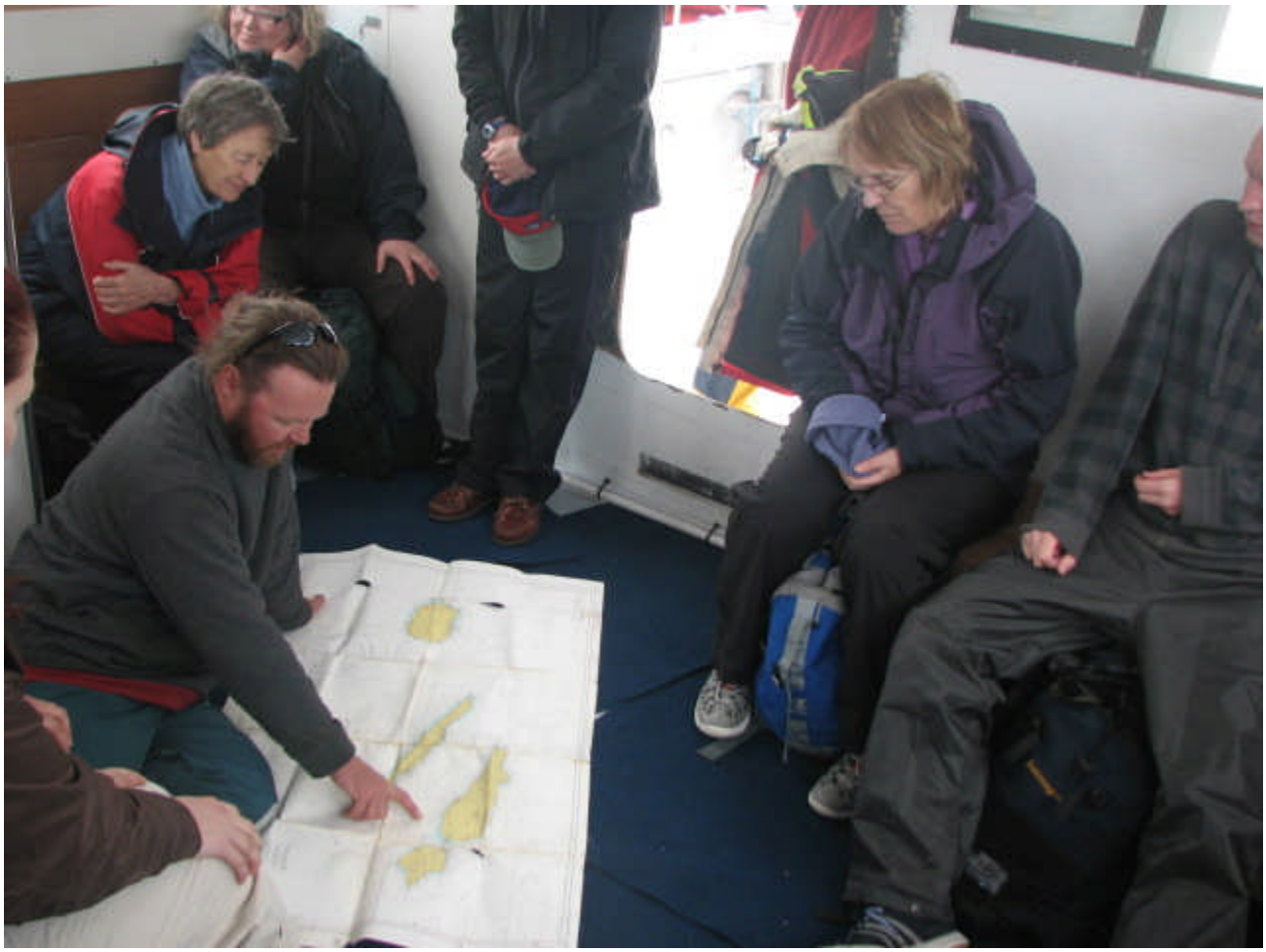


Fig. 2.2d. Debrief.

Results were analysed using EXCEL data analysis tools: summary statistics to obtain average group sizes and ranges.

2.3. Results

2.3.1. Effort

The Physeter normally left the harbour around 09:00 and return around 16:00 weather permitting. The boat went to sea 17 days during the expedition and spent between 2 and 7.25 hr per day on the water, with an average of 4.5 hr. A total of 78.5 hr with sea conditions less than sea state 5 were recorded. A comparison of the yearly effort since 2004 is presented in Fig.2.3a. It should be noted that prior to 2009, expedition slots were 13 days and have since been reduced to 10 days. Also note that in 2009 there were no expedition slots in May.

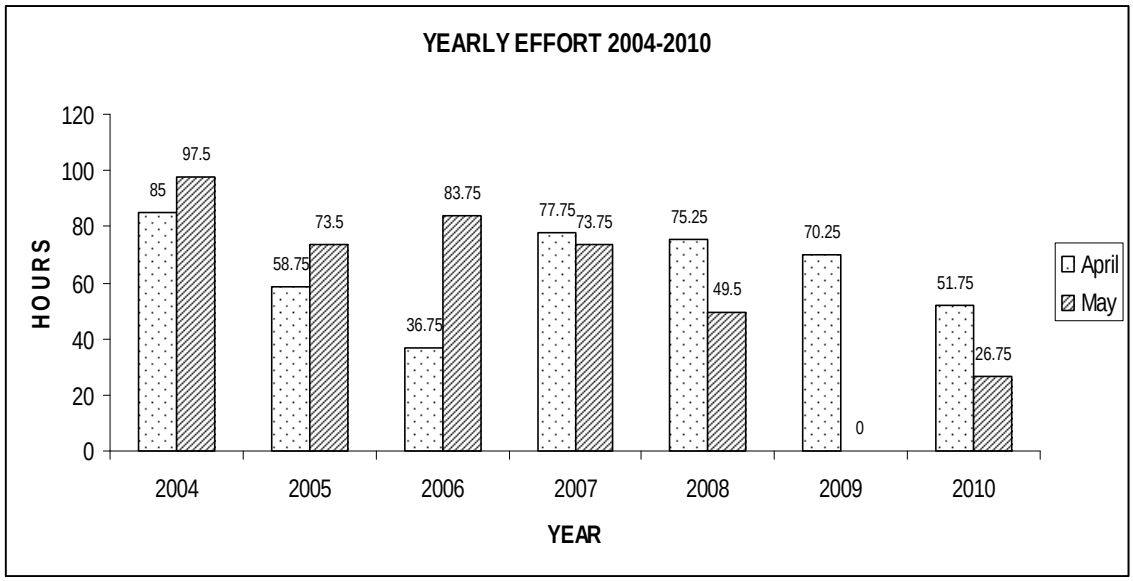


Fig. 2.3a. Yearly effort.

2.3.2. Encounters

During the expedition 35 groups of dolphins, 17 groups of non-sperm whales and 92 sperm whale groups were encountered (Table 2.3a.).

Table 2.3a. Species encountered.

COMMON DOLPHIN, *Delphinus delphis*	25
BOTTLENOSE DOLPHIN, *Tursiops truncatus*	4
RISSO'S DOLPHIN, *Grampus griseus*	3
STRIPED DOLPHIN, *Stenella coeruleoalba*	3
BLUE WHALE, *Balaenoptera musculus*	3
FIN WHALE, *Balaenoptera physalus*	9
SEI WHALE, *Balaenoptera borealis*	4
HUMPBACK WHALE, *Megaptera novaeangliae*	1
SPERM, *Physeter macrocehpalus*	92

These encounters resulted in a relative sightings frequency as shown in Fig 2.3b. Sperm whales were the species encountered most at 63.9%, followed by common dolphin and fin whales. These three species accounted for 87.6% of all sightings. Sperm whales were omitted from the chart below to give a better scaling.

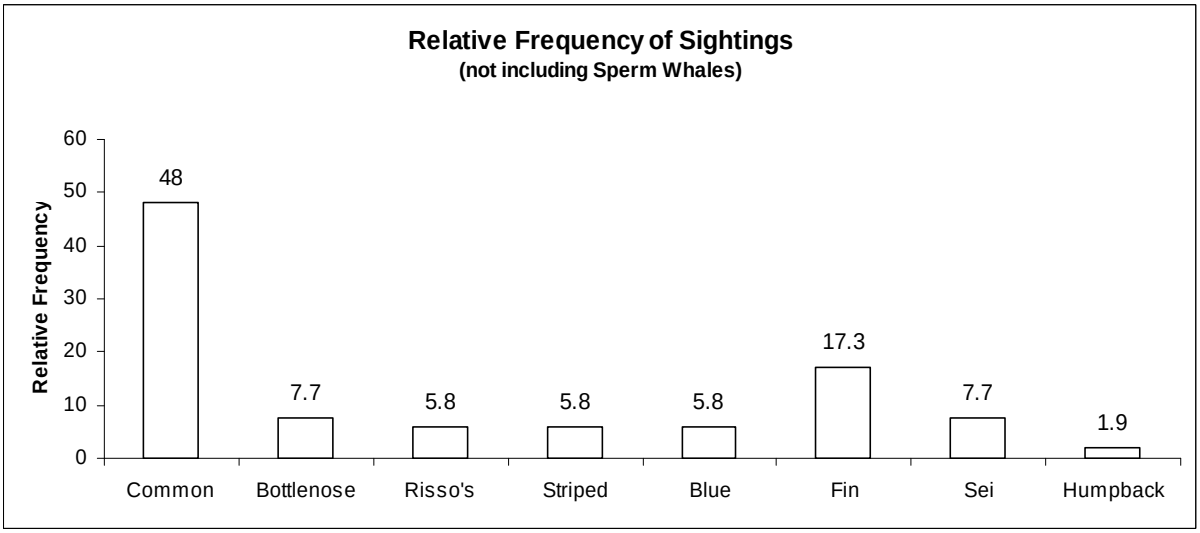


Fig. 2.3b. Species sightings frequency (excluding sperm whales).

