

BIOSPHERE EXPEDITIONS

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Expedition report

Surveying whales, dolphins and turtles around the Azores archipelago in the Atlantic Ocean



Expedition dates: 11 April – 21 May 2005

Report published: October 2005

Authors: Lisa Steiner & Chris Beer
Whale Watch Azores

David Moore
Biosphere Expeditions

Matthias Hammer (editor)
Biosphere Expeditions

Abstract

In 2005 Biosphere Expeditions concluded its second 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 11 April until 21 May and concentrated on six main projects. Prior to these expeditions, no cetacean studies had been conducted in April and not many hours of effort logged at sea during May. Sightings of all cetacean species were recorded. A total of nine different species of cetacean and one species of turtle were encountered over the expedition period. Photo-identification, which has been ongoing for sperm whales, bottlenose and Risso's dolphin since 1987 and baleen whales since 1997, continued.

Sperm whale photo-ID. Sperm whale photo-identification that has been ongoing since 1987 in the Azores continued. 68 identifiable were individuals photographed, including 4 animals seen in previous years.

Baleen whales photo-ID. Baleen whales have been seen with increased frequency over the last few years. The expedition encountered 5 species (blue, fin, sei, humpback whale and an unidentified species) and photographed them with the aim of comparing photographs taken around the Atlantic over the next several months and years to see if any animals have been sighted in any other regions, thus gaining an insight into the movements of these large whales.

Dolphin photo-ID. Dolphin photo-identification, which has been ongoing for bottlenose and Risso's dolphin since 1987, continued. 24 groups of bottlenose dolphin and 9 groups of Risso's dolphin were photographed. Most of these photographs will be analysed at a later date, but some of the Risso's and bottlenose photos were sorted during the expedition on shore days, showing some re-sighted groups of both resident bottlenose and Risso's dolphins.

Europhlukes is a European wide project that has brought together different researchers from several countries to share data and photo-identification pictures of various species. Extraction of sperm whale fluke contours taken during the expedition, as well as pilot whale, bottlenose and Risso's dolphin dorsal fins were performed for the Azores and Canaries (pilot whales) catalogues. Once the backlog of dorsal images have been extracted, the photographs that are taken on a particular day can be analysed. They are matched to the catalogue of individuals that have been previously seen around the Azores and North Atlantic to obtain information on movements around the islands for the dolphin and hopefully around the ocean for the whales. Several useful suggestions on the dorsal fin program have been forwarded to the programmers with the aim of improving the accuracy of extractions.

POPA. Data collection for the Department of Oceanography and Fisheries (DOP) of the University of the Azores, for the Tuna Boat Observer programme, POPA, was successfully collected for a second year. Phyceter 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 2 loggerhead turtles were caught, measured and tagged and 2 others were sighted but not captured. No other species of turtle was observed.

Resumo

Em 2005, a “Biosphere Expeditions” concluiu com sucesso o seu segundo ano de foto identificação de cetáceos e estudos de distribuição nos Açores. A expedição ficou sediada na Horta, ilha do Faial e o trabalho de campo foi efectuado em três ilhas: Faial, Pico e São Jorge. A expedição decorreu no período compreendido entre 11 de Abril e 21 de Maio de 2005 e esteve envolvida em 6 projectos descritos mais à frente. Antes desta expedição, nunca tinham sido feitas amostragens do género no mês de Abril e poucas tinham ocorrido em Maio. Todos os avistamentos de cetáceos foram registados. Foram observadas 9 espécies diferentes de cetáceos e 1 de tartarugas. Deu-se seguimento à foto identificação de cachalotes, roazes e grampos, que já ocorre desde 1987 e de outras baleias, que ocorre desde 1997.

Foto identificação de cachalotes. A foto identificação de cachalotes, que decorre já desde 1987, prosseguiu com 68 registos efectuados com sucesso, onde se incluíram 4 animais que já tinham sido fotografados anteriormente.

Foto identificação de baleias. Nos últimos anos, algumas baleias de barbas têm sido avistadas cada vez com mais frequência. A expedição encontrou e fotografou 5 espécies (baleia azul, baleia comum, baleia sardineira, baleia de bossas e outras não identificadas) com o objectivo de comparar registos com outros recolhidos por todo o Atlântico nos últimos meses e anos de forma a complementar os conhecimentos sobre os seus padrões de movimento e verificar se os animais já tinham sido avistados noutros locais.

Foto identificação de pequenos delfínidos. A foto identificação de golfinhos, que tem vindo a ser efectuada nos Açores desde 1987, nomeadamente para roazes e grampos, prosseguiu. Foram fotografados 24 grupos de roazes e 9 de grampos. As fotografias em causa serão analisadas posteriormente mas sublinha-se que algumas análises preliminares revelaram avistamentos de animais já conhecidos, pertencentes a grupos residentes de roazes e grampos.

Europhlukes. Este projecto europeu reuniu vários investigadores de diferentes países com o objectivo de partilhar dados, nomeadamente fotografias de foto-identificação de diferentes espécies. O programa automático de extracção de contornos de barbatanas caudais foi novamente utilizado durante a expedição visando cachalotes, baleias piloto, roazes e grampos. Estes dados foram incluídos nos catálogos dos Açores e Canárias (baleias piloto). Com base no catálogo de contornos, as fotografias tiradas num qualquer dia podem ser analisadas e eventualmente serem encontrados indivíduos que já foram previamente avistados nos Açores ou no Atlântico Norte. Esta ferramenta é bastante útil na definição de rotas dos golfinhos à volta das ilhas e de migrações das baleias no oceano. Foram efectuadas várias sugestões aos responsáveis do Programa no sentido de haver um melhoramento no grau de exactidão das recolhas.

POPA. Pelo segundo ano consecutivo foram recolhidos dados para o Programa de Observação para as Pescas dos Açores (POPA) do Departamento de Oceanografia e Pescas da Universidade dos Açores. A embarcação “Physeter” é a única plataforma não comercial que contribui para este fim. A recolha de informação incluiu registos de avistamentos de cetáceos e tartarugas marinhas em transectos definidos pela embarcação/membro da expedição, censos visuais de aves marinhas e registo de parâmetros ambientais.

Tartarugas. A recolha e marcação de tartarugas bobas nos Açores decorre desde 1988, numa iniciativa conjunta entre a Universidade da Florida e a Universidade dos Açores. Durante esta expedição, foram capturadas, medidas e marcadas 2 tartarugas e avistaram-se mais duas que não chegaram a ser capturadas. No decorrer da expedição não foram avistadas outras espécies de tartaruga.

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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 11 April to 21 May 2005. 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.

