



# EXPEDITION REPORT

Expedition dates: 7 April – 10 May 2014

Report published: November 2014

**Photo-identification and surveys of  
cetaceans in the central group of the  
Azores islands**





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## Photo-identification and surveys of cetaceans in the central group of the Azores islands

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November 2014**

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Biosphere Expeditions**

# Abstract

In 2014 Biosphere Expeditions concluded its eleventh 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 7 April to 10 May and concentrated on six main projects.

Sightings of all cetacean species were recorded. In total, 222 sightings of nine different species of cetacean and two species of turtle were recorded during the expedition period. Photo-identification of sperm whales, baleen whales and bottlenose and Risso's dolphins continued.

## Sperm whale photo-ID

Sperm whale photo-identification that has been ongoing since 1987 in the Azores continued, with 52 identifiable individuals photographed from 91 encounters, including 13 animals seen in previous years.

## Baleen whale photo-ID

Baleen whales, including blue, fin, sei and humpback, were seen with increased frequency over the last few years. This year there were many encounters with baleen whales. Several blue, fin and sei whales were encountered as well as humpback whales. ID photos were taken during all encounters and most of these will be analysed at a later date.

## Dolphin photo-ID

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

## Europhlukes

Europhlukes is a European-wide project that brings 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 for the Department of Oceanography and Fisheries (DOP) of the University of the Azores, for the Tuna Boat Observer program, POPA, were successfully collected for an eleventh 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 13 loggerhead turtles were seen; five of which were captured, tagged and released. A single leatherback turtle was also sighted, but not captured.

# Sumário

A Biosphere Expeditions 2014 concluiu com sucesso o seu décimo primeiro ano de recolha de dados sobre distribuição de cetáceos nos Açores, com recurso a observações visuais e foto-identificação. A expedição teve a sua base na Horta, ilha do Faial e o trabalho foi conduzido em torno das três ilhas do Faial, Pico e São Jorge. Esta expedição ocorreu entre 7 Abril – 10 Maio e concentrou-se em seis projectos principais.

Foram registadas um total de 222 avistamentos de 9 espécies diferentes de cetáceos e 2 espécies de tartarugas. Deu-se continuidade à foto-identificação de cachalotes, baleias de barbas, golfinhos roazes e golfinhos de Risso.

## Foto-identificação de cachalotes

Desde 1987 que está em curso nos Açores um programa de foto-identificação de cachalotes, com 52 indivíduos identificados e fotografados em 91 encontros, incluindo reavistamentos de 13 animais observados em anos anteriores.

## Foto-identificação das baleias de barbas

Os registos de baleias de barbas, incluindo baleia azul, baleia comum, sardinheira e baleia de bossas, foram mais frequentes nos últimos anos. Este ano foram comuns os encontros com baleias azuis, baleias comuns e sardinheiras tendo sido observada também baleias de bossas. As restantes fotos serão analisadas no futuro.

## Foto-identificação dos golfinhos roazes e Rissos

Continuámos a foto-identificação de roazes, que começou em 1987. Até ao momento conhecem-se 8 grupos de roazes e 8 grupos de Rissos que foram fotografados. Estas fotografias serão analisadas num futuro próximo.

## Europhlukes

Europhlukes é um projecto Europeu que reúne investigadores de diversos países para partilhar dados de foto-identificação de várias espécies. Todas as fotografias recolhidas no âmbito desta expedição serão enviadas para esta base de dados.

As extracções das caudas dos cachalotes fotografados durante a expedição serão comparadas com fotografias obtidas em anos anteriores e noutras áreas do Atlântico. Até ao momento nenhum dos cachalotes fotografado nos Açores foi reavistado noutras áreas.

## POPA

Pelo décimo primeiro ano foram recolhidos dados para o Programa de Observação dos Pescas nos Açores (POPA) coordenado pelo Centro do Instituto do Mar da Universidade dos Açores. O “Physeter” é a única embarcação que não se dedica à pesca comercial que contribui o POPA. A informação foi recolhida aleatoriamente ao longo de transectos de observação de cetáceos. Foram também efectuadas contagens de tartarugas, aves marinhas e recolhidos parâmetros ambientais.

## Tartarugas

As tartarugas *Caretta* são capturadas e marcadas nos Açores desde 1988, para um projecto conjunto entre a Universidade da Flórida e a Universidade dos Açores. Durante esta expedição, 13 tartarugas boba e uma tartaruga de couro foram avistadas, tendo-se marcado 5 tartaruga boba.

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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 and A. Stickler (editors)  
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](http://www.biosphere-expeditions.org).

This expedition report deals with an expedition to the Azores that ran from 7 April to 10 May 2014. 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 1,400 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. Accurate knowledge of the origins of the baleen whales passing the archipelago on their migration from March to May 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 1,400 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.



**Figure 1.2a.** 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, transatlantic flights and yachtsmen. The islands' main income is from agriculture and fishing; tourism has all but passed by the islands.

## 1.3. Dates

The expedition ran over three periods totalling three ten-day groups.

7 – 16 April | 19 – 28 April | 1 – 10 May 2014

Team members can join for multiple slots (within the periods specified). 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, near the harbour in a guesthouse consisting of modern en suite, twin and double rooms. Dinner was eaten at local bistros/restaurants, a breakfast buffet was served by participants on a rota and each participant prepared a lunch pack from the buffet. Vegetarians and some special diets were catered for. Accommodation was on a twin-share basis.

### Weather

The climate is mild maritime Mediterranean with average temperatures during the expedition months from 15° to 22°C. Extremes are usually buffered by the Gulf Stream passing by, but it can get quite cold, especially on the boat, with the wind chill factor.

### Field communications

The boat carried two radios for communication with other boats. Mobile phones did work on the island and within a few kilometres out at sea. There was also wireless internet access at base. The expedition leader also posted a [diary with multimedia content on Wordpress](#) and excerpts of this were mirrored on Biosphere Expeditions' social media sites such as [Facebook](#) and [Google+](#).

### 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 and had to be successfully invoked once for a minor medical emergency with no lasting after-effects.

## 1.5. Expedition scientist

Biosphere Expeditions works on this project with Lisa Steiner of Whale Watch Azores. Lisa 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.



## 1.6. Expedition leader

Alisa Clickenger was born in the United States and educated at Bennington College in Vermont. After many successful years in the corporate world, she fell in love with the path less travelled. She now lives a life of travel and adventure, and writes about it for several magazines. An experienced overlander on two and four wheels, Alisa has a love of nature and foreign cultures which in 2009 brought her on a seven-month solo journey through Central and South America seeking wildlife and wild places. An experienced tour guide in the adventure travel field, at Biosphere Expeditions Alisa realises a dream – that of combining her love of people with her love of wildlife and conservation.

## 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):

7 – 16 April 2014

Priscilla Bloomfield (USA), Jana Budková (Czech Republic), Sarah Burgon (UK), Alison Cox (UK), Catherine Edsell (Biosphere Expeditions staff, UK), Ton Geerts (Netherlands), Frances Hou (China), Duncan Powell (UK), Ryan Smith (USA), Katarzyna Smolinska (UK), Di Song (China).

19 – 28 April 2014

Justine Demers (USA), Jaco Devilee (Netherlands), Eva Fransen (Netherlands), Laura Hearnden (UK), Karin Kindbom (Sweden), Sonja Kling (Germany), Sebastian Kling (Germany), Catherine Milton (UK), John Munthe (Sweden), Simone Stadlbacher (Austria).

1 – 10 May 2014

Sue Daynes (Biosphere Expeditions staff, UK), Manuel Enes (placement, Portugal), Ann Gill (UK), Martina Hiller (Germany), Marilia Olio (placement, Portugal), Simon Pinson (Australia), Flávio Rodrigues (Portugal), Mónica Silva (placement, Portugal), Diana Tonova (Germany).

Placements were kindly supported by the Friends of Biosphere Expeditions.

## 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).

## 1.9. Expedition budget

Each team member paid towards expedition costs a contribution of £1,290 per person per 10-day slot. The contribution covered accommodation and meals, supervision and induction, special non-personal equipment, and all transport from and to the team assembly point. It did not cover excess luggage charges, travel insurance, personal expenses such as telephone bills, souvenirs etc., or 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.

<b>Income</b>	<b>£</b>
Expedition contributions	30,710
<b>Expenditure</b>	
<b>Base camp and food</b> includes all board & lodging, base camp equipment	7,385
<b>Research vessel &amp; transport</b> includes fuel, oils, wear & tear for research vessel, taxis on land	3,577
<b>Equipment and hardware</b> includes research materials & gear, etc.	32
<b>Staff</b> includes local and Biosphere Expeditions staff & expenses	7,717
<b>Administration</b> includes registration fees, sundries, etc.	120
<b>Team recruitment Azores</b> as estimated % of PR costs for Biosphere Expeditions	4,472
<b>Income – Expenditure</b>	<b>7,406</b>
<b>Total percentage spent directly on project</b>	<b>76%</b>

## 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 the Friends of Biosphere Expeditions for their sponsorship and/or in-kind support.