2.3.3. Species sightings

Common dolphin

This species was encountered 25 times. The group size ranged from 1-200 and the average group size was 48.4 (Fig. 2.3c). This group size is not significantly lower than the average group size from existing data for June-September. Calves were first observed on 8 April and seen 8 times in total during the expedition. Several calves were observed with the foetal folds visible on their flanks, a sign that the animal was not more than a month old. There was no significant difference in group size when calves were seen in the group: an average of 55 versus 45.8 when no calves were present in the group. This is a different result than that found in other years, but due to the small sample size obtained, this year is not a reliable indicator.

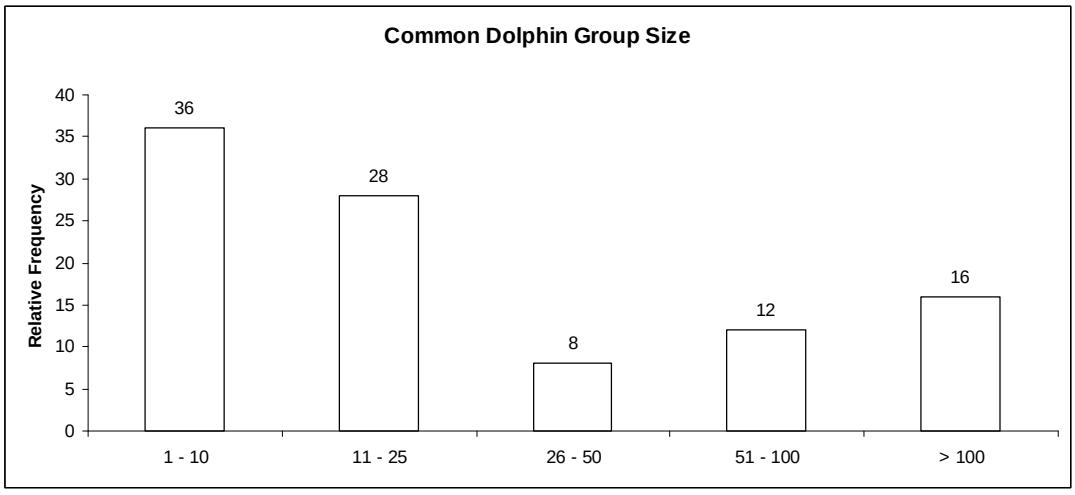


Fig. 2.3c. Common dolphin group size.

The most common behaviour observed by common dolphin was milling followed by bowriding then travelling. They were seen feeding only three times (Fig. 2.3d).

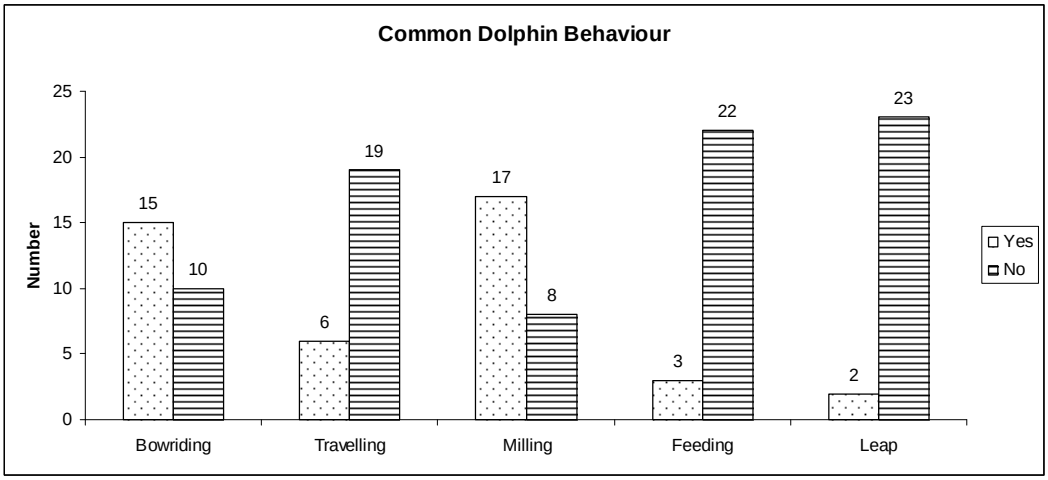


Fig. 2.3d. Common dolphin behaviour.

Bottlenose dolphin

This species was observed four times. The group size ranged from 5-50 and average group size was 36.25 (Fig. 2.3e). This is higher than the average of 27.3 seen when considering previously collected data. Calves were seen on three of the four sightings. Group size was significantly larger when calves were present, but given there was only one sighting without calves, this may not hold true with more observations. Bottlenose dolphins were most frequently observed bowriding and then travelling (Fig. 2.3e).

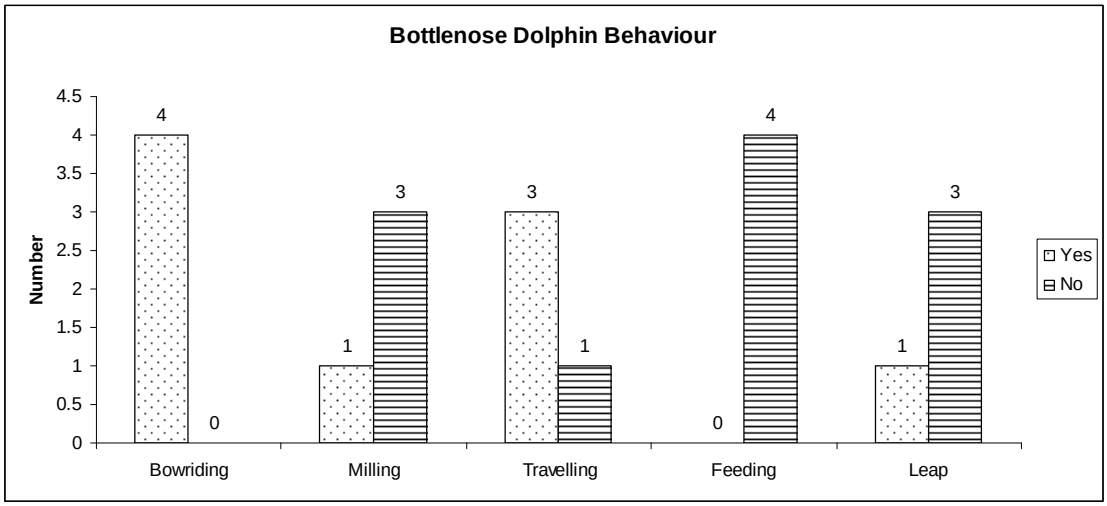


Fig. 2.3e. Bottlenose dolphin behaviour.

Photo identification pictures were taken for the groups observed and some of the resident animals were seen (Fig. 2.3f). However, these photos will be analysed at a later date.

Fig. 2.3f. Bottlenose dolphin photo ID.

Risso's dolphin

This species was only observed three times. All on the 20 April. Average group size was three ranging from two to four. No calves were seen.

None of the usual resident animals were seen during this expedition. (Fig. 2.3g). "Naked Lady" and ""F Nick" popular with past expeditions, were not seen during the 2010 expedition, but they have both been seen since the end of the expedition. The animals that we observed are new to the Risso's dolphin catalogue kept on Pico. They were all adult animals based on the colouration patterns observed on their bodies. Risso's dolphin become whiter as they age, and these were in the third out of four categories, adult-marbled. The fact that no calves were observed may indicate that these individuals are males.

Fig. 2.3g. Risso's dolphin dorsal fin photo ID.

Behaviour of Risso's during two of the three encounters was travelling, on the remaining encounter the group was milling.

Striped dolphin

Striped dolphins were also only seen three times. Average group size was 21.67, ranging from 20-25, which is smaller and significantly different from the average group size we have observed in the past. There were no calves seen during any of the encounters. All of the groups were milling and one group rode the bow. No feeding or leaping was observed.