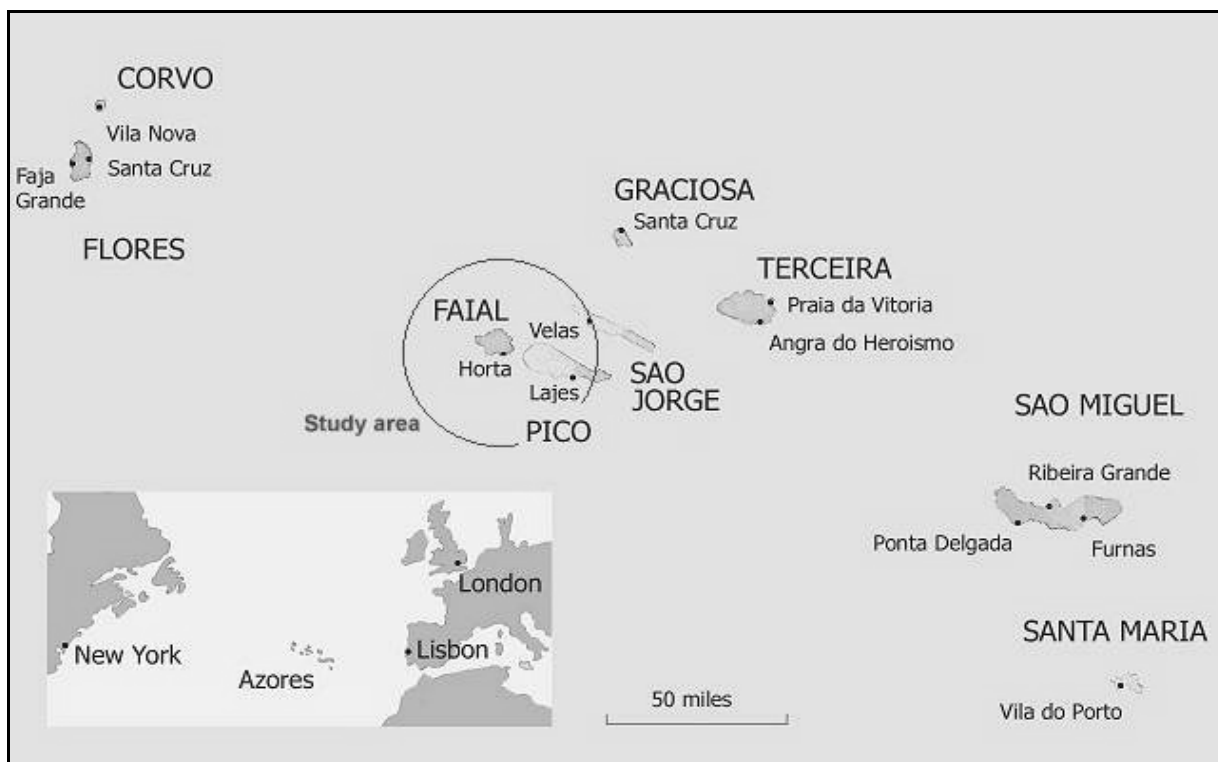
The Azores archipelago, which sits near the middle of the Atlantic Ocean, about 1400 kilometres off the coast of Portugal, is one of the prime whale and dolphin hotspots in the world and around 30% of the world's known cetacean species have been recorded there. For management purposes the International 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 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 1600 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

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 two-week slots, each composed of a team of international research assistants, scientists and an expedition leader. Slot dates were:

11 - 23 April | 25 April - 7 May | 9 - 21 May 2005

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 in modern, small self-catering accommodation in the centre of the town of Horta, about 800 metres from the marina. Three to four team members shared a small apartment with two double or twin rooms, a kitchenette and sitting room, shower and toilet. Many of the meals were self-catering though local restaurants were used for some meals. Vegetarians were catered for.

Field communications

The boat carried two radios for communication with other boats. There were telephones at base and 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 liferafts, 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 sea-sickness.

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 Miami University 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, Lisa's husband, is a marine engineer and qualified yachtmaster. 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, around India, Tibet and the Middle East. He has also published research papers together with Lisa and is currently writing a book on the cetaceans of the Azores.

1.6. Expedition Leader

David Moore was born and educated in England and now lives in the UK and France. He graduated in French and German and studied Japanese while working for two years in Tokyo. His expedition/group leading experience began with Japanese educational trips in Australia and he has since worked in the Caribbean and throughout Europe for companies such as P&O, Explorica and Alyson Adventures. David joined Biosphere Expeditions in 2003.

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:

11 – 23 April 2005

Delwyn Blay (New Zealand), Will Dennis (UK), Jo Griffith (UK), Julia Hambrock (Germany), Bénédicte Lallemand (France), Cathy MacLean (Canada), Johnathan Morrison (UK), Colette Plumbridge (UK), Oliver Segnitz (Germany), Sue Trask (UK).

25 April – 7 May 2005

Collin Campbell (UK), Markus Gloger (Germany), Mel Horton (UK), Rob Huxtable (UK), Jane Keep (UK), Torsten Kopetz (Germany), Alice Lakeman (UK), Colette Plumbridge (UK), Karen Smith (UK), Rachel Stephenson (UK), Deborah True (UK).

9 – 21 May 2005

Gesine Berndt (Switzerland), Jaspal Birdi (UK), Jacqui Boomsma (UK), Natalie Bush (UK), Carol Davies (USA), Sara Denton (UK), Jennifer Felton (UK), Magdalene Melchers (Germany), Jacqueline Romkes (the Netherlands), Nicola Stait (UK), Anne Winners (Germany), Ellen Wood (UK).

Also: scientific assistant slot 1: Deborah True (UK), scientific assistant slots 2 & 3: Marijke De Boer (the Netherlands), and POPA coordinator Miguel Machete (Portugal).

1.8. Expedition Budget

Each team member paid towards expedition costs a contribution of £1200 per person per two week 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	38,211
 Expenditure	
Base camp and food includes all board & lodging, base camp equipment	10,080
Transport Includes boat fuel & oils, taxis	2,796
Equipment and hardware includes research materials & gear etc purchased in UK & Azores	740
Biosphere Expeditions staff includes salaries, travel and expenses to Azores	2,058
Local staff includes whale lookout and other locally staffed services	857
Administration includes registration fees, sundries etc	457
Scientific services & logistics organisation Payment to Whale Watch Azores including boat wear & tear allowance	5,250
Team recruitment Azores as estimated % of PR costs for Biosphere Expeditions	4,400
 Income – Expenditure	 11,573
 Total percentage spent directly on project	 70%

1.9. 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 and donors, Land Rover, Cotswold Outdoor, Globetrotter Ausrüstung and Gerald Arnhold for their sponsorship.

1.10. 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.

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 km off the coast of Portugal (see above for a map and description of the archipelago).

24 species of cetacean have been seen in the islands over the last 15 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 scientific work had previously been conducted around the archipelago before June, which is why the expedition took place in April and May.

Incidental sightings of baleen whales, by lookouts and fishermen, have been recorded fairly regularly migrating past the islands in May and June, but it is unknown where they come from or where they are migrating to. It is thought that they are travelling north to feed in the waters around Iceland for the summer. Photo-identification of the animals passing the Azores will enable us to match photos with any taken in Iceland or elsewhere for comparison through Europhlukes.