We would also like to thank our partners Europhlukes, the University of the Azores, POPA, the University of Florida, and the local community of whale spotters (vigias), as well as our skipper, Nuno.

## 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](http://www.biosphere-expeditions.org).

Enquires should be addressed to Biosphere Expeditions at [info@biosphere-expeditions.org](mailto:info@biosphere-expeditions.org).

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## 2. Whale, dolphin & turtle study

Lisa Steiner  
Whale Watch Azores

### 2.1. Introduction

The Azores is a group of nine 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 cetacean research 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 those taken elsewhere, hopefully to determine some of these migration routes. So far, there have been three matches between blue whales: one between Western Iceland in the 1990s and the Azores in 2006, another seen in the Azores 2012 & 2013 matched to Spitzbergen in 2014 and in 2014 a blue whale that had been seen in the Gulf of St. Lawrence, Canada in 1984 was seen off the south coast of Pico in June. Also, seven humpback whales have been observed in both the Azores and the Cape Verdes.

Although sperm whales were caught in 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 enabled us to show 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 3,000 individuals have been identified since then. The Europhlukes matching programme (see <http://www.cwi.nl/EUROPHLUKES>) makes matching individuals much faster than it was manually.

Some bottlenose and Risso's dolphins 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 these resident individuals. This requires a lot of time spent matching ID photos on the computer to identify individuals and their groups. Most of this work will be done in the future by MSc or PhD students.

## 2.2. Methods

Physeter (Latin for sperm whale), a 12 m motor catamaran, 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 09:00. If the lookouts did not sight any whales, the boat was equipped with 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 citizen scientists were usually dedicated to filling in POPA forms (transects and bird and turtle surveys) (Figure 2.2a). Other expedition participants were on camera (Figure 2.2b), data sheets, hydrophone monitoring (Figure 2.2c), filling in the log or collecting water temperatures when required. On occasion participants had to do more than one job.



Figure 2.2a. POPA sheet duty.



Figure 2.2b. Camera duty.



**Figure 2.2c.** Monitoring the hydrophone.

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 dolphins 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 100-400 mm lens and a Nikon F70 with a 70-300 mm lens.

Other dolphins sighted were approached for species identification and then the boat would usually move 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 them 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.

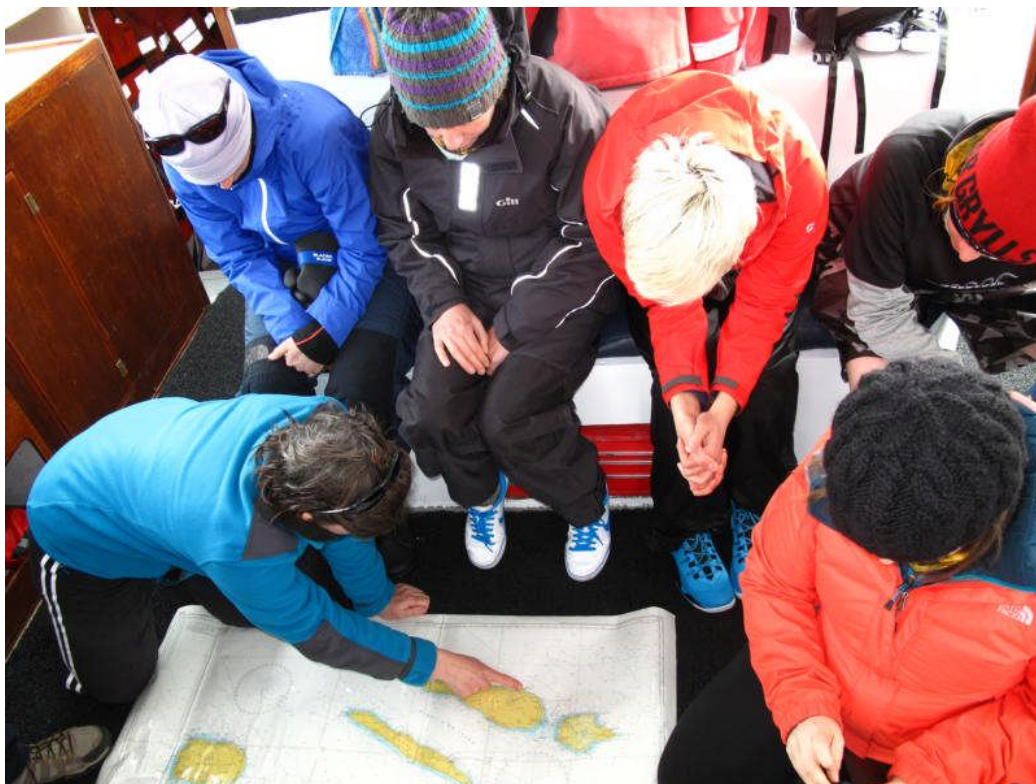
Data collected for sperm whale sightings included: date, start and end time, number of whales, number of calves (the calves also count in the whale column), if the calf was suckling, visible callous (a growth on the top of the dorsal fin which indicates the whale is female) or if the whale was male, position, fluke heading, defecation, recordings made and the presence of other whale watching boats.

When loggerhead turtles were sighted their position was recorded on the POPA forms. If the animal was caught, then it would be measured and tagged (Figure 2.2d) for the University of Florida/University of the Azores turtle tagging programme, as well as positional data being recorded.



**Figure 2.2d.** Turtle being measured and tagged.

When the boat returned to port, there was a debriefing on board to show where the boat had been during the day (Figure 2.2e) and later sperm whale photos could be matched to the catalogue (Figure 2.2f).



**Figure 2.2e.** Daily debrief.



Figure 2.2f. Matching flukes & fins.

Results were analysed using Excel data analysis tools such as summary statistics to obtain average group sizes and ranges.

## 2.3. Results

### 2.3.1. Effort

The *Physeter* would normally leave the harbour around 09:00 and return around 16:00, weather permitting. The boat went to sea for 18 days during the expedition and spent between 3.25 and 7 hours per day on the water, with an average of 6.1 h. A total of 110 h with sea conditions below sea state 5 were recorded. A comparison of the yearly effort since 2004 is presented in Figure 2.3a. It should be noted that prior to the 2009 expedition slots were 13 days and have since been reduced to 10 days. Also note that in 2009, 2011 and 2013 there were no expedition slots in May.

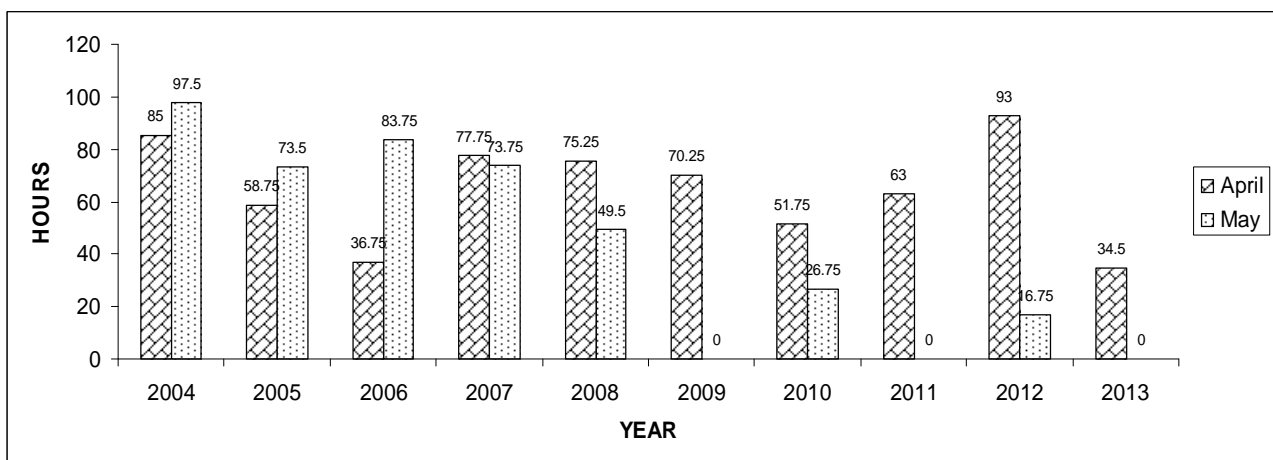


Figure 2.3a. Yearly effort.