Blue whale

Blue whales were observed on three occasions. All sightings were of single individuals milling. Identification photos (Fig. 2.3h) were taken of all three animals and sent to Richard Sears, who is the founder of the Mingan Island Cetacean Society and keeper of the North Atlantic blue whale catalogue, for matching to the Atlantic catalogue. No matches were found.

Fig. 2.3h. Blue whale ID photos.

Fin whale

Fin whales were seen on 9 occasions. Group size ranged from one to five with an average of 2.1 (Fig. 2.3i). No calves were observed.

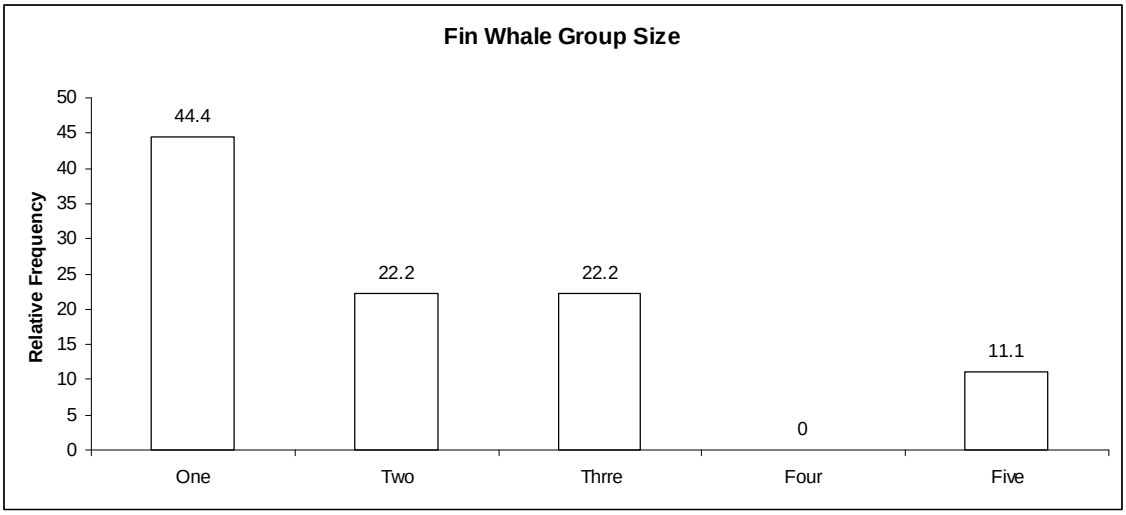


Fig 2.3i. Fin whale group size

Photo identification pictures of the chevrons and dorsal fins were obtained (Fig. 2.3j) and these photos were sent to the College of the Atlantic (www.coa.edu/nahwc.htm) based in Maine, for matching to their Atlantic catalogue They mainly keep images of North Atlantic humpback whales but now have also started a fin whale catalogue for the North Atlantic. No matches were found.

Fig. 2.3j. Fin whale ID photos.

Behaviour of the fin whales was either milling or travelling (Fig. 2.3k). On one encounter the whale may have been feeding, but this was not able to be confirmed.

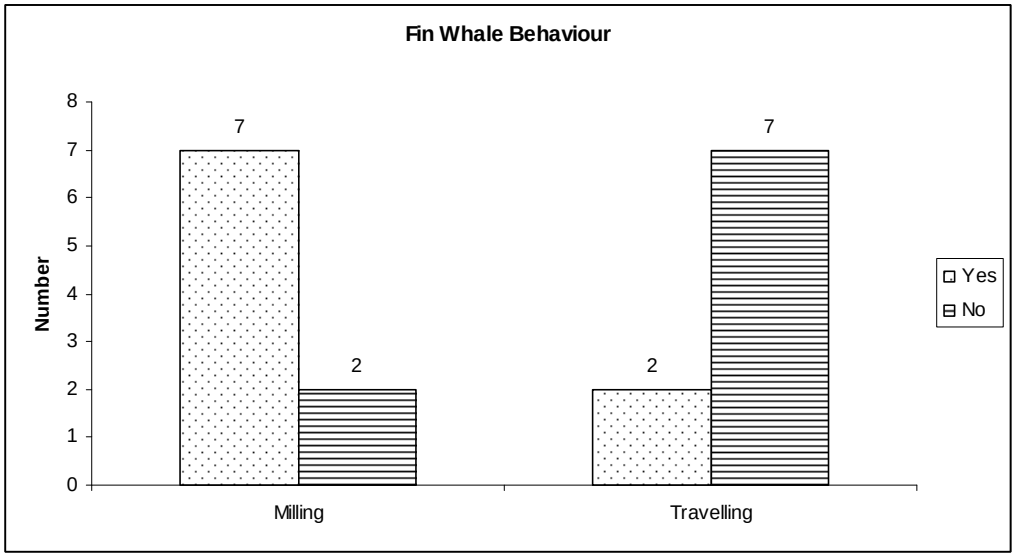


Fig. 2.3k. Fin whale behaviour.

Sei whale

Sei whales were encountered four times. Group size was either one or two with an average of 1.5. A single mother-calf pair was observed. Twice the whales were milling and on the other two occasions they were travelling. ID photos of the dorsal fins were taken for individual identifications (Fig. 2.3l). These photos will be analysed at a later date.

Fig. 2.3l. Sei whale photo ID.

Humpback whale

Humpback whales were observed once during the expedition on 5 May. The unique observation was of three individuals, two adults and a large calf, socialising at the surface. Fortunately, two of the animals fluked and identification photos were taken. They were sent to the College of the Atlantic for matching to the Atlantic Humpback Whale catalogue. A match was found to an animal photographed in the Cape Verde Islands on 20 March 2010 (Fig. 2.3m)!

Fig. 2.3m. Humpback whale fluke ID.
Top Azores photo, bottom same animal around Cape Verde.

Sperm whale

Sperm whales are one of the main target species of the expedition. They were encountered 92 times comprising 133 animals (not all different individuals). The average group size was 1.44, ranging from 1-5, which is similar to that encountered during other parts of the summer. Calves were observed 22 times and big males in 16 encounters. Photographs were taken of all whales which fluked up. Individuals can be recognised by the nicks and scallops formed on the trailing edge of the tail, due mainly to wear and tear as the flukes beat through the water. Forty-seven individuals were identified in total, 34 new animals and 13 from previous years. We had a few outstanding sperm whale days with 9 individuals identified on one day and 7 on another day! This year's IDs include 1501 and 1612, previously observed in 1991, as well as 2044, observed for the third time during a Biosphere Expeditions study (Fig. 2.3n).