Although sperm whales were once 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 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 females and calves are in the archipelago all year round.

Photo-identification of sperm whales has been going on in the Azores since 1987 and roughly 1500 individuals have been identified since then. The Europhlukes matching program makes matching individuals much faster than it was possible before, when matches were found manually.

It is thought that some bottlenose and Risso's dolphin are resident in 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.

2.2. Methods

Physeter (Latin for sperm whale), a 12m motor catamaran, was used to go to sea on days when weather conditions permitted. Local lookouts called 'vigias' were located on the cliffs about 150 m above sea level. They began to look for whales at around 7:30 to be able to direct the boat on departure at 09:00. The boat also had four additional lookouts onboard, three on the bow and one in the stern searching for cetaceans. Two expedition team members were dedicated to filling in POPA forms (transects and bird and turtle surveys). Other team members were on camera duty, data sheets or the boat log.

Once an animal was sighted, sperm whales and humpbacks were approached from behind in order to obtain fluke photographs. Blue, fin and sei whales were also approached from behind but subsequently the boat moved further forward to obtain photographs of the chevrons (white markings below and behind the blow hole) and the dorsal fins. Bottlenose and Risso's dolphin were also paralleled in order to obtain dorsal fin photographs for identification of individuals. Other dolphins sighted were approached for species identification and then the boat usually moved on to look for other animals. The boat usually remained at sea from 09:00 until 16:00 or 17:00. When cetaceans were sighted, the boat moved closer for species identification and photo-identification. The start and end time of the encounter, the position of the sighting as well as number of animals, presence or absence of calves and general behaviour (milling, feeding, bowriding or travelling) were recorded. 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. When loggerhead turtles were sighted, their position was recorded on the POPA forms. If the animal was caught, capture position was recorded and it was measured and tagged for the University of Florida/University of the Azores turtle tagging programme.

2.3. Results

Effort

Physeter normally left the harbour around 09:00 and returned between 16:00 and 17:00, weather permitting. The boat went to sea for 23 days during the expedition and spent between 1.25 and 8.75 hours per day on the water, with an average of 5.75 hours, and monthly totals of 58.75 hours in April and 73.5 hours in May in sea conditions below Beaufort scale sea state 5.

Sightings

During the six-week expedition 227 different groups of whales and dolphins were encountered (compared to 267 different groups on an eight-week expedition in 2004).

Table 2.3a. Species encountered during the 2004 (eight weeks) and 2005 (six weeks) expeditions.

Species	Encounters	
	2004	2005
COMMON, <i>Delphinus delphis</i>	65	60
BOTTLENOSE, <i>Tursiops truncatus</i>	22	24
RISSO'S, <i>Grampus griseus</i>	14	9
STRIPED, <i>Stenella coeruleoalba</i>	9	2
PILOT, <i>Globicephala macrorhynchus</i>	1	0
BLUE, <i>Balaenoptera musculus</i>	5	2
FIN, <i>Balaenoptera physalus</i>	16	1
SEI, <i>Balaenoptera borealis</i>	7	2
MINKE, <i>Balaenoptera acurostrata</i>	2	0
HUMPBACK, <i>Megaptera novangliae</i>	5	2
BEAKED, <i>Mesoplodon sp.</i>	2	0
PYGMY SPERM, <i>Kogia breviceps</i>	1	0
UNKNOWN BALEEN, <i>Balaenoptera sp.</i>	1	1
SPERM, <i>Physeter macrocephalus</i>	117	124

These encounters resulted in a relative sightings frequency as shown below. Sperm whales were the species encountered most often, followed by common dolphin and bottlenose dolphin, these three accounting for 91.6% of all sightings.

Relative frequency

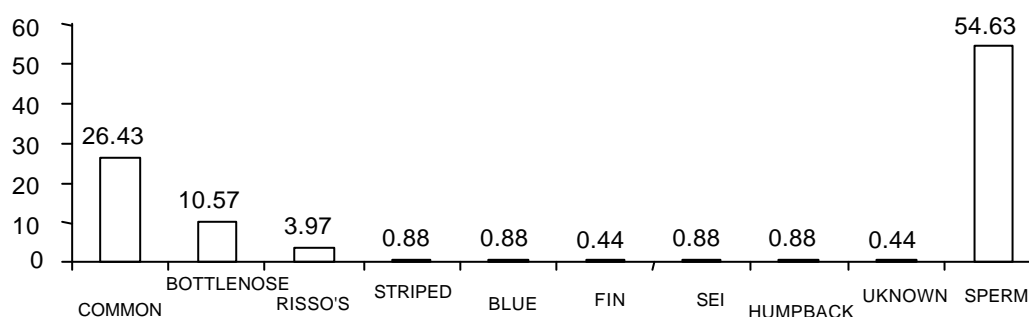


Figure 2.3a. Percentage frequency of encounters by species during the expedition.

Common dolphin

This species was encountered 60 times. The group size ranged from 1 - 100 and the average group size was 19.8. This group size is lower than the average group size of 108 for existing data from June - September and about half of that observed in the 2004 expedition. Almost 50% of encounters were of group sizes fewer than 10. Calves were seen from 13 April and observed only 8 times in April and on 13 further occasions in May, indicating that the middle to end of April or the beginning of May is the start of the main calving period. Several calves were observed with the foetal folds visible on their flanks, a sign that the animal is no more than a month old. Group size with calves present was significantly larger than when no calves were present, 28.19 as opposed to 15.33.

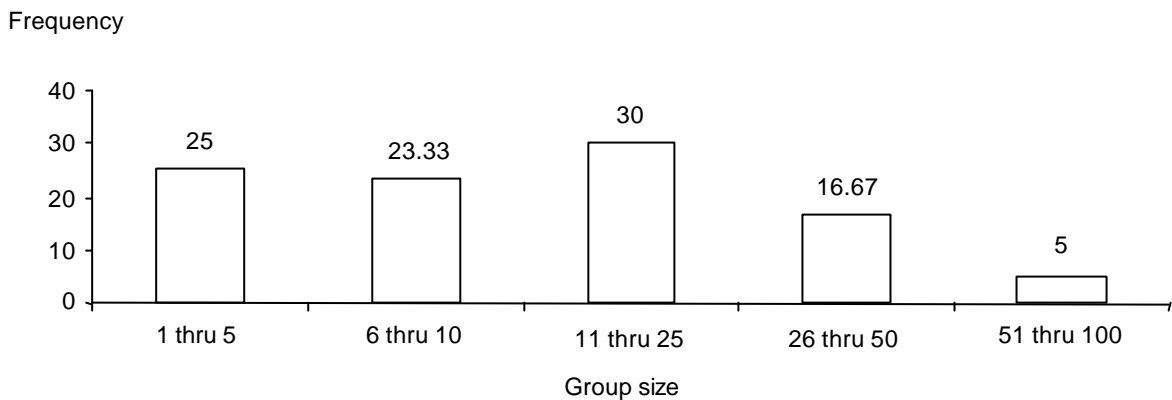


Figure 2.3b. Common dolphin group size.

