

Universidade de Lisboa  
Faculdade de Ciências  
Departamento de Biologia Animal



An Assessment of the Potentiality of Whale-Watching in Two  
Marine Protected Areas and Adjacent Waters, in Portugal, as a  
Tool for Nature Conservation

Inês Taveira Gonçalves

Dissertação  
Mestrado em Biologia da Conservação

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Doutora Cristina Brito

Professor Doutor Henrique Cabral

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Como quando do mar tempestuoso  
o marinheiro, lasso e trabalhado,  
d'um naufrágio cruel já salvo a nado,  
só ouvir falar nele o faz medroso;  
e jura que em que veja bonançoso  
o violento mar, e sossegado  
não entre nele mais, mas vai, forçado  
pelo muito interesse cobiçoso;  
Assi, Senhora eu, que da tormenta,  
de vossa vista fujo, por salvar me,  
jurando de não mais em outra ver me;  
minh'alma que de vós nunca se ausenta,  
dá me por preço ver vos, faz tornar me  
donde fugi tão perto de perder me.

Como quando do Mar Tempestuoso (1598) Luís Vaz de Camões



## ACKNOWLEDGMENTS

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This thesis could not have been done without the help of several people.

To *Escola de Mar* team, especially for the guidance, support and patience through this thesis of Cristina Brito.

To professor Henrique Cabral for the feedback and ideas on how to analyze all data.

To SPEA team for the data on seabirds and cetaceans, help in working with ArcGIS, the opportunity to explore the economic side of tourism on MPA and the amazing fieldwork.

To all the operators (Mar Ilimitado, Atlantic Safaris, Dream Wave, Dolphins Driven and Cape Cruiser) that help me in obtaining data that allowed the realization of this project. To the people that collected questionnaires besides the operators (AIMM team, Erica Sá and others).

To all my friends and family who help me out with this thesis in so many ways, especially with translations, distribution and answering questionnaires.

To my boyfriend a special “thank you” for the continuous support, feedback and help through all the process. I love you!

Thanks to all of you!

## AUTHOR'S DECLARACION

---

Relevant early results of this work were presented in the form of poster at:

### **ECS Galway 2012, the 26th European Cetacean Society Annual Conference**

26-28 March 2012, Galway, Ireland.

“Potential to develop whale watching activities in two Marine Protected Areas in the Portuguese coast: a first approach” Gonçalves, I.T.; Vieira, N.; Teixeira, A.; Carvalho, I.; Cabral, H. and Brito, C.

and

“Using platforms of opportunity in Nazaré (Portugal): Cetaceans’ occurrence and preliminary results on the whale watching activity in the area” Sá, E.; Ferreira, C. V.; Vieira, N.; Gonçalves, I.T. and Brito, C.

### **IMMR 2012 – International Meeting on Marine Resources**

24-25 May 2012, Peniche, Portugal.

“Using platforms of opportunity in Nazaré (Portugal): Cetaceans’ occurrence and preliminary results on the whale watching activity in the area” Sá, E.; Ferreira, C. V.; Vieira, N.; Gonçalves, I.T. and Brito, C.



A observação turística de cetáceos nasceu em San Diego (U.S.A.) em 1950 com observações feitas a partir de terra e cinco anos depois, no mesmo local, surgem as observações em embarcações. Em 2008, já existem cerca de 30000 participantes distribuídos por 119 países. Em Portugal, a atividade começou em 1992 nos Açores, como alternativa à caça à baleia, indústria que estava em declínio nos últimos anos. Atualmente está implementada por quase todo o território português, com maior incidência nos arquipélagos dos Açores e Madeira e na região sul do continente. As Áreas Marinhas Protegidas (AMP) e águas adjacentes são particularmente importantes como plataforma para estas atividades pois retêm vários benefícios naturais, científicos, sociais, educativos e económicos. Investigação básica, monitorização, programas educativos e incentivo a agir, assim como fundos para a conservação podem ser fornecidos pelos operadores turísticos. Por outro lado, a manutenção da própria AMP pode fornecer uma maior abundância e diversidade de espécies e habitat que outras áreas. Da mesma forma que as AMP são plataformas com vantagens de utilização, também os cetáceos como animais carismáticos e espécies “guarda-chuva” são ideais para o desenvolvimento de atividades turísticas e a conservação dos ecossistemas em que estão inseridos. Os cetáceos são mamíferos marinhos divididos em duas sub-ordens, Mysticeti (baleias de barbas) e Odontoceti (baleias com dentes), que agrupam cerca de 86 espécies no mundo. Em Portugal é possível encontrar cerca de 25 espécies em todo o território (arquipélagos e continente) contudo, estudos contínuos sobre a sua ocorrência ainda são reduzidos. O facto da incerteza de avistamento de cetáceos poder influenciar a satisfação do turista na atividade, fez com que se optasse por caracterizar a ocorrência e distribuição de aves marinhas como atividade complementar à observação de cetáceos. Existem cerca de 334 espécies de aves marinhas no mundo sendo que 20 destas nidificam em território português, para além das que utilizam a área durante as migrações. Para além disso, estas espécies atraem um grupo diverso e abundante de turistas para Portugal todos os anos. Para determinar a potencialidade de atividades turísticas de observação de cetáceos em AMP e águas adjacentes, objectivo principal desta tese, foi feita a caracterização da ocorrência e distribuição de cetáceos e a caracterização do turista atual e potencial da atividade. Foram utilizadas como áreas de estudo a Reserva Natural das Berlengas (RNB) e o Parque Marinho Professor Luíz Saldanha (PMLS). Para avaliar a ocorrência de cetáceos, foram feitos 100 embarques entre 2005-2012 com metodologia ESAS, 90 em *ad-libitum* entre 2007-2012 e 19 com transetos a partir da costa desde 2011. Foram distribuídos 219 inquéritos entre os atuais turistas da atividade em 3 locais: Albufeira, Sagres e Nazaré. Para os inquéritos que pretendem