1501

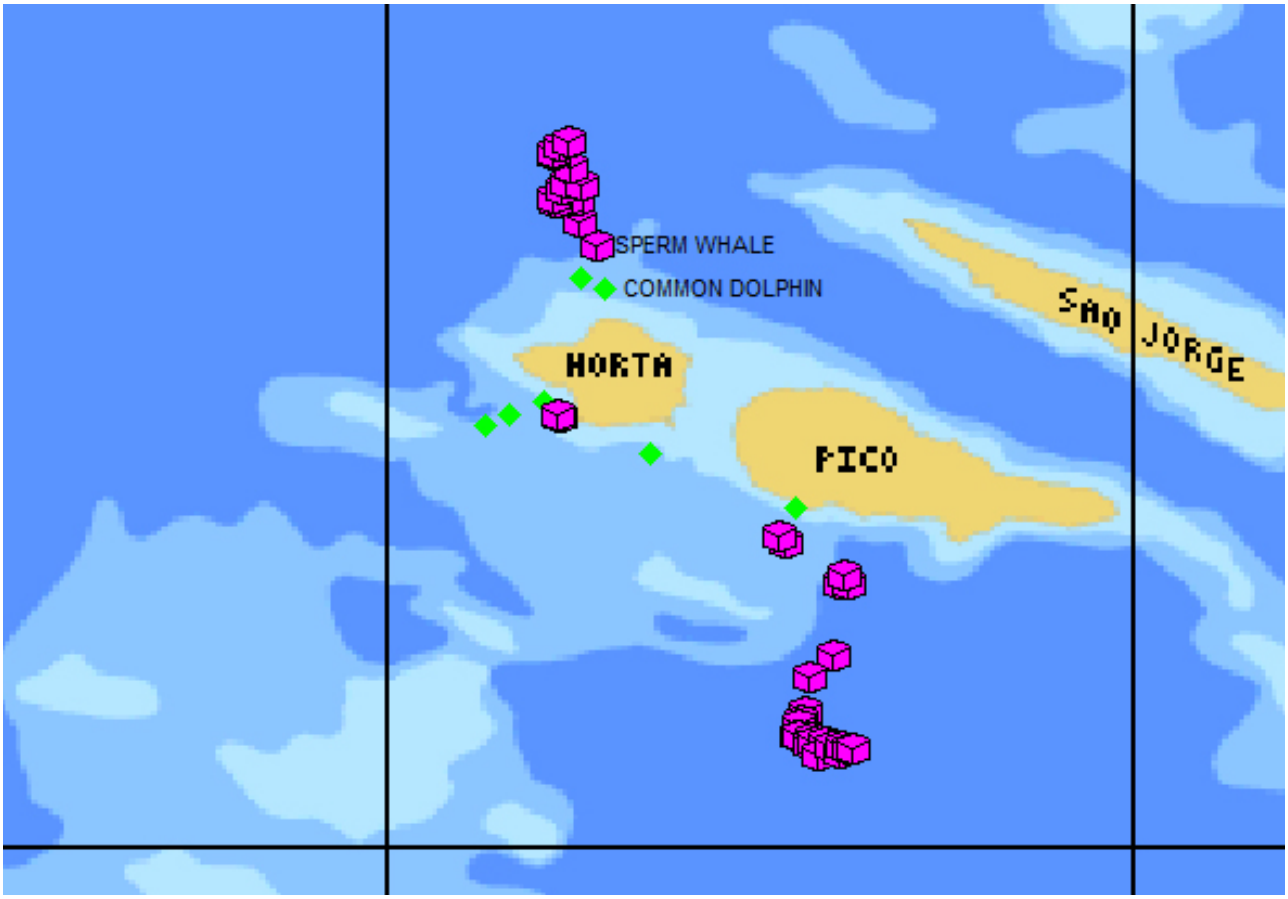
1612

2044

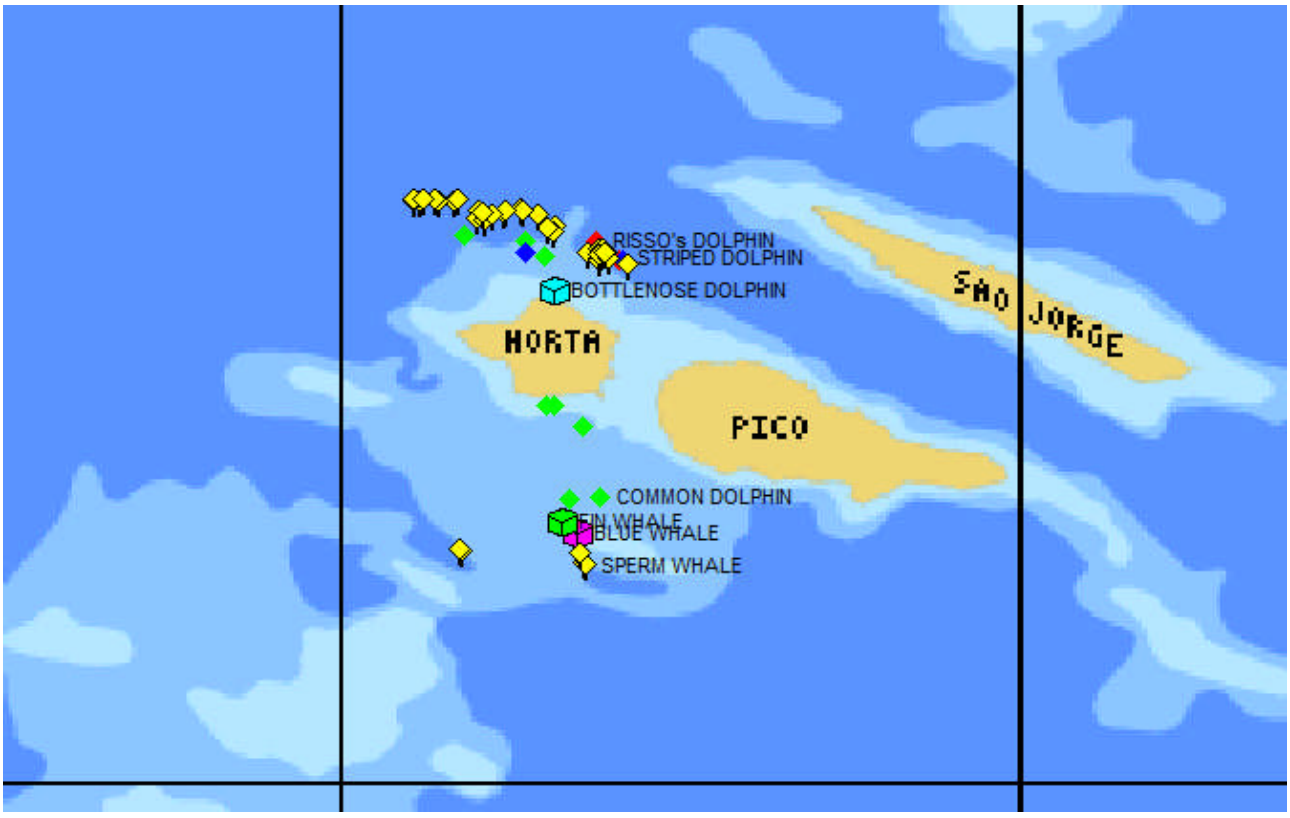
Fig. 2.3n. Sperm whale ID photos.

No attempts at skin collection were made, due to abundance of Portuguese man of war jellyfish and weather conditions that made it unsuitable for entering the water.

Sightings during the expedition



Slot 1



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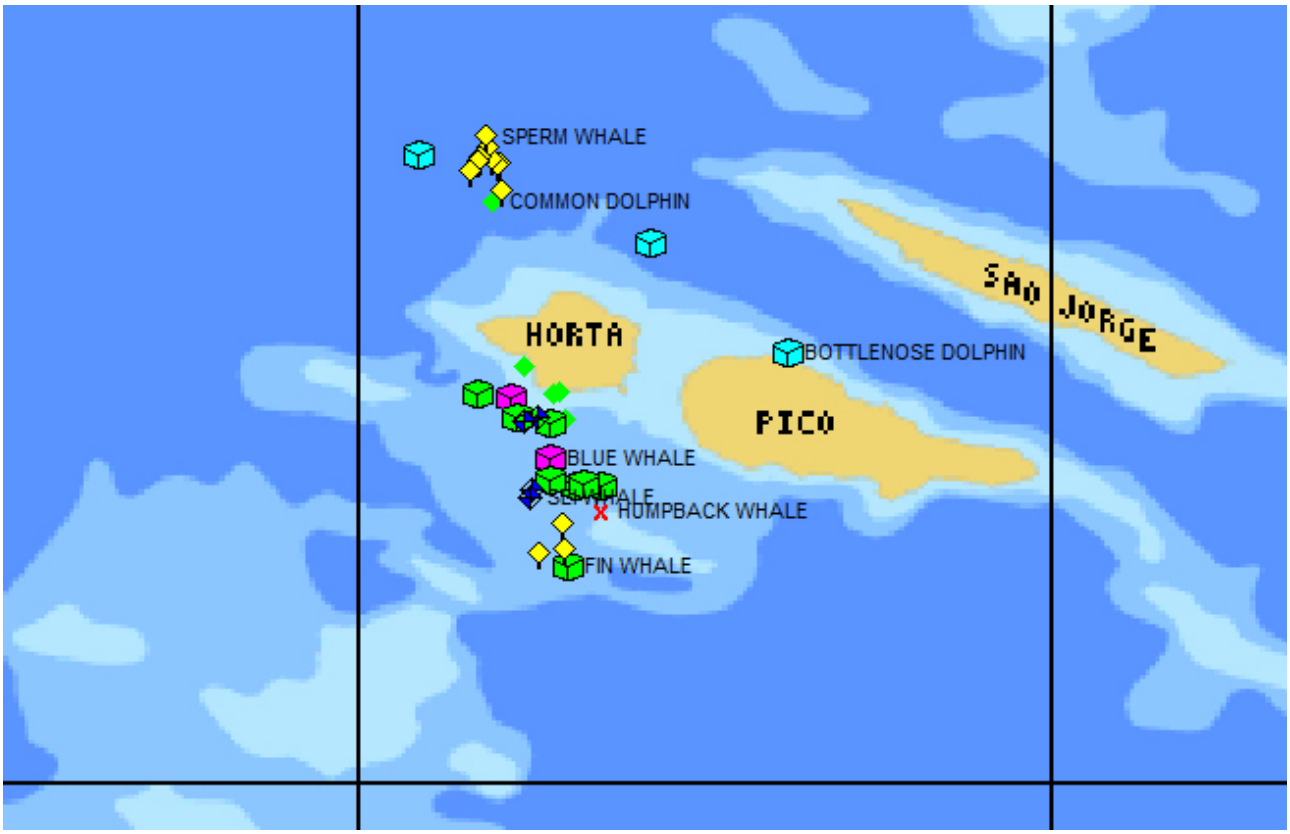

Slot 3

2.4. Discussion & conclusions

April and May are a productive time in the Azores. Biosphere Expeditions are playing an important role in collecting vital information at a time of year when little or no work has been done in the past. Many species of cetacean can be observed in the archipelago. In fact, the variety of cetaceans is usually greater at this time of year than any other time of the summer. Although sightings of baleen whales are unpredictable, the use of lookouts (vigias) on the cliffs greatly enhances the chance of sighting them.