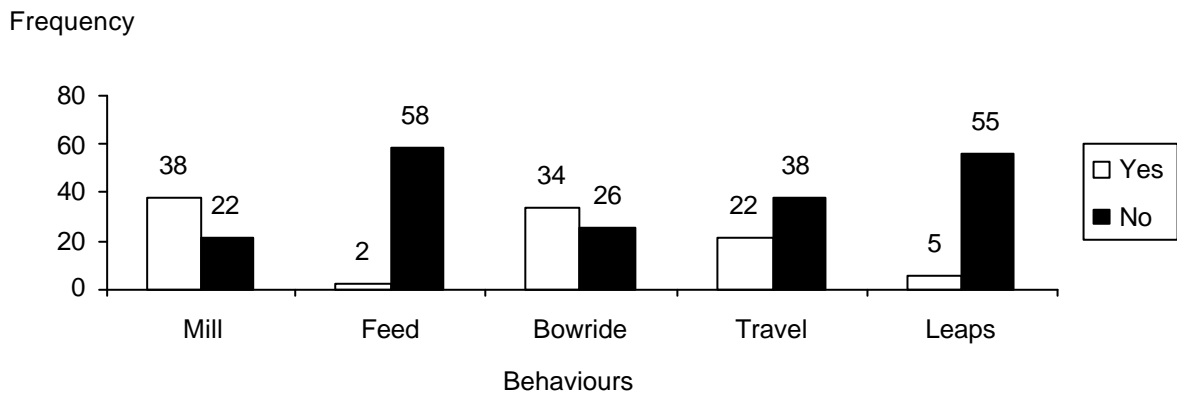


Figure 2.3c. Common dolphin behavioural patterns.

Bottlenose dolphin

This species was observed 24 times. The group size ranged from 1 - 50 and average group size was 25, which is comparable to the average of 27.3 seen when considering previously collected data (although this is about half the group size observed during the 2004 expedition). Transient groups of dolphin that passed by during the early part of 2004 year may have caused this difference. Calves were seen on 50% of sightings from both April and May. Group size was significantly larger when calves were present and there was no significant difference in group size between April and May.

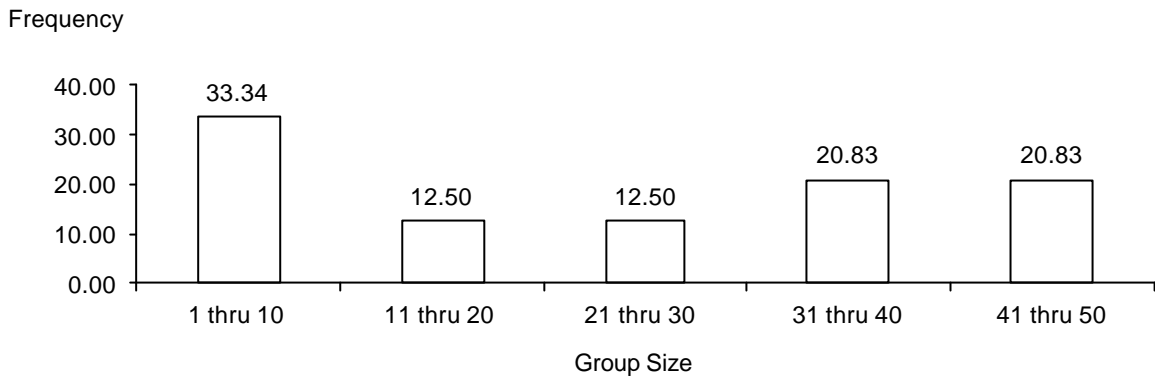


Figure 2.3d. Bottlenose dolphin group size.

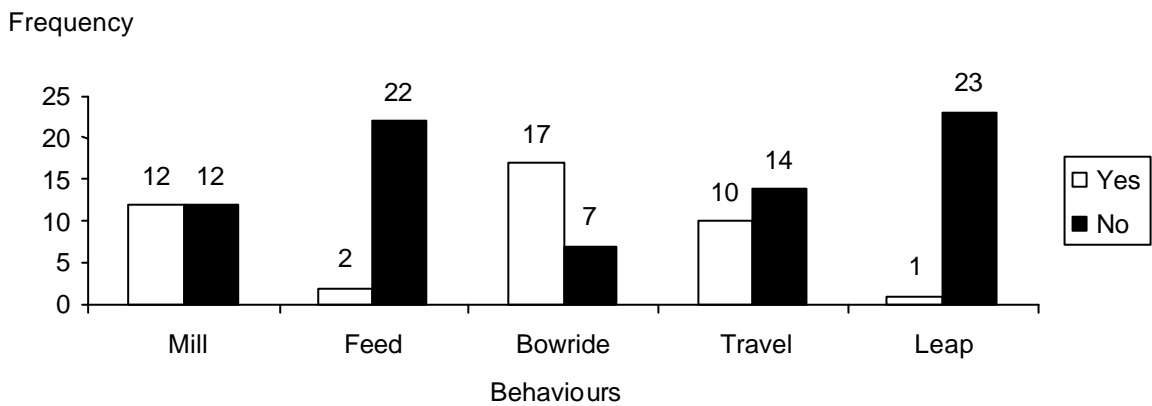


Figure 2.3e. Bottlenose dolphin behavioural patterns .

Risso's dolphin

Risso's dolphin were observed 9 times, group size ranged from 2 - 30 with an average of 14.1, which is similar to the average group size of 15 observed for other months of the summer. Calves were seen consistently through April and May signifying an earlier calving period than for bottlenose and common dolphin. There was no significant difference between group size when calves were present or not, however, there was a significant difference between April and May, with April group sizes less than half that observed in May. This difference is most likely due to the fact that Risso's were only observed 3 times in May, which may have skewed the data towards a larger group size.

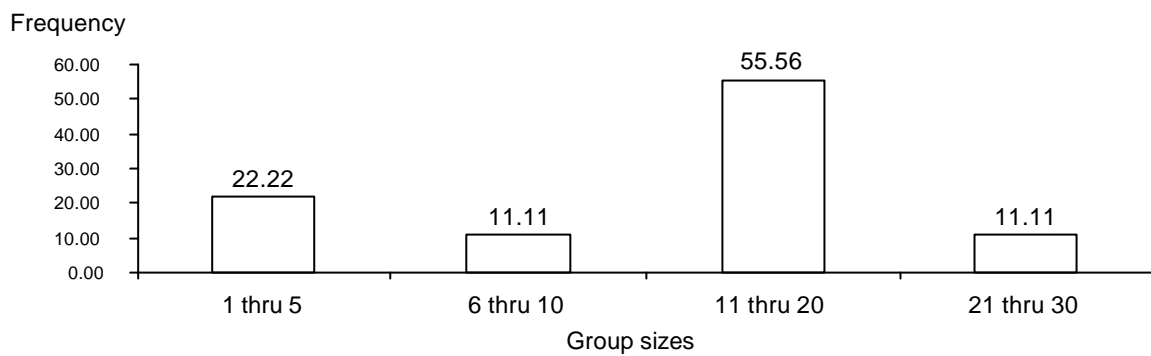


Figure 2.3f. Risso's dolphin group size.