determinar um perfil para um potencial turista a ser atraído para a atividade foram realizados 683 inquéritos online e 227 nas duas localidades Peniche e Sesimbra. Através dos embarques foram detectadas 6 espécies de cetáceos (5 Delphinidae e 1 Balaenopteridae), o SPUE calculado foi de 0.225 para Peniche e 0.281 para Sesimbra e a taxa de avistamento foi de 35% e 55%, respectivamente. As espécies mais comuns e presentes todo o ano foram o roaz e o golfinho-comum, sendo que o primeiro foi encontrado mais próximo da costa nas duas AMP. Levou cerca de uma hora até ao primeiro avistamento nas duas áreas. Em relação às aves marinhas estas são representadas por 32 espécies no local sendo que a maioria é avistada próximo da costa e durante as duas migrações (primaveril e outonal). No que diz respeito à caracterização dos turistas atuais da atividade, estes têm na sua maioria entre 25 a 45 anos, uma ligeira maior proporção de mulheres, mais estrangeiros e empregados, nível superior de educação concentrado nas áreas de ciências, economia, gestão e prestação de serviços. A maioria dos grupos era constituída por famílias, tendo como principal motivação para fazer a atividade ver cetáceos. A maioria das pessoas gostaria de estar perto dos animais mas notou-se uma redução nessa preferência na segunda parte do questionário de 92% para 50%. O conhecimento sobre as espécies que ocorriam em cada área, por parte dos turistas, foi baixo, sendo que a maioria dos turistas não conseguiu identificar a espécie observada. No que diz respeito aos turistas potenciais desta atividade, a maioria tinha conhecimento da existência deste tipo de turismo em Portugal. O tipo de viagem mais desejado pelos turistas potenciais inclui 3 horas de duração, barco com capacidade para 12 pessoas, verão como estação mais escolhida e as ilhas (Açores e Madeira) como destino preferencial. A maioria dos inquiridos não sabia qual seria a taxa mínima de avistamento que iria requerer para fazer a atividade mas, das pessoas que escolheram um valor, a maioria estava incluída na categoria de 61-80%. Os dois tipos de turistas foram comparados em vários parâmetros, entre eles a sua posição em relação ao possível impacto da actividade, a realização prévia da atividade e o valor pelo qual estavam dispostas a pagar pela mesma e o interesse em realizar outro tipo de atividades complementares. Houve um aumento no número de pessoas no fim da viagem que achavam que a viagem poderia ter impacto negativo sobre os animais e a grande maioria dos turistas potenciais considerou a possibilidade de existência de impacto como um impedimento para a realização da mesma. Cerca de 37% de todos os inquiridos já tinham feito observação de cetáceos antes e na sua maioria pagariam mais de €35. Pelo contrário as pessoas que nunca fizeram a atividade estavam dispostas a pagar menos. Tanto a observação de outra fauna (na maioria aves marinhas e peixes) como a interpretação ambiental, foram atividades turísticas que a maioria das pessoas mostrou interesse em realizar, demonstrando o potencial das mesmas para serem realizadas em conjunto com a observação de cetáceos. Resultados dos

dois capítulos indicam que existe um certo nível de incerteza para conduzir atividades turísticas dedicadas à observação de cetáceos mas tanto a presença de um grande número de aves marinhas como o facto da maior parte dos turistas não exigir um valor muito diferente da atual taxa de avistamento para os cetáceos potenciam a ocorrência da atividade na área de estudo. Os resultados também elucidam para a necessidade de se implementarem programas de educação ambiental a bordo. Em Portugal ocorre a prática do turismo de natureza, que tem sobretudo uma motivação para interagir com a natureza através de atividades de baixa intensidade, como a observação de fauna, ou a prática de desportos náuticos, pode ou não ter como objetivo de obter benefícios de conservacionistas, socioeconómicos e educacionais. A gestão destes domínios é necessária para desenvolver uma atividade sustentável em Portugal. O valor económico associado à observação de cetáceos e o impacto das embarcações sobre os animais seriam projetos a definir na sequência desta tese pois sem estes dois parâmetros, não é possível desenvolver uma atividade sustentável. A todas estas vantagens se junta o fato de que Portugal é um destino de escolha para atividades de lazer e tem a maior parcela do total de receitas de turismo na Europa relativas à observação de cetáceos. Portugal apresenta, assim, um grande potencial de crescimento turístico, desenvolvimento de programas educativos e criação de uma atividade sustentável necessária para a conservação dos ecossistemas sensíveis das AMP.