There were more sightings of baleen whales this year in comparison to last year. The most interesting of those sightings was the three humpbacks, which resulted in a match to an animal seen around the Cape Verdes islands just over a month before we encountered them, showing that the whale travelled approximately 2,500 km distance in 46 days. This is the second match from the Azores humpback whale catalogue (only about 15 animals) to an individual in the Cape Verdes. The previously matched animal was photographed in the Azores in 2006 and has now been photographed twice in the Cape Verdes, once in 2009 and again this year, accompanied by a calf. With so few animals photographed in both the Azores and the Cape Verdes it is difficult to make any definite conclusions from these two sightings. These findings may indicate that the humpbacks from the Cape Verdes pass by the Azores on their migration to feeding grounds in the North, using the islands as a landmark. Which feeding grounds they are heading for is not clear. There has only been one match from the Cape Verdes to Iceland, but the Eastern Atlantic humpbacks may be using a feeding ground more off the beaten path of whale watchers/researchers than their counterparts in the Western Atlantic. Needless to say, all humpback photos will continue to be matched via the College of the Atlantic.

This year there were multiple sightings of blue, fin and sei whales, unlike last year. ID photographs were sent to the respective catalogues (apart from sei whales), but no matches were found. This photo ID project is important to continue, because as more photos are added to the catalogues from around the Atlantic, the pieces of the puzzle may finally start to come together and give us an idea of where the baleen whales are coming from and where they go to feed. To date there has been one match from the Azores to Iceland for a blue whale (although not our photo). Whale Watch Azores always get a big thank-you from the people responsible for the catalogues and they continue to tell us what an important contribution our baleen whale photos are, since the Azores may be a route marker for animals travelling north. Most researchers will not risk coming to the Azores to find baleen whales, because their migration patterns are just too unpredictable. They could come to the islands for a couple of months and not find a single animal. We have the luxury of already being in place and with the vigia (lookout) network, if the animals are present, we can take advantage of any opportunities that present themselves.

This year's sightings of the resident bottlenose and Risso's dolphin were down from previous years. It is thought that there was more food offshore in the spring, since we did receive some reports from fishermen and in fact sightings of these two species improved over the rest of the summer. The three small groups of Risso's that we sighted over a three hour period on a single day, may in fact be from the same group. These animals are not known from the catalogue of residents that is maintained on the island of Pico. So it may be that some new males were entering the area searching for females. It is thought that the males and females of this species live in separate groups and the males compete for the females. There has not been much effort by the catalogue holder to the North of Pico, so it is possible that the animals we saw spend more time North or West of Pico and Faial. The Risso's photo ID pictures have again been sent to the Risso's Project, to be added to their catalogue of resident animals they see frequently throughout the summer. So in future if these animals are seen, there will be a record of where they were last observed. Since our boat covers a larger area of the sea than the Risso's project, this collaboration enables us to obtain an idea of how far the Risso's dolphins range from their usual area and what other habitats might be important to them.

Sperm whales were again sighted frequently, including many females with suckling calves, as has been observed in previous expeditions, as well as several big males. Before the Biosphere Expeditions project began, we expected that it would be mainly large males that would be encountered in this early part of the summer, but this has again proven not to be the case, although we do tend to see more males in the spring than the rest of the summer. Males were observed 16 times during this expedition (not all different individuals). This year all of the males were sighted alone at the surface, but may actually have been in groups of two or three since a few different males were seen on the same day. This is normal for very large males; the older they get the more solitary they become.

In October 2009, Steiner et al. (2009) presented a poster on the movements of male sperm whales around the Atlantic, at the Marine Mammal Conference in Quebec (with financial assistance from the Friends of Biosphere Expeditions). Three of the males seen in the Azores were matched to animals re-sighted in Norway in 2007 and 2008. This has given us the first indication of where the males we observe may go when they are not in the Azores. This collaboration with biologists working in Norway is continuing, but none of our males from this year's expedition matched to Norway or elsewhere.

Data collected at this time of year are valuable to see if some of the same individuals remain in the archipelago for long periods of time. In fact, several of the animals sighted during the expedition were re-sighted during the summer, a couple of animals in June and then a few more in October. There is some indication that more “unknown” individuals are present in the early part of the season with the “known” animals arriving later. Whale 2044 was again observed during this year’s expedition. She has been in the catalogue since 1995, but has now been observed three times by Biosphere Expeditions! It may be that she is a “winter” whale, because she is one of the whales that were also observed in October of this year. It would be very interesting to see which individuals are present in the archipelago over the winter. Maybe some groups prefer to summer in the Azores and others the winter. The weather in the winter would be the main obstacle to investigating this theory, but a winter research period should be considered.

Seeing re-sighted animals this early in the season shows that some of the sperm whales that return to the area do not have a seasonal preference and can be seen in all months or they possibly move around the archipelago all year round. The animals re-sighted again this year reinforce the idea that groups of sperm whale females remain together for long periods of time. Usually when one animal from a group has been seen before, the rest of the animals in the group have also been seen. Sometimes it is not possible to identify all the animals of a group on a given day, but repeated sightings of the same group over time give more chances to catalogue all of the individuals from that group. We have begun collaboration with two whale watching companies that operate out of Saõ Miguel as well as renewed collaboration with one of the companies from the South of Pico. Several matches exist between the catalogues, indicating that there is movement of the animals around the archipelago.

In 2009 a Ph.D. thesis by Ricardo Antunes was completed at St. Andrews University, using the Azores photo ID database of individuals from 1987 to 2007 (Antunes 2009). The thesis analysed the social structure of sperm whale groups found in the Azores, looking at long-term relationships between individuals and patterns of residency around the archipelago. The author has shown that there are differences between the groups of sperm whales observed here to those in the Pacific. The groups of animals we observe in the Azores are more stable and associations of individuals last for a much longer period of time than they do in the Pacific. This is believed to be due to different food sources as well as reduced predation by orcas in the Atlantic.

Two collaborative projects are currently underway with the University of the Azores looking at the sightings of the sperm whales as well as the baleen whales with respect to environmental data collected by the university (depth, slope and tide as a few examples).

In conclusion, this expedition was a success for the seventh year running. Sightings were good and several days of sperm whales kept us occupied collecting data. More sperm whales than baleen whales were observed and there were fewer dolphins around than in previous years. Reports from some of the yachts arriving into Horta and from fishermen indicated that more dolphins were observed further offshore this year during the expedition. Sightings of Risso’s and bottlenose dolphin did improve later in the summer, but sightings of the smaller dolphins were again low overall. The weather conditions during this year’s expedition were reasonable, although a few days were spent out at sea in sea-states of 3 or more. This makes spotting the animals, especially dolphins, difficult for observers on the boat, as well as for the vigias on land.

Re-sighting individual sperm whales from previous years continues to show the value of the Europhlukes matching programme alongside digital cameras. We are able to identify individuals sighted on the day they are seen, rather than waiting until the end of the summer to do the matching manually. This is also a very satisfying way to end a day's work of observations!

The most interesting result of all for the expedition though, is the second match of a humpback whale to the Cape Verde Islands!

Thank you to all expedition members for your assistance.

2.5. References

Antunes, R. (2009) Variation in Sperm Whale (*Physeter macrocephalus*) coda vocalisations and social structure in the North Atlantic. PhD. Thesis. University of St. Andrews. 123p.

Steiner, L., L. Lamoni, M. Acosta Plata, T. Lewis, C. Beer, J. Gordan, L. Pettersson, M. Domingo, E. Lettevall, S.-K. Jensen (2009) Long Distance Movement of sperm whales, *Physeter macrocephalus*, in the North Atlantic: including new matches between the Azores and Norway. Poster Presentation. The Society for Marine Mammalogy Conference, Quebec City, 2009.

3. Observer Programme for the Fisheries of the Azores (POPA)

Miguel Machete
Department of Oceanography and Fisheries of the University of the Azores / IMAR – Sea Institute

3.1. Introduction

The Biosphere Expeditions research project took place between 3 April and 10 May 2010 in Faial Island (Azores, Portugal). Onboard of the vessel “Physeter”, several participants had the opportunity to collect some information on marine life of the Azores. During the expedition period, members of Biosphere Expeditions recorded the occurrence of several marine species such as marine turtles, baleen and toothed whales, dolphins and several species of seabirds (see figures below). The information recorded during the expedition will be processed and included in the database of the POPA (Observer Programme for the Fisheries of the Azores).

POPA was launched in 1998 with the main goal of certifying the tuna caught around the Azores as a “Dolphin Safe” product. This label is attributed by the NGO *Earth Island Institute* to catches made without mortality of cetaceans. POPA has built an extensive database with information collected by the observers on board the tuna fishing vessels. This database includes information on tuna fisheries (*e.g.* location of fishing events, catches, and fishing effort), weather conditions (e.g. SST, wind and visibility), live bait fisheries (e.g. location of fishing events, catches, gears used), cetaceans (e.g. occurrences, interaction with fishing events and association with other species), birds and sea turtles (e.g. occurrences). POPA is also responsible for “Friend of the Sea” tuna fishery certification.