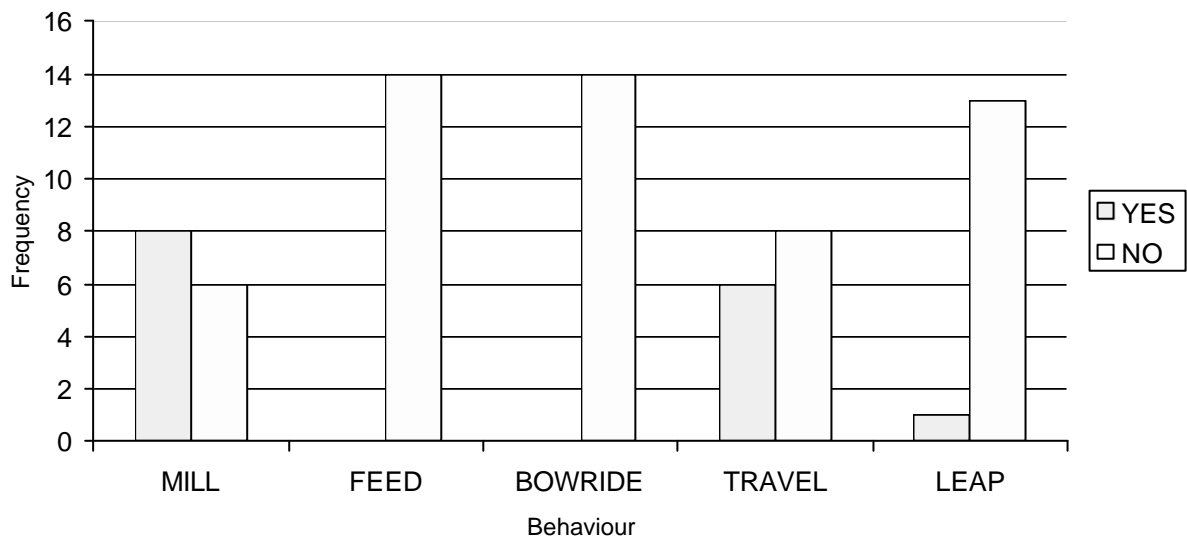


Figure 2.3g. Risso's dolphin behavioural patterns .



Christmas Tree



Naked Lady



Pi Sweep



Saturn



Spaghetti



K Dot

Striped dolphin

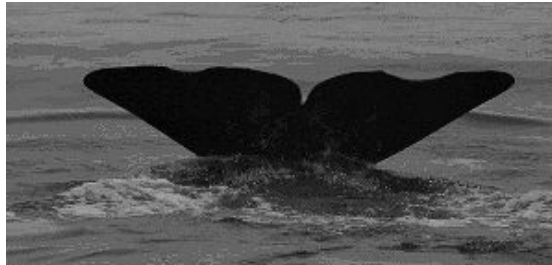
Striped dolphins were only observed twice, once in April and once in May. Group sizes of 60 and 75 are about half the average of 118 that was subsequently seen over the rest of the summer, but with only 2 sightings nothing can be concluded. Calves were seen on both occasions. The dolphins were seen travelling in April and milling during the May encounter. Again, with only 2 sightings nothing conclusive can be determined.

Sperm whale

Sperm whales are one of the main target species of the expedition. They were encountered 124 times. The average group size was 1.94, ranging from 1 - 15, which is similar to that encountered during other parts of the summer. Calves were observed 36 times, 6 times in April and 30 times in May. 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. 68 individuals were identified, including 4 animals seen in previous years. Seeing animals that have been seen in previous years this early in the season is a promising development. It shows that some of the sperm whales returning to the area do not have a seasonal preference and can be seen in all months, or are possibly moving around the archipelago all year round.



Unnamed sperm whale first seen in 1995.



Unnamed sperm whale first seen in 1995.



Unnamed sperm whale first seen in 2004.

As a result of the expedition team's extraction work on the computers, another important recommendation has been forwarded to Europhlukes from the data collected during the expedition. Last year we asked that any white markings on the flukes be listed in one way or another in the extraction program to enhance matching capability, as the white markings remain constant over the years. This year we have observed a hole in the edge of a fluke remaining constant, while the trailing edge did not. As can be seen below Curious George in 2004 did not have the scallops on the left side of the fluke, which are now present.



"Curious George" as seen in 2004.



"Curious George" as seen in 2005.

Attempts at sperm whale skin collection were unsuccessful. Further attempts will be made next year.

Fin whale

Fin whales were only observed once by the 2005 expedition. A single animal was seen south of Pico on 15 April. It appears that the baleen whales either stayed further offshore this year or were later in passing the islands than last year. The individual observed was milling and presumably feeding although no prey was seen. A good ID picture of the dorsal was taken and added to the Europhlukes database.



Fin whale ID picture.

Sei whale

Sei whales were sighted twice. One sighting was a group of 3 and the other 2 individuals, which are similar to the 2.51 average group size seen previously. Calves were not seen. On both occasions the whales were travelling west.

Blue whale

Blue whales were seen twice in April. A single animal was observed feeding on 14 April showing the tail fluke, and on 26 April a group of 3 were travelling. No calves were observed. Blue whales have generally been seen more often in June than May, so the timing of their migration may be slightly later than the other baleen whales.



Blue whale fluke.

Humpback whale

Two individual humpback whales were observed. One individual was observed on 3 May and the other on 6 May. Both whales were feeding, although neither whale lifted its tail fluke for identification. The first whale did lobtail, however, and this may prove useful for identifying the individual. Prior to 2004, only a single humpback had been seen in the Azores in 1996. Humpback whales found in the eastern part of the Atlantic are thought to breed around the Cape Verde Islands and feed in Icelandic waters, but this has yet to be shown with a photographic match between areas. The photos below may play a crucial part in finding such a match in future.



3 May.



6 May.

2.4. Discussion and conclusions

April and May are a productive time in the Azores and Biosphere Expeditions are playing a crucial role in collecting important scientific data at a time of year when little or no work has been done in the past. Many species of cetacean can be observed. In fact, the potential variety of cetaceans is greater at this time of year than the rest of the summer. Although sightings of baleen whales are unpredictable, the use of lookouts on the cliffs greatly enhances the chances of sighting them. Photo-identification of the baleen whales passing the Azores will provide much needed information regarding blue, fin, sei and humpback whales in the eastern Atlantic, leading to a fuller understanding of their movement and association patterns.