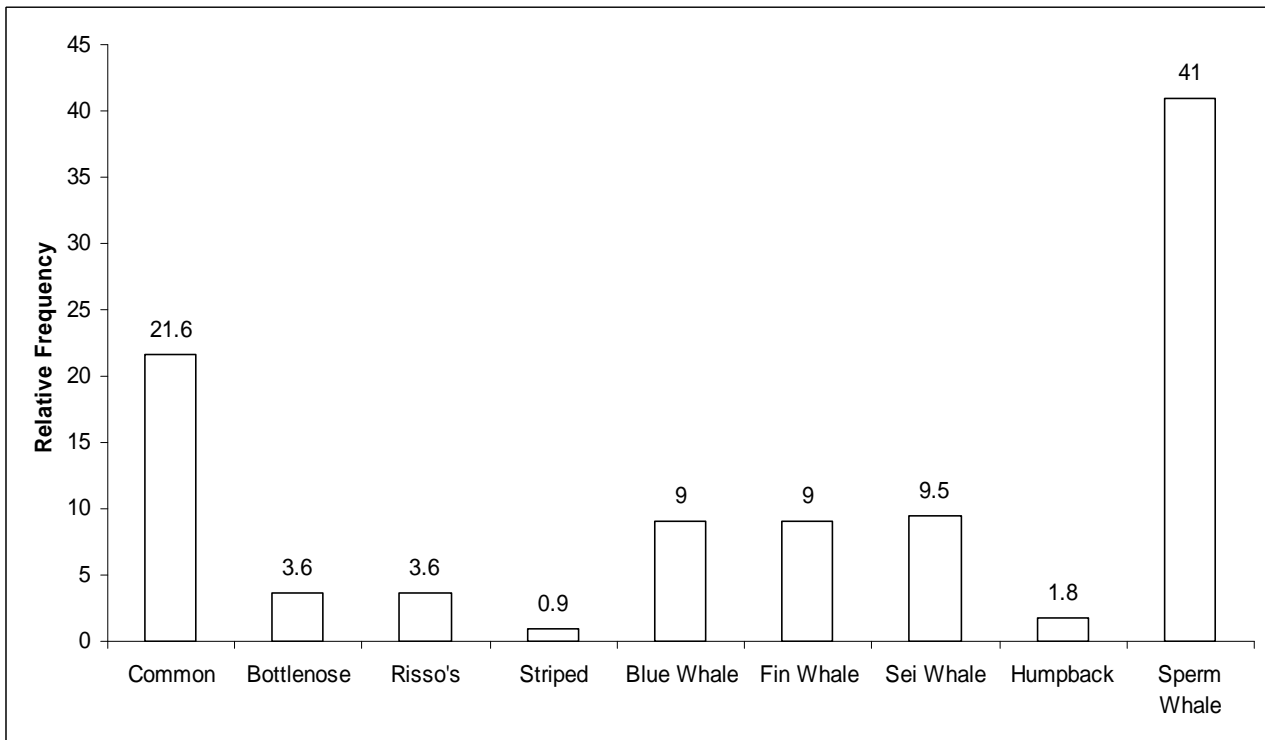
### 2.3.2. Encounters

During the expedition 131 groups of non-sperm whales and 91 sperm whale groups were encountered (Table 2.3a.).

**Table 2.3a.** Species encountered.

COMMON DOLPHIN, <i>Delphinus delphis</i>	48
BOTTLENOSE DOLPHIN, <i>Tursiops truncatus</i>	8
RISSO'S DOLPHIN, <i>Grampus griseus</i>	8
STRIPED DOLPHIN, <i>Stenella coeruleoalba</i>	2
BLUE WHALE, <i>Balaenoptera musculus</i>	20
FIN WHALE, <i>Balaenoptera physalus</i>	20
SEI WHALE, <i>Balaenoptera borealis</i>	21
HUMPBACK WHALE, <i>Megaptera novaeangliae</i>	4
SPERM WHALE, <i>Physeter macrocephalus</i>	91

These encounters resulted in a relative sightings frequency as shown in Figure 2.3b. Sperm whales were the species encountered most at 41%, then common dolphin (21.6%) and closely grouped sei (9.5%), fin (9%) and blue whales (9%). These five species accounted for just over 90% of all sightings.



**Figure 2.3b.** Species sightings frequency.

### 2.3.3. Species sightings

#### Common dolphin

This species was encountered 48 times. The group size ranged from 1 to 200 and the average group size was 33.8 (Figure 2.3c). This group size is smaller than the average group size from existing data for June–September (Steiner, unpublished data). Calves were first observed on 9 April and seen 11 times in total during the expedition. Several calves were observed with the foetal folds visible on their flanks, a sign that the animal is not more than a few months old. There was no significant difference in group size when calves were seen in the group: an average of 51 versus 28 when no calves were present in the group ( $t$ -test  $t > 0.05$ ). This is a different result to that found in most other years, but the same as 2010 and 2012. It is most likely due to the relatively small size of groups observed this year, as compared to other years.

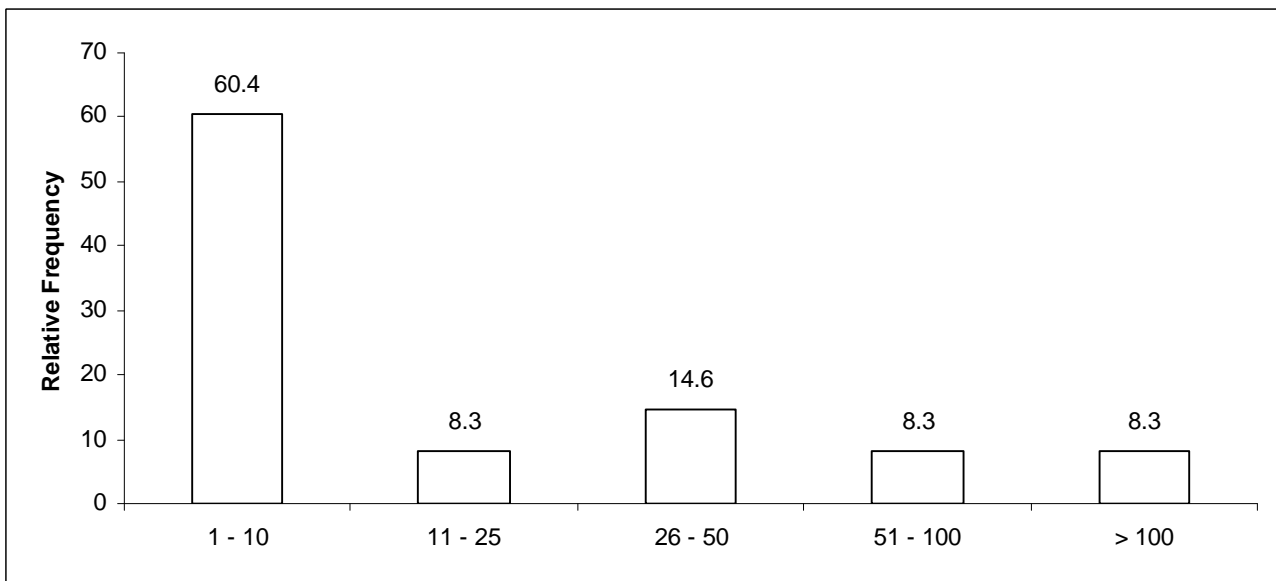


Figure 2.3c. Common dolphin group size.

The most frequent behaviour observed in common dolphins was milling followed by travelling, then bowriding. They were only seen feeding on three occasions (Figure 2.3d).

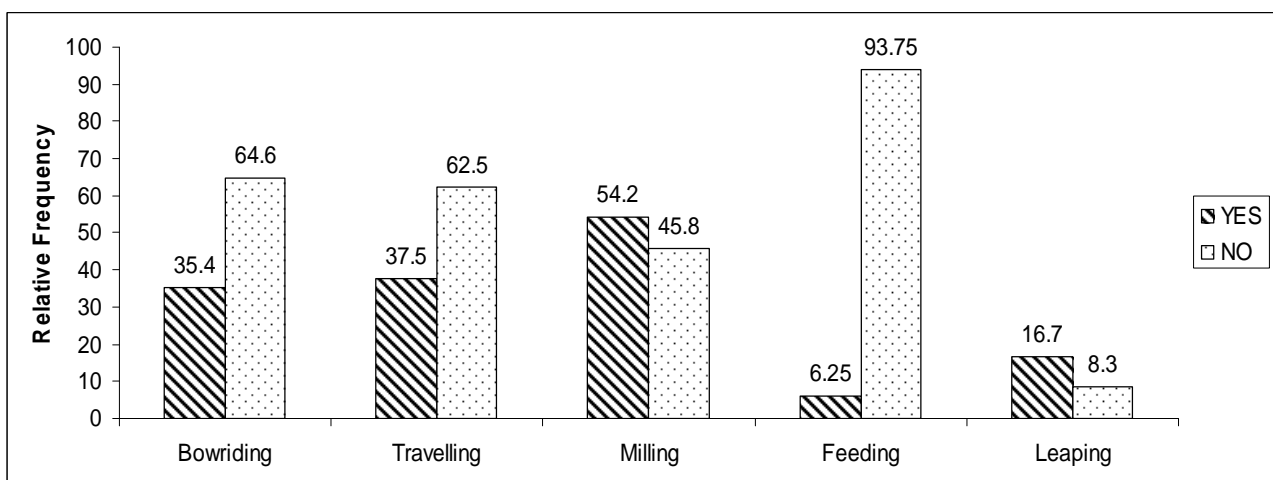
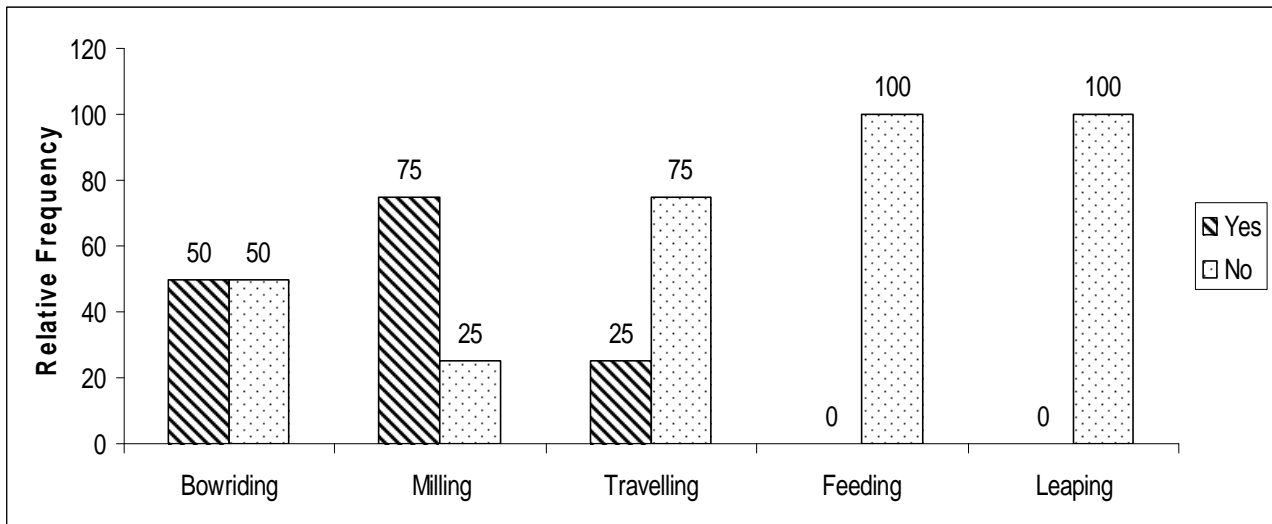