**Palavras-chave:** turismo, cetáceos, turistas, AMP, avistamento.

## ABSTRACT

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MPA and adjacent waters can benefit from general increase in abundance of populations compared to other areas, and the use of whale-watching tourism can have conservationist advantages as platform of opportunity for investigation, regular monitoring of the area and revenues obtain for the management cost of MPA. As such, the assessment of the potentiality of whale-watching in MPA areas, RNB in Peniche and PMLS in Sesimbra (both mainland Portugal), is needed. Boat-based surveys were used to evaluate the occurrence and sighting rates of different cetacean species. Since in some regions, the uncertainty of cetacean sightings may limit the activity leading operators to include other complementary activities, occurrence of different seabirds species was also ascertained. There was also a need to determine the current and potential tourists of this kind of activity resorting to the distribution of questionnaires within 5 operators in Sagres, Nazaré and Albufeira for the first and in Peniche and in Sesimbra and online for the second. Both MPA comprise 6 species of cetaceans and 32 species of seabirds, with the more common present all year. The sighting rates calculated were relatively low. Results indicate that a level of uncertainty does exist to conduct dedicated whale-watching tourism activities but were close to the sighting rate required by tourists. Tourists also would want to see seabirds and profit from environmental interpretation. This could lead to a better understanding and management of the two MPA and related maritime activities.

**Keywords:** whale-watching, whale-watchers, MPA, sightings.

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CHAPTER 1: INTRODUCTION

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**1.1 Whales and dolphins as conservation ambassadors**

Cetaceans include two suborders of marine mammals, Mysticeti (baleen whales) and Odontoceti (toothed whales) and comprise about 86 species worldwide (Dalebout *et al.* 2002b). They have a major success among people because of their flamboyant behavior and therefore encourage people to provide help in conservation of these animals. Obtaining information about them is extremely important as these animals represent the top of the food chain and disturbances in the structure of their populations can lead to disequilibrium of some marine ecosystems.

Whale-watching is the human activity of encountering cetaceans in their natural habitat which does not include swimming with trained animals or observation of captive animals (Hoyt 2002). It can involve boat, helicopter, plain or observation from land points (O'Connor *et al.* 2009). San Diego (U.S.A.) was the place of birth of whale-watching, through land-based activity in 1950 and boat-based in 1955, both looking for gray whales (*Eschrichtius robustus*) on winter migration (Hoyt 2001). Only after the International Whaling Commission's (IWC) moratorium on commercial whaling in 1982, whale-watching began to be seen as a financial alternative to whaling and had in 2008, 30000 participants per annum distributed through 119 countries (Figure 1-1) (O'Connor *et al.* 2009).



Figure 1-1: Map of the global distribution of whale-watching countries (countries marked in black had whale-watching activities in 2008) (O'Connor *et al.* 2009).

**1.1 Advantages of whale-watching on marine protected areas**

The decline of natural stocks of several marine species has led to the need for measures to mitigate this situation and promote the recovery of population (Tuya *et al.* 2000). One action

that can be taken is the establishment of Marine Protected Areas (MPA), “a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values” (Dudley 2008). They can allow, in some sections, the development of extractive activities such as fishing or non-extractive activities, like tourism (Abdulla 2009).

Protected areas are usually the platform for the practice of marine tourism, owning major natural-based, scientific, social, educational and economic benefits that can assist in the conservation of local ecosystems (Agardy 1993, Barnes 1996).

When referring to whale-watching both operators and MPA managers benefit from it, the first with information on where cetaceans can be found and the others with basic research and constant monitor covered (Hoyt 2005). The presence of a researcher on the boat can serve as guide and can guarantee the fulfillment of the codes of conduct to reduce the impact of the boats on the animals (Hoyt 2005). This is important for species within the MPA, either rare species with or without conservation status of risk, or charismatic umbrella species, both with the power to attract more tourists (Tapper 2006).

Tourists can also benefit with whale-watching either by the aesthetic value of the activity or with the privilege of becoming part of the effort in conservation of the animals and the ecosystem, ultimately turning into active volunteers (Orams 1996, Weaver 1998, Diamantis 1999). Weber (1993) refers the sensitivity express by visitors related to the quality of the tours resulting, for instance, in lower appreciation when higher numbers of people are present. This can be of advantage in preventing the turning of whale-watching into “mass tourism”, particularly important in sensitive ecosystems like MPA.

An educational component is preferred by whale-watchers in general which could require the use of interpretation programmes to improve the experience (Diamantis 1999, Hoyt 2005).

From an economic perspective, besides start-up, ongoing and other basic expenses, it is important to account the contribution to local conservation and local communities. It is clear, in particular in MPA, that part of the revenue should be directed to fund conservation efforts, with benefits to operators that enhance correct development (Hoyt 2005). Local communities benefit directly from the employment generated and the potential links with other local economic sectors (Diamantis 1999).