Anecdotal information from land-based lookouts and fishermen gives vague hints as to large whales other than sperm whales being seen, but no scientific data exists to verify these sightings. Biosphere Expeditions are the first research organisation to mount a long term study in the Azores into these species at this time of year. In the first two years of Biosphere Expedition's Azores expeditions alone, we had 42 sightings of baleen whales, showing there is great promise for further studies. Future expeditions will again record all sightings and in particular photo identification pictures of all baleen whale dorsal fins, and tails where shown. In several years we may start to see re-sighted animals or they may be seen elsewhere in the North Atlantic by members of Europhlukes and therefore start to show a pattern of annual migrations.

Baseline data collected on blow rates/dive times will provide a useful database for comparison in any future disturbance studies. Disturbance studies look at how an animal is affected by changes to its environment. Blow rate/dive time studies are useful as they provide a "behaviour based" data set, which can be used in comparative studies. Comparisons can be made between data sets obtained before and after an historical event (such as an increase in large scale fisheries operations), between data sets obtained from a boat and a cliff top watcher (when no boats are around) and between data sets obtained for whales near boats operating within whale watch regulations and boats in breach of whale watch regulations. Changes (or lack of) in behaviour of the animals can be monitored for the above only if two sets of data are available. These comparative behaviour studies can be an effective tool when used to lobby government for better protection of the whales and dolphins. Biosphere Expedition's team members have so far added around 25 blow rate and dive time sequences, to a small but growing database for the Azores. Collections will continue in future years, as the larger the dataset, the more useful it will be.

Group sizes observed here support what is generally known, namely that large baleen whales are usually seen singly or in small groups. This year's expedition did not have as many encounters with baleen whales as the 2004 expedition. It may be that there was not the abundance of krill, which was found last year, keeping many of them offshore. More likely, it may be that the migration in 2005 occurred later than in 2004, as more baleen whales were observed later in the year, after the expedition.

In future, expeditions will again count group sizes and numbers of encounters and compare the findings with previous years and any change will be noted. This is a long term study that requires many years of data collection, but with sufficient time and resources, it will be possible to compare results between years and get a more accurate idea of the numbers of baleen whales passing the islands.

Sperm whales were again sighted in larger than expected numbers, including females with suckling calves, which were also observed in 2004. Several social groups of females, calves and juveniles, of up to 16 whales were recorded. Before the 2004 expedition, we expected that it would be mainly large males that were encountered at this early part of the summer, but this has proved not to be the case during both expeditions (although males were observed 20 times this year; not all different individuals).

Knowledge of sperm whale occurrence in the Azores during the expedition timeframe was gained from whaling records, showing male catches to be high up to July, whereas female catches did not become high until July (Report of the International Whaling Commission 35, 1985). This view may be caused by whalers ignoring females when the males are abundant in the area, but could also be due to weather and the difficulty in seeing the smaller females in rough, spring sea conditions. Only a long term study can assess the implications of seeing more females at this time. However, it may be that more females coming to the area earlier means that the female sperm whale population is spreading its visits to the Azores to avoid competition for food and mating opportunities with the males. Another possibility is that the females have started to look favourably on the Azores as a place of little disturbance, where they feel safe to give birth and raise their young, now that the whaling has ceased. No scientific data currently supports these theories, but further studies may one day prove or disprove these ideas.

Data collected at this time of year are valuable in elucidating whether some of the same individuals remain in the archipelago for long periods of time. One individual observed during the 2004 expedition, number 19, has now been seen in all months, May through October, since 1987. Curious George was observed for several weeks during 2004 and 2005. These data are valuable because sperm whale pods staying long periods in the area may be disturbed by fishing, research, seismic, or whale watching activities. Taking whale watching as an example, if it can be shown that whales stay despite repeated visits from whale watch boats, then this could show that the whales are not excessively disturbed by current whale watching practises. Governmental decisions on the numbers of whale watch boats licensed to operate, or the areas they are allowed to operate, can then be safely made with this knowledge in hand.

Sightings in April and May of bottlenose and Risso's dolphin lend support to the idea that some groups of these two species are resident around the archipelago and therefore are present year round. Some of the photographs have already been analysed and they confirm that a few of the groups seen are the same as those seen last year, as well as some of the same individuals being observed in April and May during the expedition.

Knowing whether a group of animals is resident in the area year round can be used by scientists studying the effects of various marine events, such as underwater volcanic eruptions, dredging and fisheries activities, large vessel passages through the islands or whale and dolphin watching activities. Resident groups can be affected by these activities far more than transient groups, so having an idea of the number and size of resident groups, their home ranges and feeding areas, can be very useful for carrying out the environmental assessments that are now commonplace requirements for many marine based activities. Having the baseline data from the Azores to compare with other archipelagos, can also be a useful comparative tool, especially if a particular proposed activity has already been carried out in a similar archipelago. There are resident groups of bottlenose dolphin and pilot whales in the Canary Islands that are subject to heavy whale watching pressure and are currently being studied to discover if they are suffering any adverse effects of this pressure. So far the animals have not changed their preferred habitat and are still found in the same areas.

Risso's dolphin photo-ID pictures have again been sent to the Risso's Project, on the south coast of Pico, for comparison with their catalogue of resident animals, seen throughout the summer over the past four years. The sightings earlier in the year also provide insights into calving times for bottlenose, common and Risso's dolphin that are seen in all months of the summer.

We provide data to the Risso's Project because they have the largest database of Risso's dolphin in the Azores and they are the only organisation specialising in the study of this species in the archipelago. They also have a reciprocal agreement to provide sperm whale photo identification pictures to us, to help with our ongoing studies. They are well placed to analyse the data and sightings we collect for them and our help gives them a chance to see which animals are seen in geographical areas that are not accessible to them (they only have a small boat, not capable of travelling long distances from their base). They are trying to build up information on this little known species to determine more about their lives from birth to death, feeding habits, calving times, social structures, etc. They are also currently assessing the effects of whale watching in the small area they operate in and especially the "swim with dolphin" programme. Knowing more about the social behaviour of Risso's and their calving times will enable them to make recommendations to government on the safety of the swim with dolphin programme and how it should be controlled, to minimise disturbance to the animals.

In conclusion, this expedition was a success for the second year running. Sightings went beyond expectations despite the variable weather conditions. Re-sighting individual sperm whales from previous years shows the value of the Europhlukes programme, because the programme looks at each photo and can then give the human operator a much smaller number of possible matches to previous years. This drastically cuts down the time needed to assess whether a whale seen that day, was seen previously. Before the programme was used a wait of 5 or 6 months was necessary before film was processed, analysed, printed and then matched by eye to a catalogue of 1000+ previously taken pictures.

Re-sightings of Risso's and bottlenose dolphin are also a positive outcome from the 2005 expedition, as they support the theory of resident groups, which will be important when assessing whale watch boat activities and swim with dolphin programmes in particular.