3.2. Results

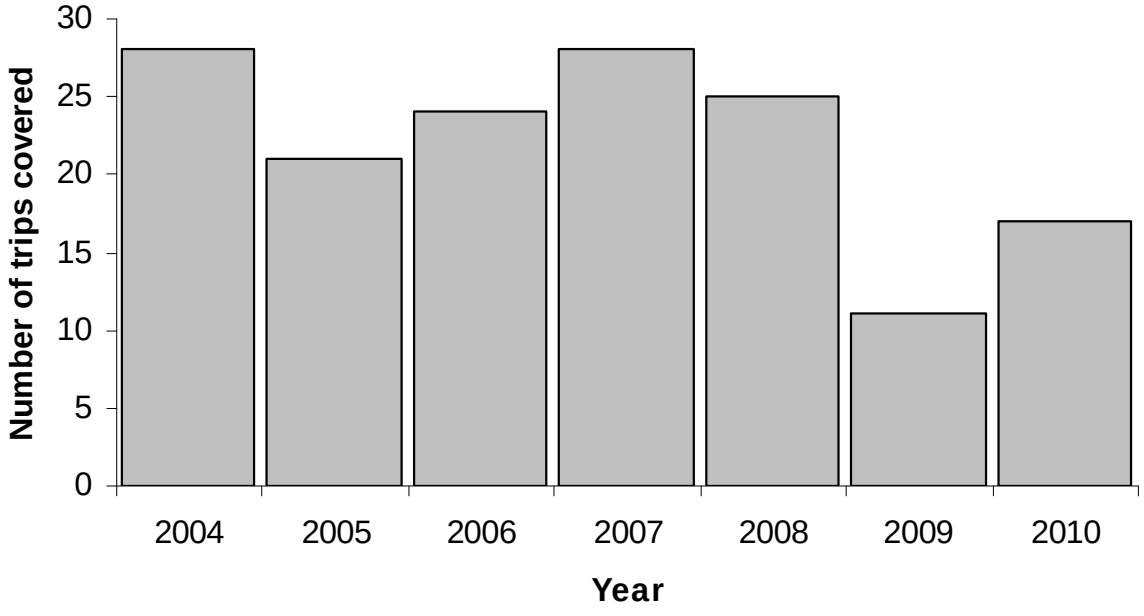

Figure 3.2a. Trip coverage in the 2004-2010 period.

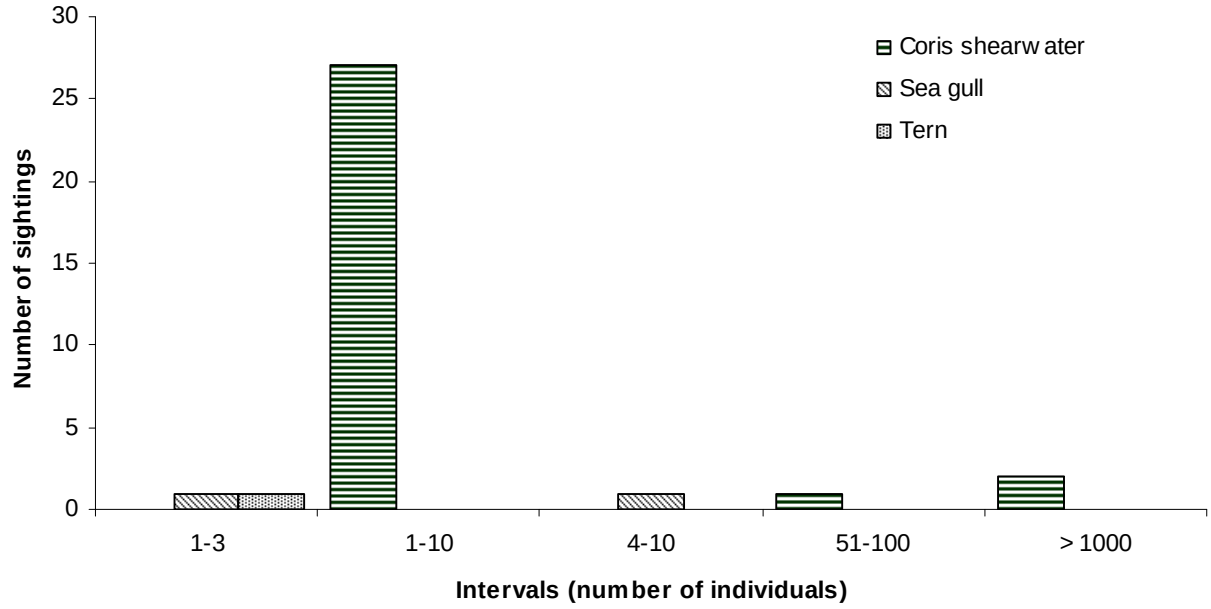

Figure 3.2b. Species of seabirds observed in 2010.

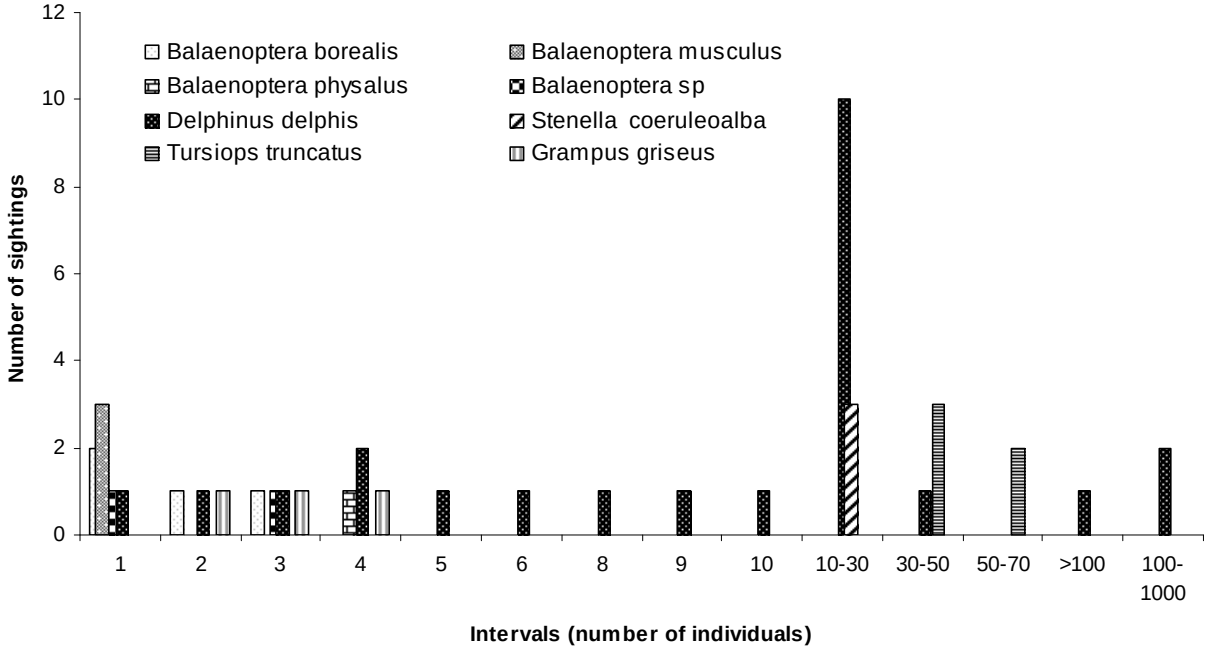

Figure 3.2c. Species of cetaceans observed in 2010.