### **1.2 Worldwide changes**

Despite the major whaling industry, Japan has the largest revenue generated within whale-watching industry in Asia, with some national regions having a conservation perspective while others have fishermen taking tourists to get extra money and no intent to do a sustainable tourism since they are against whale-watching, thinking that it may harm whaling in the future (O'Connor *et al.* 2009). For Iceland, fishing and hunting has been a local tradition with this sector representing 90% of all exports in the early 1960s but due to the decrease in cod fish quotas and the individual transferable quota system, whale-watching started as one economic alternative (Hoyt 2001, Einarsson 2009, O'Connor *et al.* 2009). The conflicts remains, with



fishermen seeing whales more as substitutes to fishing resources and disturbance during both activities and competition for space in port installations occur, leading to the possibility of returning to whaling activity (Einarsson 2009, O'Connor *et al.* 2009).

There are a number of communities with substantial changes through whale-watching and the terminus of whaling. One of the largest in the world is New Zealand, operating for over 20 years, representing a model country in relation to government management which includes funding for research and a permit-based system to control the number of boats on the water (Donoghue 1994, Hoyt 1995, O'Connor *et al.* 2009).

Mainland Spain have a larger sighting of dolphins than whales and within tourists visiting the country, only a small portion do whale-watching trips but the number of whale-watchers has a notable growth of 11.6% per year (O'Connor *et al.* 2009). The major activity occurs outside the mainland, in the Canary Islands, with different growth scenarios between islands with some having larger vessels doing an opportunistic activity with snorkeling and others with less developed infrastructures and lower numbers of trips, all in smaller boats exclusively dedicated to sighting cetaceans (O'Connor *et al.* 2009). Worldwide, several times this activity is complemented with other marine activities in order to fulfill the satisfaction of the client (O'Connor *et al.* 2009).

Whale-watching, like any human activity has an impact, positive and negative. In relation to negative impacts on cetaceans, they are mainly associated with the proximity to the animals and how this will influence their behaviours patterns, especially during critical phases (reproduction, feeding and resting) (Shane *et al.* 1986, Orams 1997). Guidelines and codes of conduct attempt to mitigate the impacts of vessels on animals establishing, for example, distance and length of time spent for minimum negative impact. For people, the negative impact is related essentially with the possibility of vessels accidents at the site (Orams, 1997). As positive impacts on cetaceans, stimulation through play allow the juvenile to practice and learn skills essential to their survival (Orams, 1997) and the growing interest and more environmentally responsible behaviour of humans can have long term benefits for cetaceans in conservation and assistance in stranding and injuries (Orams 1997, Amante-Helweg 1995). People can get educational, economic and scientific benefits from the activity as well as satisfaction since cetaceans can engage in exhibitionistic social behaviour, opposed to other mammals, and thus appealing to most tourists (Orams 1997, Amante-Helweg 1995, Hoyt 1996).

### **1.3 Case study: Portugal**

Even though commonly used to label nature-based tourism, ecotourism is not usually occurring in Portugal. It is more common the practice of nature-based tourism which mainly have a motivation to interact with nature through low intensity activities like the observation of different animals, or the practice of nautical sports, with or without the aim of getting conservation, socioeconomic and educational benefits characteristic of ecotourism (Ceballos-Lascuráin 1996, Orams 1996, Turismo de Portugal 2007). Planning with these domains is needed to begin a sustainable activity in Portugal.

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Whale-watching started in Azores at 1992 with the whaling ending in 1987, due to the decline of economic revenue (REOT-A 2005, O'Connor *et al.* 2009). Land-based point lookouts to spot whales were re-used by operators to help finding the animals (Gonçalves and Prieto 2003). Whale-watching tourism exists mainly in the archipelagos (Azores and Madeira) and in some regions of mainland, mostly in the south (Algarve), with codes of conduct regulation defined in D.L. nº9/2006 of January 6 (mainland) and R.D.L. nº2/2006/A (Azores). The Autonomous Region of Madeira is still pending approval to regulate the activity, with the Museum Whale Madeira using a Voluntary Regulation of Assessment (RAV).

Regional Directorate of Tourism of the Azores considers whale-watching the primary touristic source of income in Azores, with an annual grow of 15,5% between 1998 and 2008 and occurring in almost every islands with seasonal or annual trips and some opportunistic tours with diving or nature cruises (O'Connor *et al.* 2009, Hoyt 2003). Madeira Archipelago has a larger growth than Azores (in 73% per annum), with the departing port in Funchal and trips that go to the surrounding islands to offer dedicated or opportunistic trips (O'Connor *et al.* 2009).

In mainland Portugal whale-watching began in 1998 with a growth of 1380 to 58000 whale-watchers until 2008, with operators distributed among Nazaré, Setúbal and the south coast in the Algarve (Figure 1-2). Essentially dolphin-watching is done because of the difficulty in spotting whales and can also be combined with other type of nature cruises (O'Connor *et al.* 2009).

Portugal is a destination of choice for leisure activities and has the largest portion of touristic total revenues in Europe so whale-watching possibly has a great potential to growth with a sustainable and well planned development, essential for the reduction of negatives impact to a minimum (O'Connor *et al.* 2009, Turismo de Portugal 2012).