In future years, matching of the baleen whales seen this year to new photographs will help to elucidate whether it is the same individuals that are passing the islands each year or many different animals. Knowing whether the same animals are passing the islands will help researchers working on whale stock assessments in the North Atlantic accurately to estimate numbers and, as part of a bigger study of baleen whale numbers, make recommendations to the IWC on keeping or relaxing the whaling moratorium. Further expeditions will continue to build on these data for April and May to make the assessments more accurate. This is a long term study with many years worth of data to collect and analyse. Biosphere Expedition's team members have now made a significant contribution to this project, the only one of its kind in the Azores.

Thank you to all expedition members for your assistance.

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

2.1. Introduction

The Biosphere Expeditions research project took place between 11 April and 21 May 2005 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 loggerhead, baleen and toothed whales, dolphins and several species of seabirds (see tables 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).

2.2. Results

Table 2.2a. Species of marine birds spotted.

Species	Number of individuals
<i>Calonectris diomedea borealis</i> Cory's shearwater	1152-1530
<i>Sterna hirundo</i> Common tern	1-3
<i>Larus cachinnans atlantis</i> Common gull	18-50

Table 2.2b. Species of whales and dolphins observed.

Baleens	Number of individuals	Dolphins	Number of individuals
<i>Balaenoptera borealis</i> Sei whale	4	<i>Delphinus delphis</i> Common dolphin	744-1268
		<i>Stenella coeruleoalba</i> Striped dolphin	10-30
		<i>Tursiops truncatus</i> Bottlenose dolphin	255-455
		<i>Grampus griseus</i> Risso's dolphin	100-210

4. Expedition leaders' diary: Azores 2005 by David Moore

Thursday 7th March

Here's the first diary entry from David, your expedition leader, for the 2005 Azores Whale and Dolphin surveying expedition.

I'm here at Biosphere headquarters in Suffolk, getting together some of the equipment and sorting out some of the final details before leaving for Faial early on Saturday.

We've just spoken to Chris, chief skipper, on the phone – he tells us the weather forecast is good and the boat is ready for us all!

For the first slot, I'm looking forward to meeting you all off Monday's plane from Lisbon (if not, in Pete's café at 13:30). For all of you joining us in the later slots, I'll keep you updated of our progress in this diary...

Wednesday 13th March

After the arrival of the first slot of team members on Monday, we managed to fit in most of the training on Monday to profit from the predicted good weather today and yesterday.

Tuesday got off to a good start with a number of sightings of common dolphin and a Risso's dolphin encounter as we sailed down the coast of Faial to follow up on some cetacean sightings given to us by the lookouts towards the northern end of the island. They proved right and after a bit of searching in what were quite choppy seas we encountered some Sei whales who we were able to track by following their 'footprints'.

We've just come back now from a full day at sea today, having sailed right down to the far end of Pico to spend a couple of hours with a group of sperm whales travelling about a mile and a half off the coast where they follow the 500-1000m contour line to feed on the squid there. Though travelling away from us, the sightings from the lookouts and soundings from the hydrophone meant we were able to catch up with them and in fact totalled 12 encounters.

This meant quite a bit of manoeuvring for Chris in order to position the boat behind the diving animals in order to not disturb them and to be in a good position for the whale fluke ID photos. We're just about to download the pictures and see which are best for inclusion on the database. Along with these we had a few sighting of the shy striped dolphins jumping out of the water ahead of us.

With a couple of full sea days and both Jo and Cathy's birthdays to celebrate in these first couple of days we've had to postpone Lisa's whale and dolphin ID presentation till tomorrow night. At least by then we'll have plenty of first hand experience of these mammals in the wild...

Sunday 17th March

We headed south of Pico again on Thursday and before long caught up with a large group of sperm whales socializing on the surface - about 16 of them with just a couple of males, they were spending their time lobtailing (hitting the surface of the water with their tails) and sidefluking but not diving down. Moving on, we were lucky enough to encounter a blue whale (about 30 metres long) who gave us good photo opportunities with Mt. Pico behind. Later in the day the hydrophone led us to a couple more male sperm whales - when the second of these dived Delwyn and Sue jumped in to attempt to collect skin samples. Though they saw the skin floating around in the water, they didn't manage to secure any samples. It's harder than you think!

Friday brought more sperm whale encounters in the same area along with groups of bottlenose and Risso's dolphins and more skin collection attempts.

With perfect flat, sunny conditions the POPA team made concerted observation efforts during 'turtle time' to try to find one, but no luck so far. We did come across a hammerhead shark, however, and then a fin whale was added to our species list. It also proved a good day for recording codas (noises the whales make when chatting to each other) - Oliver fixed up some software for downloading and listening to these when back at the apartments.

Yesterday the weather was much rougher though the hydrophone quickly picked up sperm whales on the other side of Pico which the lookouts had not seen. They were clearly not put off by the bouncy conditions as one of them breached in the air several times. To escape the bouncy conditions we then headed down to the corner of Faial and spent time close to a group of Risso's (the same group as yesterday, Lisa thinks).

After a full first week at sea, we're on shore today recharging our batteries. After coffee at Pete's this morning, half of the team is off with Terry Taxi on a tour round the island while others are getting to grips with the Europhlukes programme or playing pool upstairs!

Friday 22nd April

Monday was another good day at sea when we cruised down the coast of Faial as far as the lighthouse by the new land created from the volcanic explosion a few decades ago. On route we saw bottlenose and common dolphin as well as a star fish before eventually tracking down a Sei whale.

With a front moving in, Tuesday and Wednesday were then shore days where everybody had the chance to extract fins of the bottlenose, Risso's dolphins and fin whales and see how the Europhlukes programme works. Chris also had a band of willing helpers doing jobs down in the marina on the boat and developing a new in-water boat-washing method.

Yesterday we were out again, though were limited to the channel in between Faial and Pico to avoid the stronger waters. This morning has been the same, with a friendly group of about 15 to 20 Bottlenose dolphin bow-riding and diving under the boat. Having just had lunch at Pete's café we're about to go out again for the afternoon. With calmer waters we should be able to get further out, hopefully to find some goodbye cetaceans for slot one before the new team members arrive for the predicted good weather on Monday.

Wednesday 27th April

With the arrival on Monday of slot two, we did not allow them any time on shore, but rather held off with the introductory talks and training in order to head out immediately on the boat to profit from the remaining relatively calm seas.

This proved to be a good plan: Monday was a reasonable start as we were able to cruise down the coast of Faial and spend some time with a group of friendly bottlenose dolphins. Tuesday was then a grand day as after some on-boat training we were able to follow some of the whale watching boats a few miles out to where the lookouts had reported blows from a baleen whale. These turned out to be three blue whales, possibly two adults and a juvenile, our second sighting of this species this year and so far they do not seem to be animals that have been photo IDed previously. In addition we had numerous common and Risso's dolphin encounters (we have just discovered whilst sorting out the photos that some of these are the ones that were spotted during the last slot).