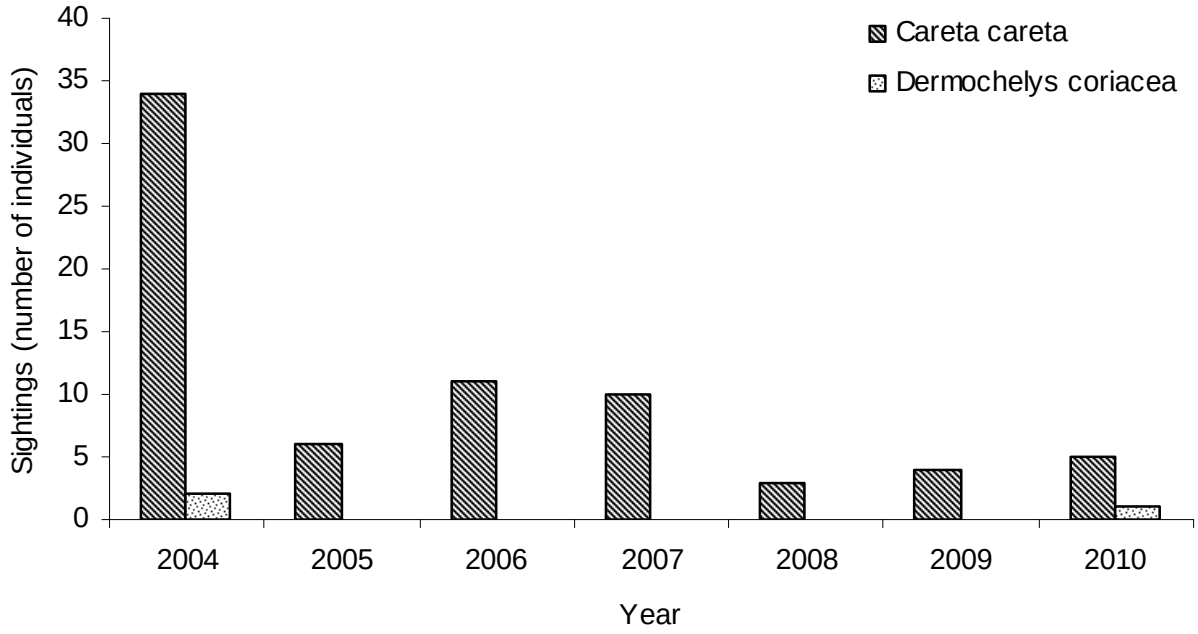

Figure 3.2d. Species of turtles observed in the 2004-2010 period.

4. Expedition leaders' diary: Azores 2009 by Kathy Wilden & John Highmore

1 April

I arrived yesterday at Horta on the island of Faial, greeted by bright sunshine and the sight of the volcanic cone of Pico covered with snow. It has warmed up here over the last week after a hard winter, so although the days are sunny there is still a chill in the air - so bring warm things!

I'm unpacking the expedition kit and going through the work that we will be doing with Lisa, our scientist, and Chris, who is in charge of the boat and a lot of the logistics. With all the shops closing tomorrow for Good Friday we will be shopping today and ensuring we have all the paperwork we need, and that our base at Casa do Lado (or Azores Ecolodge, as it is also known) is fully prepared.

I look forward to seeing the first team on Saturday. As it says in the dossier, I'll be at Peter's Café at 11.30 on Saturday morning to have some lunch, so if anyone would like to join me that would be great. If not, I'll see you all at the official meeting time between 13.00 and 14.00 at Casa do Lado. I hope you all have good journeys and if you need to contact me before we meet, please call my Portuguese mobile on +351 96 2338060.

See you soon

Kathy Wilden
Expedition leader

6 April

We have just got in from our first full day at sea and our first sighting of dolphins. There were around 200 common dolphins feeding in a group, which was an amazing sight. During part of our training on Sunday we were taken through the different types of dolphins and whales that we are likely to come across, so we knew what they looked like, but the speed that they move at was a big surprise to me. They are amazingly agile creatures, which can go up to around 20 knots and are very sociable, so you often see a group of several hundred all zipping around together. It is quite a sight, especially when they are feeding in between lots of seabirds as the group that we saw was.

We also encountered a turtle that was very close to the boat, but he had no intention of being picked up for tagging, so we watched him expelling the air in his stomach so that he could dive away from us (something that Chris and Lisa had talked about in our training). We had been passing hundreds of Portuguese Man of War jelly fish during the day (there are a lot going past the islands at the moment), which are very nasty, and which are eaten by turtles. The air in the turtle's stomach comes from trying to digest these creatures, so some of us were cheering on our turtle as it went through the process of burping the air out before it could dive.

The weather has not been very good so far. We did our initial training on Saturday and Sunday and managed to get out in the boat on Sunday afternoon, but Monday was a shore day due to the winds and the rain. We had another excellent talk from Lisa, our scientist, that morning and then spent the rest of the morning working on the computers, identifying individual animals from photographs and matching their pictures, plus entering some data collected pre-computers! That afternoon was free for a wander around Horta, but a number of very dedicated members of the team carried on with the computer work. We have made a good dent in this work already and some of the names of the individual Risso's dolphins are brilliant.

As I write this the forecast for the morning is good, so fingers crossed for another full day at sea and some more sightings.

9 April

We've had a busy few days, starting on Wednesday (7th) with our first encounter with sperm whales. The seas were still quite 'confused', a term our captain has used in previous days, which seems to mean 'a bit all over the place' and 'quite bouncy', but the forecast of good weather for the day was broadly right. We headed North in sunshine, pausing briefly for an encounter with some common dolphins, and then continuing out to about 3 miles from the island when the first shout of 'Blow' went up. This means that someone has seen the spray of water that comes out of a whale's blow hole. The hunt (if you'll pardon the expression) was on. With all eyes on the sea looking in the direction that our observer was pointing, everyone scouring the sea for the next 'blow' so that they could see the whale.

Sperm whales blow roughly every 10 to 15 seconds, so it wasn't long before we were able to locate the animal and manoeuvre to a good distance away. The whale was one of several in the group. We counted 7 different individuals and at least 2 calves with their mothers. The whales were appearing on the surface, remaining there for around 10 minutes, and then diving again, all appearing at different times, so that we could observe one and then another and then another. By the end of the encounter we had been with the whales for 2 hours and had followed their movements further out to sea, so that we had quite a long, and by then, very boisterous ride home in some very damp conditions. An exhilarating end to the day.

On Thursday we woke to another rather damp morning but set off out to sea with the promise of better conditions off shore. The seas were calmer than they had been at the beginning of the week and as we headed up to the north of Faial, the clouds parted to warm sunshine. Today we went back to the area that we had seen the whales the day before and dropped the hydrophone over the stern to see if we could pick up any sounds of sperm whale activity. We stop every 15 minutes for 1 minute to listen to the underwater sounds without the noise of our own engines interfering. The hydrophone is set to listen specifically in the frequency range that the sperm whales communicate in and it can pick up animals as far as 8 miles away. Because it is set up this way it does not pick up the sounds made by the baleen whales, but it can pick up some dolphin communications. Unfortunately for today, our pod from the day before had moved on, and there were no sperm whales to be heard in our area. We did, however, have a pleasant time at sea with good conditions for collecting data on some common dolphins that were spotted at the northern tip of the island, but otherwise a quiet time was had.

Friday offered us the promise of the best conditions that we have had for the whole slot. On the way to the boat spirits were high, but an unfortunate accident left us sadly short-handed. One of the team had a nasty fall in the marina on her way to the boat and had to get into a car and head for medical assistance rather than heading out to sea (more of this later).

The rest of the team headed out to sea following information from the vigias (look outs who are positioned on the cliffs) who had told us that sperm whales had been sighted 10 miles off the coast of Sao Caetano, one of the villages on the south side of Pico. As we headed out, we saw the first of 4 turtles that day (loggerheads) and shortly after passing the port of Sao Mateus we encountered a small group of common dolphins which we watched briefly before returning to our 'quest for the holy whale' (this is a new phrase that our captain has coined). After around 2 hours we came upon the whales as expected but around 8 miles past their reported position. The group consisted of one male with a large number of females and calves and we were able to make 19 observations of animals over the course of the next two and half hours. There were likely to have been more whales there, but as the whales come up from their dives at different times it is difficult to be sure about the exact numbers. The group was also lucky enough to collect and tag the first turtle of this year, a loggerhead turtle with a shell (carapace) size of around 45 cm in diameter. All in all a brilliant day at sea.

So back to our casualty on land.....arriving at Horta hospital at around 9 am there was luckily almost no waiting in casualty and so our intrepid team member was whisked into a room, checked out by a doctor, x-rayed several times, checked out by another doctor, and then asked to wait to see a further doctor who was an orthopaedic surgeon but was in surgery at the time. A rather prolonged wait, a consultant visitation, a declaration of no bones broken and then a hard splint, directions not to put any weight on it for at least 2 weeks, injections and instructions for painkillers and crutches, and she was free to go.....about 2pm, not bad considering!! Our patient was tough throughout, but unfortunately unable to go to sea again.

13 April

We have just waived off the last of the expedition team members at the end of a tough but rewarding slot. The weather for the last couple of days remained quite windy so we didn't get out on Saturday but did end our time with an exciting day on the Sunday by tracking a whale underwater. We used the hydrophone and heard one whale somewhere underwater, and then used its directional abilities to work out where the whale was so that when he came up from his dive we were waiting right by to make our observations and get some good pictures of his fluke as he dived back down. He was a big solitary male and, as one team member put it, it was 'awesome'.

I was very sorry to see the team leave. Everyone has worked hard and put up with some not so good weather with a smile on their face. We only had two days when we didn't go to sea, which was great. The numbers that we saw also speak of a successful time: 5 turtles, with one tagged; 12 different encounters with dolphin and 490 animals seen, plus 29 encounters with sperm whale which were made up of a total of 48 animals. A big thank you to slot 1 and I look forward to meeting slot 2 on Saturday (Peter's Café at 11.30 or at Caso do Lado between 13.00 and 14.00).