Within Portugal there are several MPA with different physical, chemical, geological and biological features: 9 in Azores; 5 in Madeira Archipelago and 4 in the mainland. The study areas comprise two of the four mainland MPA, *Reserva Natural das Berlengas* (RNB) in Peniche and *Parque Marinho Professor Luíz Saldanha* (PMLS) in Sesimbra. There are about 25 cetacean species distributed thought the islands and in the mainland coast, however, the information available about their occurrence is still very sparse (Cabral *et al.* 2005).

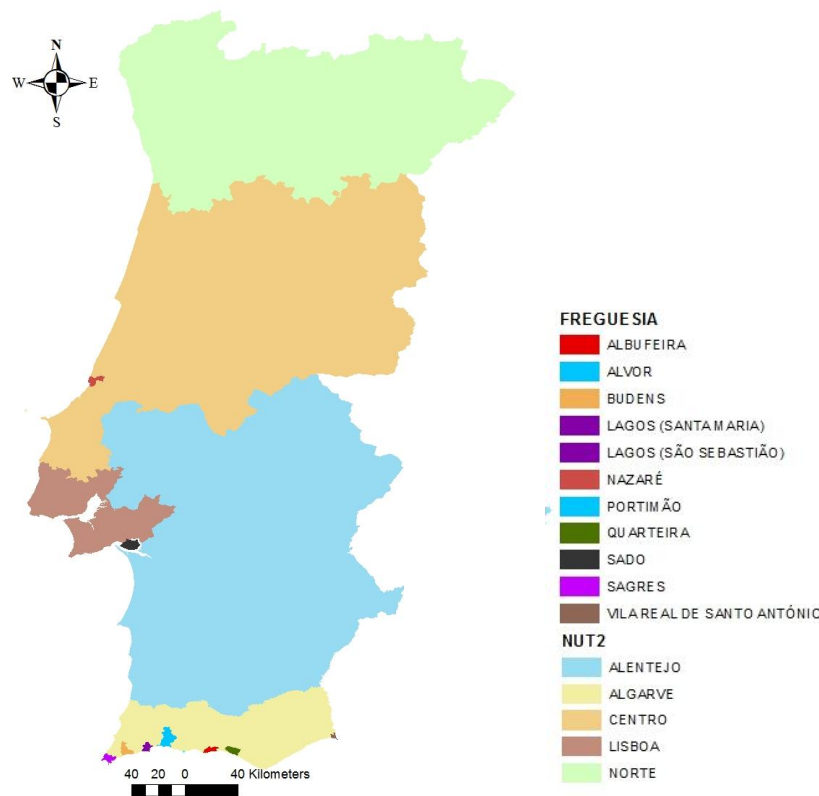


Figure 1-2: Map of the distribution of whale-watching enterprises among different territorial units (Freguesias and NUT 2)

## 1.4 Objectives

This work has relevance at various levels and had never been conducted before in some of the study areas. Whale-watching can serve as an important mean for conservation of species and ecosystems through environmental education, finance support and scientific knowledge. Through their link to economic valuation of ecosystem services, it can serve as a strong way to captivate the decision makers to conservation causes.

Assessing ecosystem and populations status can lead to a better understanding and development of MPA. MPA have multiple advantages on tourism and despite its creation of the MPA may have been for reasons other than the presence of cetaceans species, in general MPA and adjacent waters represent important nursery areas for top predators such as them.

Since previous studies (e.g. Vieira *et al.* 2009) indicate a probable low sighting rate in the two areas hence we chose to evaluate the viability of using seabirds as an alternative. Seabirds are used in other countries to complement whale-watching and in Portugal a large number of species and high sighting rates of some do occur (Catry *et al.* 2010).

The characterization of current whale-watcher profile is important for the correct establishment of any economic activity and to understand the capacity of environmental

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education to encourage the tourist to support marine conservation. There is a need to determine if there is broader profile that can benefit from this activity.

So, the main goal of the present study is to evaluate the potentiality of whale-watching in the two MPA, RNB in Peniche and PMLS in Sesimbra. In order to accomplish the main goal, it was necessary to study three different subjects as follows.

1) Characterization of occurrence and distribution patterns of different species of cetaceans in these two areas and their sighting rates;

2) Determine the viability of the alternative seabird-watching to complement the whale-watching activity; and,

3) Social characterization of the tourists and potential clients who will use this kind of activity and the regions.

The first two objectives are addressed in Chapter 2 while the third is addressed in Chapter 3.