Figure 2.3d. Common dolphin behaviour.

## Bottlenose dolphin

This species was observed eight times. The group size ranged from 2 to 20 and average group size was 8.75. This is lower than the average of 27.3 seen when considering previously collected data. Calves were seen once during the expedition.

Bottlenose dolphins were most frequently observed milling and bowriding (Figure 2.3e). No feeding was observed.



**Figure 2.3e.** Bottlenose dolphin behaviour.

Photo-identification pictures were taken for the groups observed and some of the resident animals were seen (Figure 2.3f). Photos will be analysed in more detail at a later date.



**Figure 2.3f.** Bottlenose dolphin photo-ID.

## Risso's dolphin

This species was observed eight times. Average group size was 10.25, ranging from 4 to 20. Calves were seen twice.

Only a few of the usual resident animals were seen during this expedition. We saw two groups with calves. The top right photo of Figure 2.3g shows how few scratch markings are present on a calf compared to the other, adult individuals. Risso's dolphins become whiter as they age.



Figure 2.3g. Risso's dolphin photo-ID.

Behaviour of Risso's during five of the eight encounters was travelling; on the remaining three encounters the group was milling. No feeding was observed and Risso's dolphins do not generally bowride (Figure 2.3h).

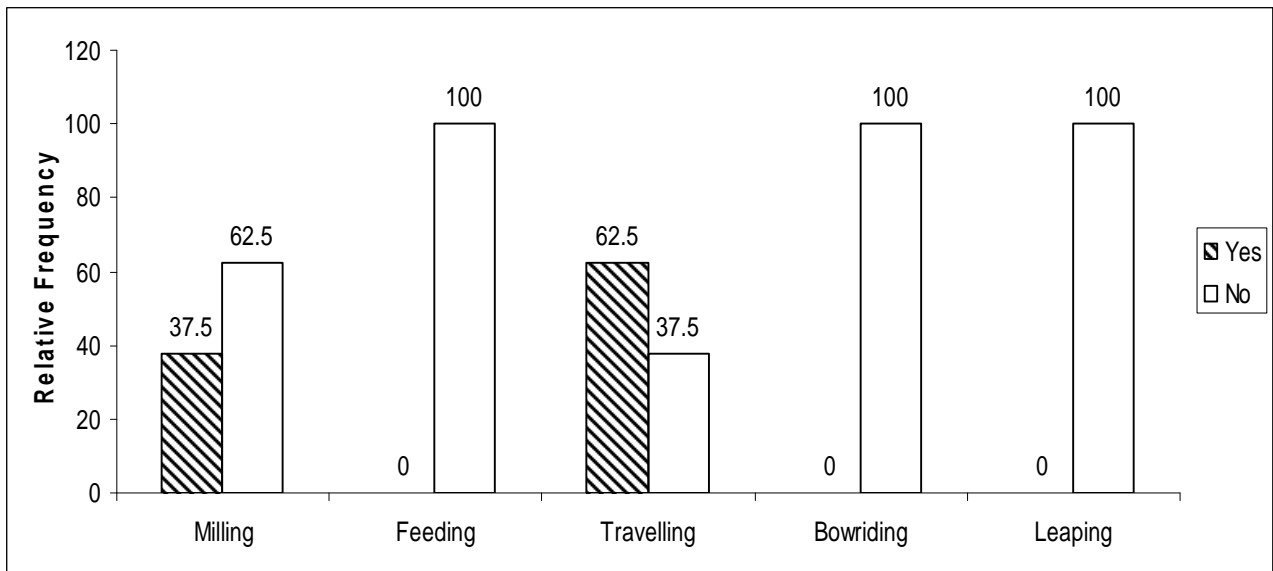


Figure 2.3h. Risso's dolphin behaviour.

## Striped dolphin

Striped dolphins were seen twice. One group was composed of 80 individuals and the other of 40. Calves were seen on both of the encounters. One group was milling and bowriding, while the other group was travelling. No feeding was observed.

## Blue whale

Blue whales were observed on 20 occasions. Average group size was 1.3 with a range of 1–3. Calves were not seen. Milling was seen more than travelling and blue whales were observed feeding on three occasions (Figure 2.3i).

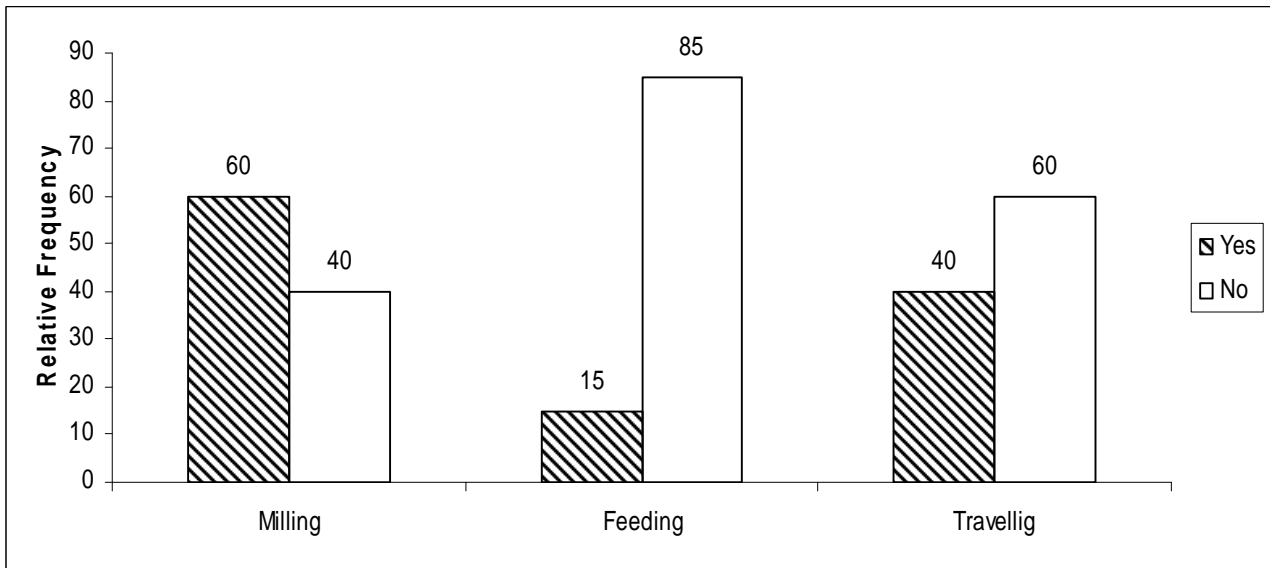


Figure 2.3i. Blue whale behaviour.

Identification photos (Figure 2.3j) were taken of all the animals and sent to Richard Sears founder of Mingan Island Cetacean Society, who has been studying blue whales in and around the Gulf of St. Lawrence for many years and is also the keeper of the catalogue for Atlantic blue whales, for matching. No matches are reported at the time of writing.



Figure 2.3j. Blue whale ID photos.

## Fin whale

Fin whales were seen 20 times during the expedition. Group size ranged from 1 to 3 with an average size of 1.8. Calves were seen on four occasions and a juvenile in another group. The behaviour of the animals was mainly travelling, with milling seen in seven encounters. They were thought to be feeding twice (Figure 2.3k).