22 April

I think it's safe to say that the volcanic eruption in Iceland took us all by surprise. Inevitably, it meant that some of the Slot 2 team members weren't able to travel to the Azores as planned, and we would like to extend our full sympathies to them. However, we were very pleased to welcome those who did make it past that troublesome ash cloud to Horta on Saturday morning.

The new team was able to get out to sea the following afternoon, although rough weather and 'sloppy seas' (a technical term for bad weather) led to a bumpy ride on the boat. There was a similar sea-state the following day, but this was soon forgotten when several sperm whales and a pod of common dolphin made their appearance.

Tuesday dawned sunny and clear, so we put out to sea bright and early for what proved to be a very productive day of research. In the space of seven hours we logged no less than eleven separate sperm whale sightings, plus observations of common dolphin, bottlenose dolphin, striped dolphin and the more reclusive Risso's dolphin.

Wednesday was an equally valuable day: five sightings of sperm whale, which were located using the hydrophone; playful pods of common dolphin; and the first observation in the Azores this summer of a fin whale. But wait… what does that enormous 9-metre spout of water over there indicate? Why, it is none other than that mighty leviathan of the deep, the blue whale! All of us were awestruck by the rare chance to observe the largest creature that ever lived, here in its natural environment. We are agreed that this is one of the most incredible wildlife encounters we are ever likely to experience.

The team members are now enjoying a well-earned day of shore-leave, and are taking the opportunity to explore the beautiful island of Faial.

Best wishes from the Azores,

John (and Kathy)

25 April

A full day at sea on Saturday saw the team log sixteen valuable encounters with sperm whales. This allowed us to gather data on eleven separate cetaceans, including two pairs of mothers with calves. One of the team was also fortunate enough to observe a young sperm whale throw its body above the surface of the sea in a spectacular 'breach'.

The weather in the Azores is notoriously changeable, but on days when it has been too rough to put to sea, the team has been ably employed in various important research projects at the expedition base in Horta. Friday saw half the team engaged in comparing photographic records of the dorsal fins of various dolphins and whales that have been observed in this region and logging the data on the computer for further analysis. The other team members assisted Lisa (our scientist) in cataloguing the profiles of sperm whale flukes and analysing these with the help of a computer programme to determine the frequency of each animal's appearance in these waters. Work of this nature continued on Sunday. In addition, Lisa gave a presentation about the ongoing turtle research with which Biosphere is providing assistance.

The team is now looking forward to a farewell meal in a restaurant on the seafront, where the end of a successful phase of the expedition will no doubt be celebrated in style. Kathy and I would like to thank all the team members for their hard work and dedication during the past eight days of research. A wealth of beneficial data has been gathered, and everyone can leave Faial knowing that they have made a positive impact in the field of conservation in the Azores.

Tomorrow we will also bid farewell to Kathy Wilden, who has ably led the first two slots of this project. I would personally like to thank her for all her advice and hard work in preparing me to take over the leadership role during the final slot. I hope everyone has a safe trip home; and Lisa, Chris and I will look forward to welcoming the new team in just a few days' time.

Meantime, happy Portuguese Independence Day from Horta!

4 May

A truly international team arrived in Horta on Saturday for Slot 3 of this year's Azores expedition, comprising participants from as far afield as England, Wales, Germany, Belgium, Portugal and the USA. Their first afternoon at sea proved to be a truly memorable one, for various reasons...

Sunday was one of the team member's (Leslie's) birthday, and her birthday wish was simple: she wanted to see a blue whale. Obviously we couldn't make any promises, but at 14.22 precisely, what should appear on the horizon? None other than Balaenoptera musculus himself: a young adult blue whale, moving with graceful majesty through the steely grey waves. He proceeded to make everyone's day by displaying his tail flukes as he dived below the surface. This magnificent display is seldom observed, but the team were lucky enough to witness it no less than three times in one afternoon.

Not to be outdone, three fin whales chose to make an appearance. As the team recorded their blow-rates and behaviour patterns, a shout of amazement went up as a pod of common dolphin was then seen bow-riding in the fin whales' wake. Surely this had to be the culmination of the day's performance? Oh no- there was more to come! Lisa's sharp eyes picked out a turtle which was swimming within ten metres of our boat; not any old turtle though- it was an extremely rare leatherback turtle. In some eighteen years of research in the Azores, Chris and Lisa have only ever seen four or five of these creatures here before. Needless to say, the team felt very privileged to have observed such an amazing conglomeration of animals within the space of just a few hours. And Leslie's birthday cake? One in the shape of a blue whale, of course!

A popular tradition in the Azores is for boat crews and expedition teams to paint a mural on the wharf in commemoration of their visits to the islands. After a morning spent learning the requisite computer skills for converting observations into scientific data, the team members decided to venture outside and to have a go at painting a logo of their own. (An artistic design had already been created by the Slot 1 team, and the Slot 2 team members had put down two layers of undercoat, in an area close to the murals produced by previous Biosphere teams). The artists made an admirable first attempt, before adjourning for an informal debrief in Horta's world-famous sailors' haunt, Peter's Cafe Sport.

The following day was once more spent at sea, in pursuit of more cetacean sightings. With the aid of the hydrophone (a shipboard underwater microphone system) five sperm whales were soon located, including three young adult males who were socializing by swimming vertically in close proximitry to each other, intermittently raising their heads up above the surface of the sea. In addition, a pod of common dolphin gave us a fine display of leaping and diving, which met with encouraging cheers from the team.

A large amount of valuable data has been gathered during these past few days, and each team member already has many marvellous memories from their time with Biosphere in the Azores. Here's to many more in the coming days!

6 May

...And still the species tally continues to rise! As our vessel the 'Physeter' put to sea on Wednesday, a flying fish whizzed across our bows and glided for some fifty metres across the surface of the ocean. We took this as a good omen. Less then half an hour later, we found ourselves in the midst of a spectacular 'feeding event'. As many as five thousand Cory's shearwaters were wheeling and swooping over the sea between the islands of Faial and Pico. The sea's surface was flecked with large orange patches of krill, and Chris (our skipper) informed us that large shoals of tuna and other fish would be feeding beneath the waves, drawing the birds to this location.

As we passed beyond the huge flock of seabirds, a cry of, "Blow!" went up from the foredeck as the faint puff of mist which indicates a whale's spout was observed. We drew closer, and Lisa was able to identify the species as humpback whale - the first time they have been observed in these waters this year. The team succeeded in photographing the distinctive tail flukes of three individuals, and a few days later Chris was able to provide feedback as follows:

"Hot off the press (and still unofficial), Lisa sent the three humpback pictures to the main guy on this species over in the States and he is pretty confident that one of them was seen in the Cape Verdes on 20th March this year. Very Exciting! This is EXACTLY what Bisophere is here for, and to find this out during the expedition is fantastic."

It seems that good luck often comes in threes. The next species of whale to be observed that same day was the fin whale, with three individuals photographed and monitored by the team. Then came our first sighting of sei whales- the third-largest of the rorqual group of baleen whales. We pursued a group of three for some distance, monitoring their behaviour and taking photographs for identification purposes.

The following day included further sightings of fin whales and sperm whales, with Chris's eagle-eyes also picking out the rapid movements of a shark, which darted in front of our boat before disappearing from sight with a flash of its grey fins. We also made three separate sightings of juvenile loggerhead turtles.

Then, as we turned to head for home, we saw the blue whale that we had observed on preceding days. Lisa has sent the details of these observations to a leading authority on blue whales (who is currently on a research trip in Pico), and he has confirmed that this is a new individual which was not previously included in the scientific catalogue for this region; another valuable contribution made by a Biosphere team.

The team members spent their shore-leave on Friday exploring the neighbouring island of Pico, with its stunning volcanic landscapes. Saturday morning saw them engaged in data entry and photographic analysis in the expedition's field office in Horta. Later that day they again ventured out to sea, logging observations of bottlenose dolphin, and a multitude of seabirds such as terns, petrels, gulls and shearwaters.

The plan is to conduct one more day of research at sea on Sunday, and I will include the results in the final diary entry from the Azores.

11 May

Final Diary Entry

The 2010 Biosphere expedition to the Azores has drawn to a successful close.

On the team’s final day at sea, observations were made of common dolphin, bottlenose dolphin and striped dolphin, as well as a group of four fin whales. Some excellent photographs were taken and a wealth of useful data was gathered.

The team enjoyed a celebratory farewell meal in a restaurant in Horta on Sunday night. A special presentation was made to George, who at 82 years of age was our most senior team member, in recognition of his hard work and team spirit. He has been an inspiration to us all.

It only remains for me to thank several people on behalf of Biosphere and the team members of all three slots: Vanessa and Dario from the field base at Casa do Lado for their unstinting hospitality; and Chris and Lisa, the scientific team who have shared their knowledge so willingly throughout the past few weeks, ensuring that each team member felt fully involved in a thoroughly worthwhile research project.

Here's to further successes in 2011!

Very best wishes,

John H.