## CHAPTER 2: POTENTIAL FOR WHALE-WATCHING DEVELOPMENT IN TWO MARINE PROTECTED AREAS AND ADJACENT WATERS IN PORTUGAL: CETACEANS AND SEABIRDS AS COMPLEMENTARY OBSERVATIONS TARGETS

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Gonçalves, I.T.<sup>1,2,3</sup>, Carvalho, I.<sup>1</sup>, Meirinho, A.<sup>2</sup>, Oliveira, N.<sup>2</sup>, Cabral, H.<sup>3</sup> and Brito, C.<sup>1</sup>

<sup>1</sup>Escola de Mar, Edifício ICAT, Campus da FCUL, Campo Grande, 1749-016 Lisboa, Portugal

<sup>2</sup>Sociedade Portuguesa para o Estudo das Aves, Avenida João Crisóstomo N18 4D, 1000-179 Lisboa, Portugal

<sup>3</sup>Centro de Oceanografia, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal

### 2.1 Abstract

*Based on general increase in abundance of populations in marine protected areas (MPA) compared to other areas, whale-watching tourism in those areas and in adjacent waters can have conservationist advantages as platform of opportunity for investigation, regular monitoring of the area and revenues for the management cost of MPA. However, in some regions, the uncertainty of cetacean sightings may limit the activity so operators need to include other complementary activities or observations. As such, the assessment of occurrence different pelagic species (cetaceans and seabirds), time to cetaceans sighting and rates, in two study areas, Reserva Natural das Berlengas in Peniche and Parque Marinho Professor Luíz Saldanha in Sesimbra (both mainland Portugal) was conducted to evaluate the potential for whale-watching tourism. Through boat-based surveys, 6 species of cetaceans were found, 5 Delphinidae and 1 Balaenopteridae. The SPUE and sighting rate calculated for Peniche was 0.255 and 35%, for Sesimbra was 0.281 and 55%. Tursiops truncatus and Delphinus delphis are species present all year round, the first found closer to shore for both areas. It took at least one hour to the first sighting. Seabirds had representatives of 31 species in total, the majority sighted closer to shore and during the two migrations (spring and fall to both regions). Results indicate that a level of uncertainty does exist to conduct dedicated whale-watching tourism but the presence of a large number of seabirds could be used to improve the activity. This information can lead to a better understanding and management of the two MPA and related marine activities.*

**Keywords:** tourism, MPA, occurrence, Peniche, Sesimbra.

### 2.2 Introduction

MPA can be used to limit extractive and non-extractive activities like tourism that can lead to major advantages in enduring the safeguard of species, wildlife research, economic benefits for the local communities and also generating revenues that could be used to offset

management costs of the MPA (Abdulla 2009, Walpole and Goodwin 2000). Mainland Portugal has 4 MPA: *Reserva Natural da Berlenga* (RNB) was the first in 1981, followed by *Parque Natural do Sudoeste Alentejano e Costa Vicentina* (1995), *Parque Marinho Professor Luiz Saldanha* (PMLS) (1998) and *Parque Natural do Litoral Norte* (2005).

In recent years opportunistic observations, whaling data, historical and strandings studies indicate the presence of a total of 25 species of cetaceans in Portugal (Cabral *et al.* 2005, Brito *et al.* 2009) but continuous information is still sparse and touristic activities for their observation in the wild are still in the beginning in some coastal regions. On the contrary, in the Sado estuary, central coast of Portugal, lives the only known resident population of bottlenose dolphins, which has been continuously studied for several decades and here tours have been taking place regularly since, at least, the 1990s (dos Santos and Lacerda 1987, Harzen and dos Santos 1992, dos Santos *et al.* 2007).

One factor that seems to be limiting the number of operators prepared to begin whale-watching in some places is the uncertainty of cetacean sightings (Hoyt 2001, Warburton *et al.* 2001). Is essential for the operators to be able to ensure that passengers are not disappointed when not finding cetaceans, perhaps by including on their activity the observation of other species easier to locate, such as seabirds. Of the 334 recorded species of seabirds in the world, 20 breed in Portugal (Equipa Atlas 2008) and many use the mainland during their migration. The occurrence of seabirds on MPA can also be relevant since bird-watching attracts a significant number of tourists to Portugal every year and seabird-watching, which consist of the observation and identification of seabirds, is a growing activity around the world (Jones and Buckley 2001, Poole *et al.* 2011).

In this work, main goals were: (1) to assess the occurrence of different cetaceans and seabirds species within and in the vicinity of two areas with MPA (Peniche and Sesimbra, west coast of Portugal); (2) to estimate indicators of success of the activity, such as time and distance to the first sighting and sightings rates for cetaceans; and (3) to discuss the potentiality of observation of both pelagic species as complementary observations.

### **2.3 Methods**

#### Study area

The surveyed areas included two MPA and adjacent waters situated on the Portuguese coast: RNB in Peniche, and PMLS in Sesimbra (Figure 1). The Berlengas Archipelago is located on the Continental Shelf at 10.5 km west of Cabo Carvoeiro (Peniche) and consists of three groups of islets: Berlenga Grande and adjacent reefs, Estelas and Farilhões. The MPA is about 102 km<sup>2</sup> which surrounds seabirds nesting habitat and an important place of passage for migratory birds (Queiroga *et al.* 2008), with a Special Protection Area (SPA) for Wild Birds and integrated in the Natura 2000. The study area of Peniche has boundaries coincident with the Important Bird Area (IBA), ca. 2073 km<sup>2</sup> (Ramirez *et al.* 2008) (Figure 2-1). Parque Natural da Arrábida exists since 1976, including only the terrestrial area at that time. With the requalification in 1998, PMLS was created with an area of 53 km<sup>2</sup>, extending to 3.7 km of the cost line, from the shallows of the entrance of Sado estuary (Praia da Figueirinha) up to the to

North landforms of Cape Espichel (Praia da Foz) (Gonçalves *et al.* 2002b). The PMLS is also included in the list of Natura 2000 - Site Arrábida-Espichel. Sesimbra study area includes PMLS and the adjacent marine area, ca. 2108 km<sup>2</sup> (Figure 2-1).