With the arrival of the front that Chris had been expecting from his forecasts, today has been a shore day, so everybody has been busy getting to grips with the fluke extractions, sorting out the best photo ID for each animal to be entered in to the database and helping Chris out with some jobs down on the boat.

Tuesday 3rd May

Everybody profited from the shore days over the weekend to make headway with fluke extractions, help out Chris with some painting on the boat and also have the chance to take a tour around the island and walk down from the top of the caldera.

The last couple of days have been much calmer so we've had full sea days, both with sperm whales. Yesterday we encountered a total of fourteen of them, which we were able to follow for some distance against the waves along the coast of Faial. Of these fourteen individuals, however, we were only able to get one fluke ID (a very well-worn tail, though not one which has been previously spotted). This poor record was partly due to their flukes disappearing behind the waves, but also because it seems that they were concentrating on travelling down the coast (probably to meet up with another group heading down to the same end of the island and spotted by the lookouts on the other side). Nevertheless we did have one individual pop up twenty metres in front of the boat and another who breached a couple of times for us, so we can't complain too much!

Today was similar with a large number of sperm whales but very few ID opportunities. We did, however, have our first humpback encounter of the season - having been right down to the southern corner of Faial, we eventually tracked him down out from the channel in between the two islands. In addition there were numerous common, bottlenose and Risso's dolphin encounters. A busy day and lots of work for Rachel who is now writing up all the encounters!

With six different cetacean species under slot 2's belt, they are getting very demanding for a turtle. Not sure where they are this year...

Sunday 8th May

Following slot 2's departure yesterday (and heartless abandonment by Debbie, slot 1 research assistant), I'm having my morning coffee at the Sunday bakers and thought I would take a few moments to fill you in on the last few days before I rush back up to the apartments in frenzied preparation for the arrival of our all-girl dream team tomorrow morning.

Despite slot 2's excellent turtle time observation efforts, it was clearly just not meant to be (although the on shore look-out apparently spotted a couple while we were busy with whales). So it's up to slot 3 to prove the existence of this particular species for our 2005 expedition. We did, however, have more luck with dolphins and humpback whales. Wednesday was a good dolphin day and after a shore day on the Thursday, we had another full day out on the Friday with numerous dolphin encounters and a humpback along the coast of Faial. We stayed with her for an hour or so, measuring her dive times and trying to get a good ID shot against the waves.

Lisa and Marijke are over on Pico today, visiting Dutch Risso researchers based over there, and Torsten from slot 2 is out scuba-diving with one of the local dive companies. Chris tells us that the weather is looking promising for a run of sea days next week, so I'll keep you abreast of developments.

Saturday 14th May

This last week has seen an increase in turtle action as well a large number of sperm whales.

Whilst our first sea day on Tuesday brought only a pair of common dolphin, Wednesday was a more active day: our first turtle was spotted but dived down under the boat. In between numerous common dolphin encounters, we were with a couple of male sperm whales (one of which surprisingly breached directly in front of the boat).

Our first turtles came on board on Thursday morning. The first one was pretty large and we thought we'd have a hard task getting him in to the boat, but fortunately he was pretty docile. We followed the usual tagging, measuring and crab checking procedures and had him back in the water in a few minutes. The second one came along about an hour later - smaller and easier to get on board. The rest of the day was spent quite far out at the other end of Pico with a large group of sperm whales and their young who were being very accommodating in offering their whale flukes for photo ID.

With so many other dolphin encounters including bottlenose and Risso's dolphins to waylay us on our return, we didn't get back to Horta till 6 o'clock.

Yesterday was another big sperm whale day with quite a scattered group of eighteen socializing animals. We also came across a turtle on the surface, but decided to leave him in peace as he was busy munching on a Portuguese man'o'war. Conditions were also good for trying out the new skin sample net which we place in over the back of the boat behind diving sperm whales. It seems to work quite well as a collection method, though we didn't manage to secure any samples.

Last night we burned off our remaining energies at Pete's café sport and in the local 'Crazy and Company' discotheque (a one-off experience), as today is a shore day. Now everyone is either over on Pico, driving around the island or upstairs in 2B!

Wednesday 18th May

We spent Sunday on shore, progressing with the computer work and trying to track down the happenings of the local Espírito Santo festival.

Monday was then another full sea day when we headed down to the south coast of Pico (as has often been the case this year), past the common and bottlenose dolphins to a large group of socializing sperm whales. Not bad - with a group of about 20 individuals, we obtained about 13 fluke IDs and had some rather curious animals coming close to the boat and popping their heads out of the water. We also had this slot's first encounter with striped dolphins.

Yesterday morning we cruised down the side of Faial to keep in shelter from the winds and had some bracing roller-coaster waves for our return back to harbour. We came across a couple of common dolphin groups but decided on the shore option for the afternoon. We had quite a productive time matching as we discovered that Monday's curious sperm whale with a hole in his fluke had also been spotted by Lisa several times during July and August 2004: since then he's developed a couple more scallops and a nick along his fluke, but still retains his distinctive shape and hole.

Pete from the café is having his eightieth birthday party this evening. Then with excitement mounting for the Eurovision Song Contest qualifying rounds tomorrow evening followed by our last supper on Friday evening (coupled with good forecasts for the last two days), we're set for a gun-shot end to the 2005 expedition. Having being spoilt by the turtles and an excess of sperm whales, slot 3 have placed their order with the baleen whales.

Friday 20th May

Hi to everyone involved in the 2005 Azores Whale and Dolphin surveying expedition. It's late in the evening on our last day here in Horta, and for once I was not the last to leave Pete's café sport - most of the team are still down there, perched on the harbourside soaking up the atmosphere, but I thought I would take the opportunity to send you a last diary entry before everyone hops on the plane tomorrow.

We had a great last day out today - reports from the look-outs took us up the coast of Faial and before long and with a little help from the hydrophone, we had tracked down our faithful friends, the sperm whales.

First of all spotted the solitary males, then a large group of females (the same group as last time) before coming across the males again on our return in to harbour. A contrast to yesterday where there was nothing much to report apart from a couple of dolphin encounters. By mid-afternoon we decided to stop off at Madalena on Pico and half of the team jumped off and caught the later ferry back across the channel, arriving just in time for the BBQ.

Slot 3 have certainly been strong on their sperm whales - 65 encounters in total and a total of 98 animals! Not so many baleen whales - one theory is that the northern winds have pushed the krill further out meaning the baleen whales have not been coming in so close. And at least slot three has provided proof that the turtles really are out there - honestly!

We've certainly achieved lots of useful research and had lots of fun here at basecamp this year, so thanks to everyone who has participated and contributed to making the expedition a success. Chris and Lisa now have a break before they continue with their regular research in June. Hope you're all enjoying your time post-Azores!