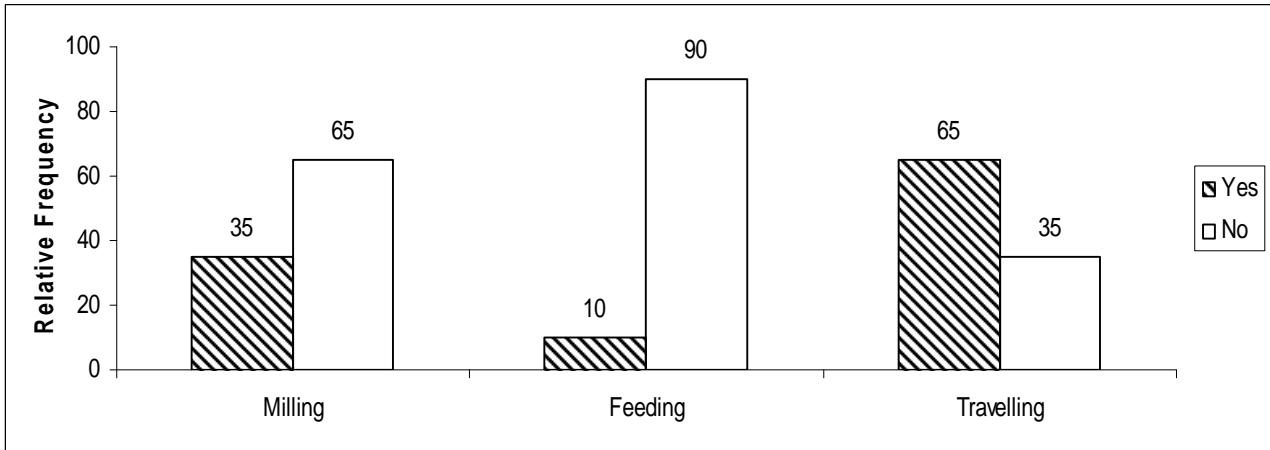


Figure 2.3k. Fin whale behaviour.

Photo-identification pictures of the chevrons (the light colouration patterns found on the right side of fin whales just behind the head) and dorsal fins were obtained (Figure 2.3l) and these photos were sent to the College of the Atlantic for matching to their Atlantic catalogue. No matches have been found so far.



Figure 2.3l. Fin whale ID photos.

## Sei whale

Sei whales were encountered on 21 occasions. Group size ranged from 1 to 9 with an average size of 1.8. No calves were observed; however, a juvenile was present in one of the groups. Their behaviour was split fairly evenly between milling and travelling, with feeding observed three times (Figure 2.3m).

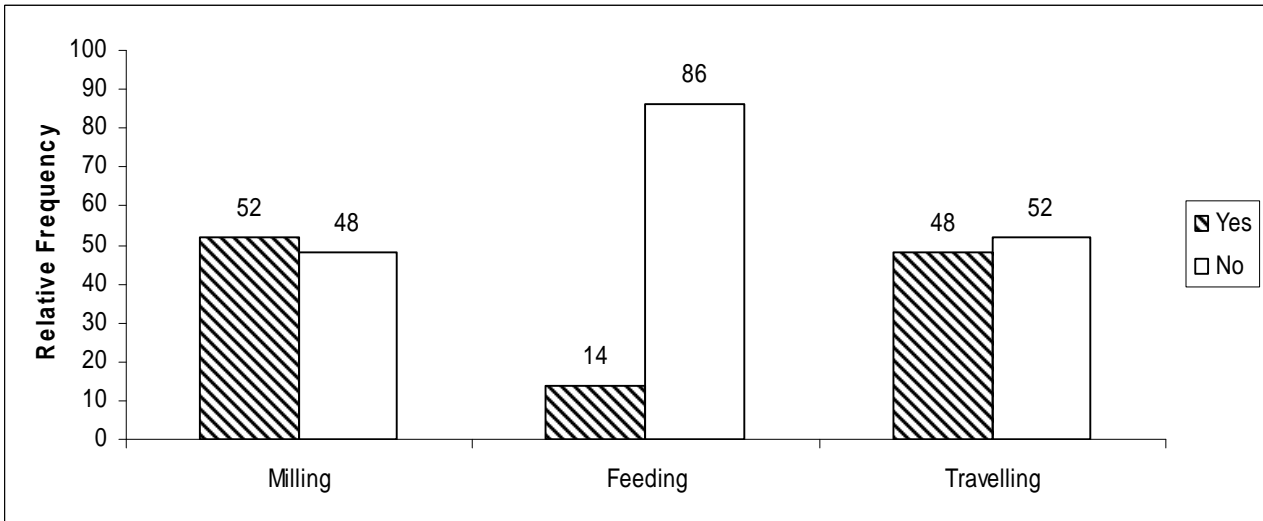


Figure 2.3m. Sei whale behaviour.

ID photos were taken of the dorsal fins (Figure 2.3n). The top photo shows that sei whales do not have the “chevron” markings that appear on fin whales. The circular scars visible on the flanks of the whale are most likely caused by cookiecutter sharks *Isistius brasiliensis*. One of the sei whales, nicknamed “Punk Rocker” due to the hole in the dorsal fin, was seen on two separate days. These photos will be analysed in detail at a later date.



Figure 2.3n. Sei whale ID photos.

## Humpback whale

Humpback whales were sighted four times. There were two individuals in one of the groups. In three out of the four sightings the individuals were travelling, while in the other encounter the whale appeared to be feeding.

ID photos were taken of the flukes (Figure 2.3o) and sent to the North Atlantic Humpback Whale Catalogue, with no matches found.

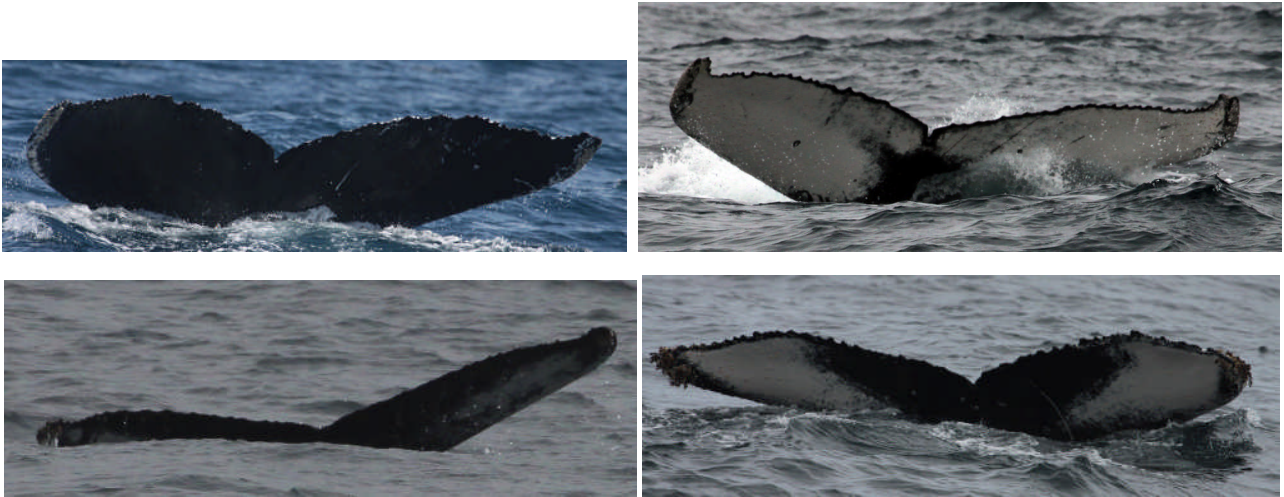


Figure 2.3o. Humpback whale ID photos.

## Sperm whale



1598



1840



Male seen during the 2012 & 2014 expeditions



Male seen in 2013 and again during the 2014 expedition

Figure 2.3p. Sperm whale ID photos.



Sperm whales are one of the main target species of the expedition. They were encountered 91 times comprising 192 animals (not all different individuals). The average group size was 2.1, ranging from 1 to 9, which is similar to that encountered during other parts of the summer. Thirteen different large males were seen and females with calves were observed 21 times. Photographs were taken of all whales that 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. Fifty-two individuals were identified in total, with six unidentifiable due to poor photo quality. Thirty-eight new animals and 13 re-sighted from previous years were seen. We had a few outstanding sperm whale days with 14 individuals identified on one day and eight on another day. This year's IDs include "1598" and "1840", first seen in 1991 and 1994 respectively and also during two expeditions in 2005 and 2007. We also observed two large males that had previously been recorded, one from the 2012 expedition and the other in 2013 (Figure 2.3p).

### Miscellaneous sightings

During the expedition loggerhead turtles were observed 13 times, five of which were captured, tagged and released (Figure 2.3q). In addition, a leatherback turtle was also sighted, but not captured.



Figure 2.3q. Loggerhead turtle ready for release.