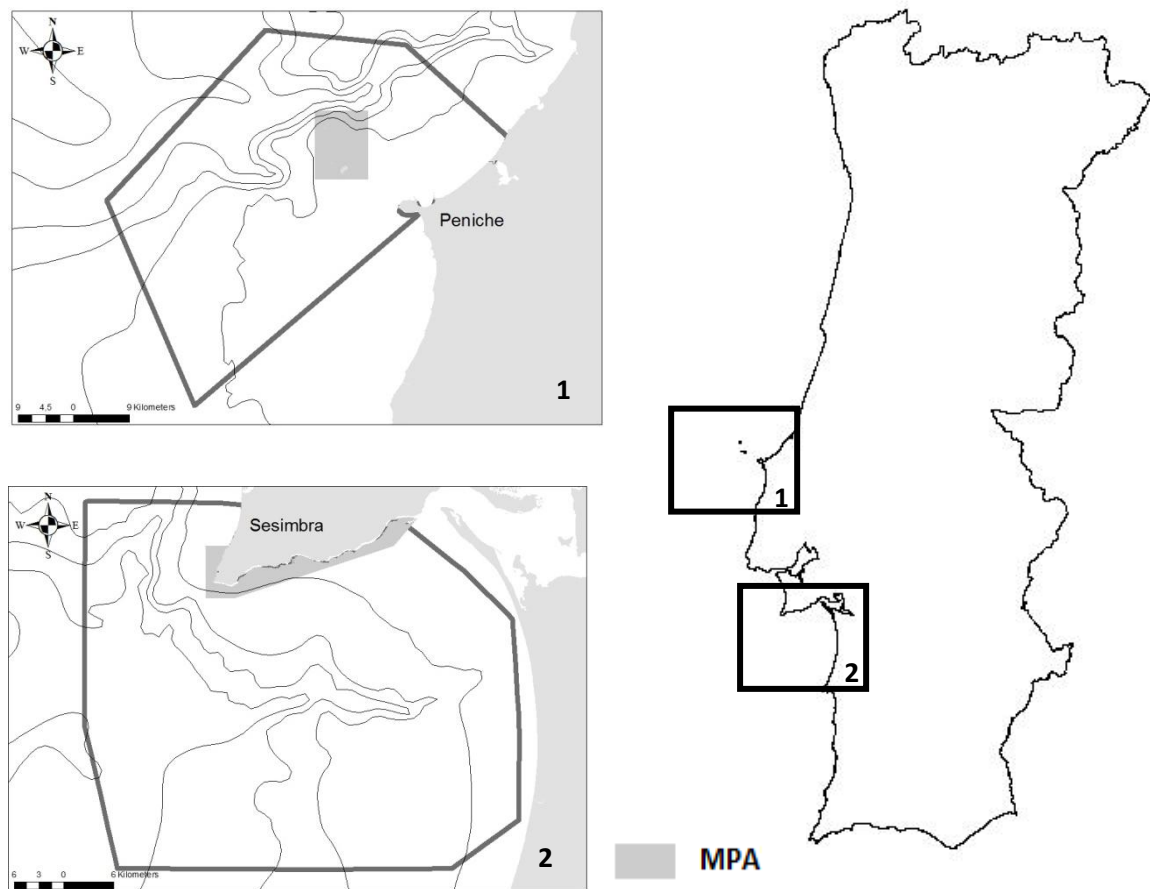


Figure 2-1: Study areas represented with grey boundaries and the two MPA in grey polygons: (1) *Reserva Natural das Berlengas* (RNB) in Peniche (above) and (2) *Parque Marinho Professor Luíz Saldanha* (PMLS) in Sesimbra (below).

### Data collection

A total of 209 boat-based surveys were obtained with a total effort of 34667 minutes at sea.

The current study included three different methodological approaches to collect sightings of cetaceans and seabirds. Boat-based surveys were conducted under a Beaufort sea-state inferior to 4 and generally at speed above 5 knots.

In European Seabirds At Sea (ESAS) methodology (latter referred as Ma), data was collected from the two locations (Peniche and Sesimbra) from February 2005 to February 2012 and surveys were conducted from different ships using standard methodology ESAS protocols (Tasker *et al.* 1984). For survey methodology Ma, a base component (with information on date, time, position, observers and environmental conditions) recorded at regular intervals and using a Global Positioning System (GPS) and a bird component (records of birds, marine

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mammals and fishes) were obtained. The recording of birds and cetaceans was done within a 90° scan and 300 meters wide strip transect in 5 minute intervals and with a minimum of one observer stationed at one side of the boat scanning the area. A snapshot method which “freeze-frames” flight within sections of the transect was used to sample flying birds.