Sightings during the expedition

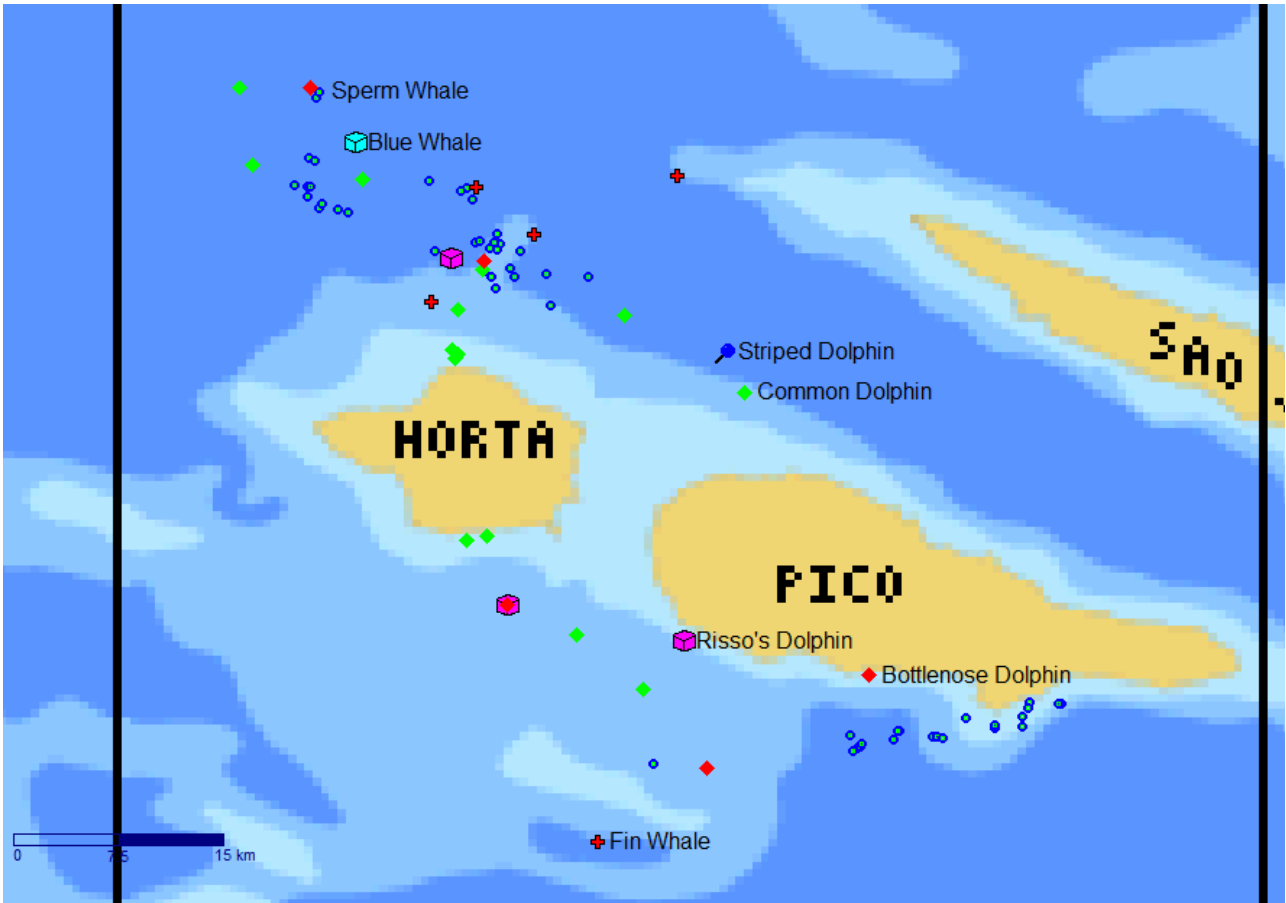


Figure 2.3r. Sightings during slot 1.

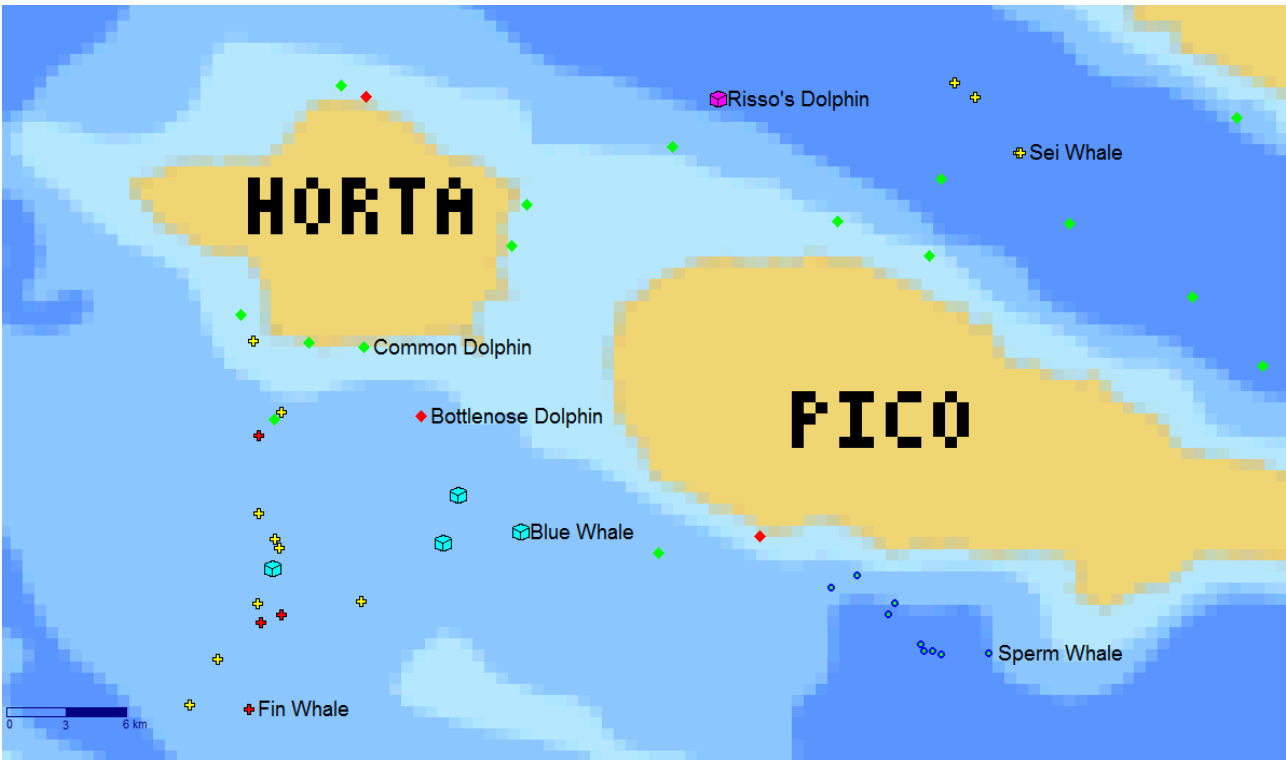


Figure 2.3s. Sightings during slot 2.

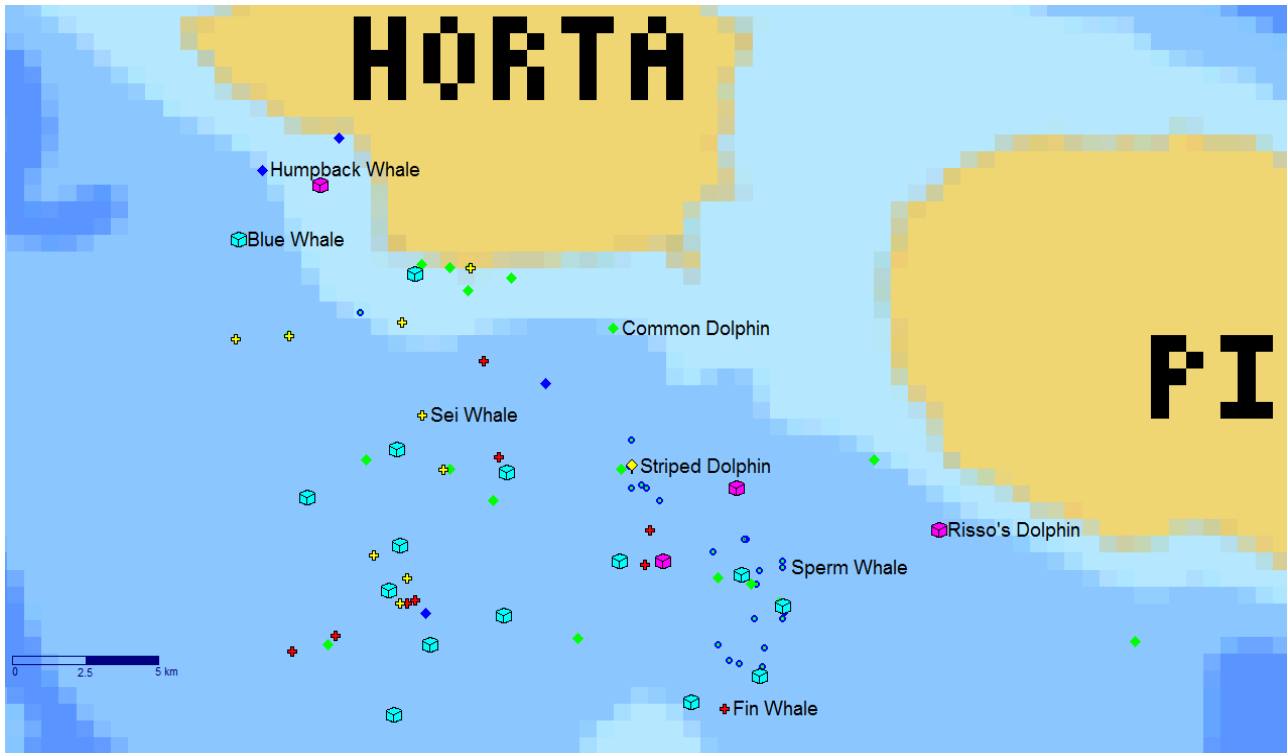


Figure 2.3t. Sightings during slot 3.

## 2.4. Discussion & conclusions

April and May are a productive time in the Azores. Biosphere Expeditions is 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. Sightings of baleen whales are unpredictable, but the use of lookouts (vigias) on the cliffs greatly enhances the chance of sighting them.

The sightings of baleen whales improved this year over last year's encounters, since the weather was also much improved. The difficult thing about planning the timing for the expedition is "predicting" when the baleen whales will be passing. This year we did well, with the number of sightings increasing through the expedition.

This year's baleen whale ID photographs were sent to the respective catalogues (apart from for sei whales). The expedition's 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. After the expedition, a blue whale was seen on the south coast of Pico that had previously been seen in the Gulf of St. Lawrence, Canada, in 1984, 30 years ago! Who knows where it has been swimming for 30 years? As mentioned above, there have only been two other blue whale long-distance matches from the Azores, one to Iceland and another one to Spitzbergen (although not our photos), and a few inter-Azores photos and our inter-year matches from 2012 to animals from 2006 and 2010. There have also been several humpback whales sighted in the Azores that have also been seen in the Cape Verde Islands, although none of the humpbacks from this year (Wenzel et al 2009). I 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. The North Atlantic Humpback Whale Catalogue (see <http://www.coa.edu/nahwc.htm>) has just reached 8,000 individuals and although the Azores photos are a very small part of this catalogue, they play an important role in discovering some long-range matches. Most researchers will not risk coming to the Azores to find baleen whales because their migration patterns are just too unpredictable, as seen by our success or lack of success in finding them. 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 dolphins were in line with previous years. We saw resident individuals of both species, although the Risso's dolphins observed were not the residents that have been seen on previous expeditions. This year we came across groups of males, as well as a couple of groups of females and calf nurseries that are not regularly sighted. The "regular" groups were sighted further down the south coast of Pico. The ID photos of the Risso's were forwarded to a biologist doing her PhD on Risso's around Pico for future analysis. The groups of bottlenose dolphin were smaller than usual. This may have been caused by lack of prey species. According to fishermen's reports, horse mackerel, one of the main prey species for many of the dolphins present in the Azores, were few and far between this year, causing smaller, more widely spread groups of dolphin.

Sperm whales were again sighted on several days, including females with suckling calves, as has been observed in previous expeditions, as well as several big males. Before Biosphere Expeditions began its research project in the area, we expected that it would be large males that would be encountered in this early part of the summer, since it was mainly males that had been caught during the winter months during the whaling years, although we do tend to see more males in the spring than the rest of the summer. Thirteen different males were observed on two different days from two "bachelor" groups during this expedition. This year, as usual, most of the males were sighted alone at the surface; seven times they were observed together in pairs. On one day, seven different males were identified and six on another. It is normal for very large males to become more solitary the older they get, but while they are "teenagers" they usually associate with other male "teenagers". In October 2009, I presented a poster on the movements of male sperm whales around the Atlantic, at the Marine Mammal Conference in Quebec (with assistance from the Friends of Biosphere Expeditions). Three males seen in the Azores were matched to animals re-sighted in Norway in 2007 and 2008. This gave us the first indication of where the males we observe may go when they are not in the Azores. The collaboration with biologists working in Norway is continuing, but none of our males from this year's expedition matched to Norway or elsewhere. This work has now been published (Steiner et al. 2012). An update on the male matching is that a fourth male, sighted by Espaco Talassa and also two other males have now been matched from Norway to the south of Pico.

Two of the males observed on 12 April 2014 had been seen in previous years, one in 2013 and the other in 2012, one alone and the other part of a pair. This may indicate that these young males move around and link up with other males when they find them. How long these bachelor groups remain together is unknown. It is thought that by the time the males are ready to breed, they are mainly solitary.

Data collected at this time of year are valuable to see if some of the same individual sperm whales remain in the archipelago for long periods of time. There is some indication that more “unknown” individuals are present in the early part of the season with the “known” animals arriving later. 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 prefer the winter. The weather in the winter is the main obstacle to investigating this theory.

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 been collaborating with two whale watching companies that operate out of Saõ Miguel as well as one of the companies from the south of Pico for the last couple of years. Several matches exist between the catalogues, indicating that there is movement of the animals around the archipelago, although most of the animals are observed in only one area. In 2011 collaboration began with SECAC a research organisation in the Canary Islands ([www.cetaceos.org](http://www.cetaceos.org)). This collaboration has already provided 13 matches between the areas. A few of these animals have been sighted in the Azores, seen in the Canary Islands and returned to the Azores. This shows that some female sperm whales undertake at least a limited migration. One of those individuals, “1019”, a whale identified in 1988, was first observed with a calf in 2010. She was photographed in the Canaries with the calf in the winter of 2010/2011 and returned to the Azores with the calf in the summer of 2011. She was again seen in the Canaries winter of 2011/2012 and in 2012 she was back in the Azores, with her calf, which was starting to make independent dives on its own. Unfortunately, as of 2013, the calf, now a juvenile, has not been seen in the group, although the mother has been seen both in 2013 and 2014. This work will hopefully be published in the near future.

Antunes (2009) completed a PhD at St Andrews University using the Azores photo-ID database of individuals from 1987 to 2007. This was used to analyse 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. He showed that there are differences between the groups of sperm whales observed here and 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 most likely due to food availability in the different areas. In addition, information on the difference in group sizes between the Atlantic (Azores/Caribbean) and the Pacific has been linked to a lack of orca predation in the Atlantic. The larger groups in the Pacific provide protection to individuals from orca attacks (Whitehead et al. 2012).

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 eleventh year. Sightings were good and encounters with baleen and sperm whales kept us occupied collecting data. More sperm whales than baleen whales were observed and there were quite a few dolphin sightings. The weather conditions during this year's expedition were reasonable; only a few days were spent out at sea in sea states of 3 or more, which makes spotting the animals, especially dolphins, difficult for observers on the boat as well as 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.

Thank you to all expedition members for your assistance.

## 2.5. Literature cited

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

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## 3.1. Introduction

The Biosphere Expeditions research project took place between 7 April and 10 May 2014 in Faial Island (Azores, Portugal). Onboard of the vessel Phyceter, 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 (14 loggerhead and 1 leatherback turtles were sighted), 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 (Azores Fisheries Observer Program).

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 the “Friend of the Sea” tuna fishery certification.

## 3.2. Results

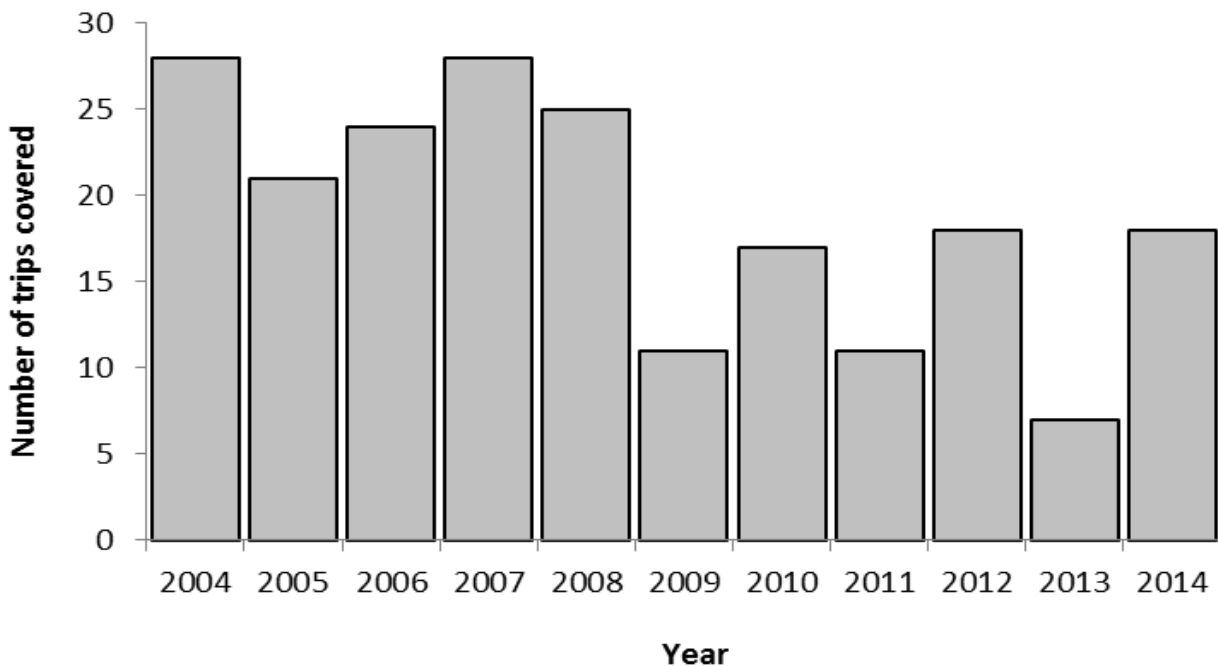


Figure 3.2a. Trip coverage during the 2004-2014 period.

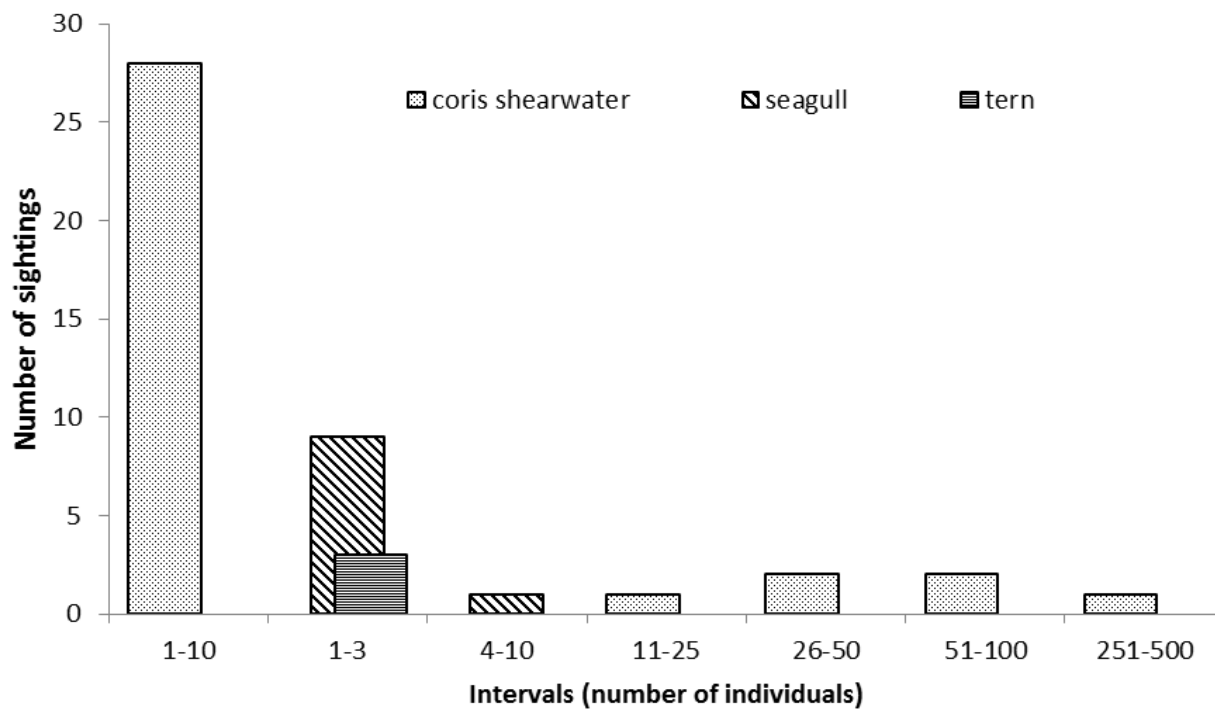


Figure 3.2b. Species of seabirds observed in 2014.

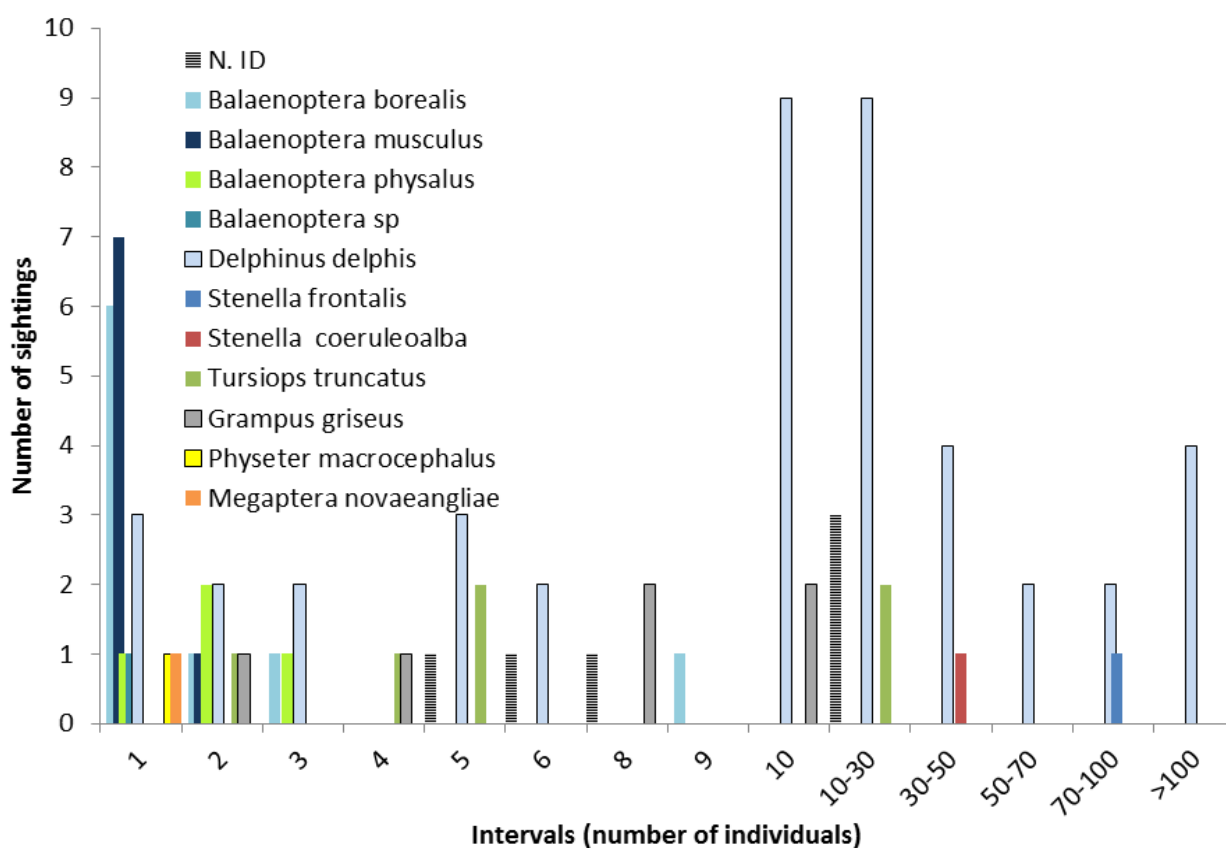


Figure 3.2c. Species of cetaceans observed in 2014.



### 3.3. Discussion

POPA has proved that accidental capture of cetaceans in the tuna fishery in the Azores is highly insignificant and no records of mortality of cetaceans were ever reported (Silva et al. 2002). But the programme has a much wider range than just the “Dolphin safe” topic. In recent years the POPA dataset (which includes data collected by Biosphere Expeditions) has been frequently requested for several research projects regarding the ecology, biology and fisheries of target and associated species. Examples are the inclusion of POPA data in the OBIS-SEAMAP and EMODnet map databases and the papers published regarding information on bottlenose dolphin distribution into marine protected area design (Silva et al. 2012) and spatial and temporal distribution of cetaceans in the mid-Atlantic waters around the Azores (Silva et al. 2013). Besides the scientific outputs, the data collected by POPA observers are also available for NGOs, government and to the fishery industry. Recently the ‘Friend of the Sea’ (FoS) Organisation revalidated the eco-certification of three tuna species in Azores based on information collected by POPA.

### 3.4. Literature cited

Silva, M.A, Prieto, R, Cascão,I., Seabra,M.I., Machete,M., Baumgartner, M.F., & Santos, R.S. 2013. Spatial and temporal distribution of cetaceans in the mid-Atlantic waters around the Azores, *Marine Biology Research*, 10(2): 123-137.

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## Appendix I: Expedition diary & reports



A multimedia expedition diary is available at <http://biosphereexpeditions.wordpress.com/category/expedition-blogs/azores-2014/>.



All expedition reports, including this and previous Azores expedition reports, are available at [www.biosphere-expeditions.org/reports](http://www.biosphere-expeditions.org/reports).