In *ad-libitum* boat surveys in Sesimbra (latter referred as Mb), data was collected in Sesimbra from January 2007 to February 2012, aiming to acquire greatest spatial coverage and included an area perpendicular to the coastline to a maximum of 18.52 km off the coast.

In line-transects boat surveys in Sesimbra (latter referred as Mc), data was collected in Sesimbra from May 2011 to March 2012. Perpendicular transects were designed using the software Distance 6.0 release 2 (Thomas *et al.* 2010), with a distance between them of 3.7 km and a length of 11.1 km. They were performed monthly, with a random order and direction (from land to shore or shore to land).

During the surveys in Sesimbra (Mb and Mc) a minimum of one observer was stationed at each side of the boat scanning an area right ahead the vessel to approximately 135° from its bow. Whenever cetaceans were sighted species identification and GPS positions were recorded.

### Data analysis

All data was used, i.e, within and outside the ESAS transect, *ad-libitum* and line-transects boat surveys since the main aim was to collect data on the occurrence of cetaceans and seabirds and not density estimation. With ArcGIS 10.0 occurrence maps were produce and since a greater number of seabirds species occur, data was binned into a spatial grid with cell size 4x4 km to determine grids with higher number of species. The size of the study areas were based on the IBA created to Peniche to evaluate a proposed area for protection. For Sesimbra, the spatial grid was made with approximately the same area. Physical variables like depth (from Portuguese Hydrographic Institute website), distance to shore and distance to the closest port were considered invariant throughout the period of this study. To analyse differences in the habitat use a Mann–Whitney U-test (Statistica v.9) were used for depth, distance to shore and distance to the closest port. Time to the first sighting and duration of the trip were also target of this test.

The SPUE (sighting per unit of effort) was calculated as the number of cetaceans groups per time at sea, in each area: number of sightings / survey effort x 60 min. Also a sighting rate was indicated: number of boat-based surveys with sightings of cetaceans / total number of boat-based surveys x 100 (Table 2-2). Both calculations are used to help compare this study values with values from the companies, that normally use sighting rate and with scientific research that take into account the effort value.

To determine the time of the first sighting with data collection Ma and Mc we consider the first cetacean sighting of each transect. For Mb the first sighting of the trip were considered.



In spite the observation of other species of birds, only seabirds will be taken into account and their occurrence will be divided in 4 classes: Winter (December, January and February), Spring (March, April and May), Summer (June, July and August) and Fall (September, October and November). Seabird species encountered with less than 40 individuals were classified as rare.

## 2.4 Results

### Cetaceans and seabirds occurrence

Table 2-1: Sightings for different cetacean species in Peniche and in Sesimbra.

Species			Sightings (%)		N	
Family	Common name	Scientific name	Peniche	Sesimbra	Peniche	Sesimbra
Delphinidae	Shot-beaked common dolphin	<i>Delphinus delphis</i>	58	60	15	85
	Common bottlenose dolphin	<i>Tursiops truncatus</i>	19	29	5	41
	Pilot whale	<i>Globicephala melas</i>	4		1	
	Risso's dolphin	<i>Grampus griseus</i>	12		3	
	Striped dolphin	<i>Stenella coeruleoalba</i>		5		7
Balaenopteridae	Minke whale	<i>Balaenoptera acutorostrata</i>		2		3
	Unidentified dolphin		8	4	2	6

Table 2-2: Summary of effort and sightings of cetaceans for each method and area.

Area	Data collection method	Number of boat-based surveys	Number of boat-based surveys with sightings of cetaceans	Sighting rate (%)	Number of sightings of cetaceans	Effort (minutes)	SPUE
Peniche	Ma	45	16	35	26	6110	0.255
	Ma	55	20		48	8295	
Sesimbra	Mb	90	53	55	66	14653	0.281
	Mc	19	18		21	5609	
	Total	209	107	-	160	34667	-

Cetaceans identified in 161 sightings correspond to 6 species, 5 from the *Delphinidae* family and 1 from *Balaenopteridae* (Table 2-1). There were 6 sightings of mixed groups of short-beaked common dolphin and striped dolphin in Sesimbra. The SPUE was calculated based on all species and sum of effort for each area, resulting in 0.255 in Peniche and for Sesimbra 0.281 (Table 2-2). The sighting rate for Peniche was 35% and for Sesimbra was 55%.

For birds, a total of 17 different families were sighted, 12 for Sesimbra and 15 for Peniche, 9 of them were seabirds and the remaining were landbirds or waterbirds. The total of seabird species was 25 for Sesimbra and 26 for Peniche, with 31 different species in total. The more

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common species were northern gannet (*Morus bassanus*), yellow-legged gull (*Larus michahellis*), common scoter (*Melanitta nigra*), Cory's shearwater (*Calonectris diomedea*), great skua (*Stercorarius skua*), lesser black-backed gull (*Larus fuscus*), balearic shearwater (*Puffinus mauretanicus*) and european shag (*Phalacrocorax aristotelis*), all with more than 40 individuals observed.

All sightings with spatial information are represented in the maps below (Figure 2-3 and 2-4).

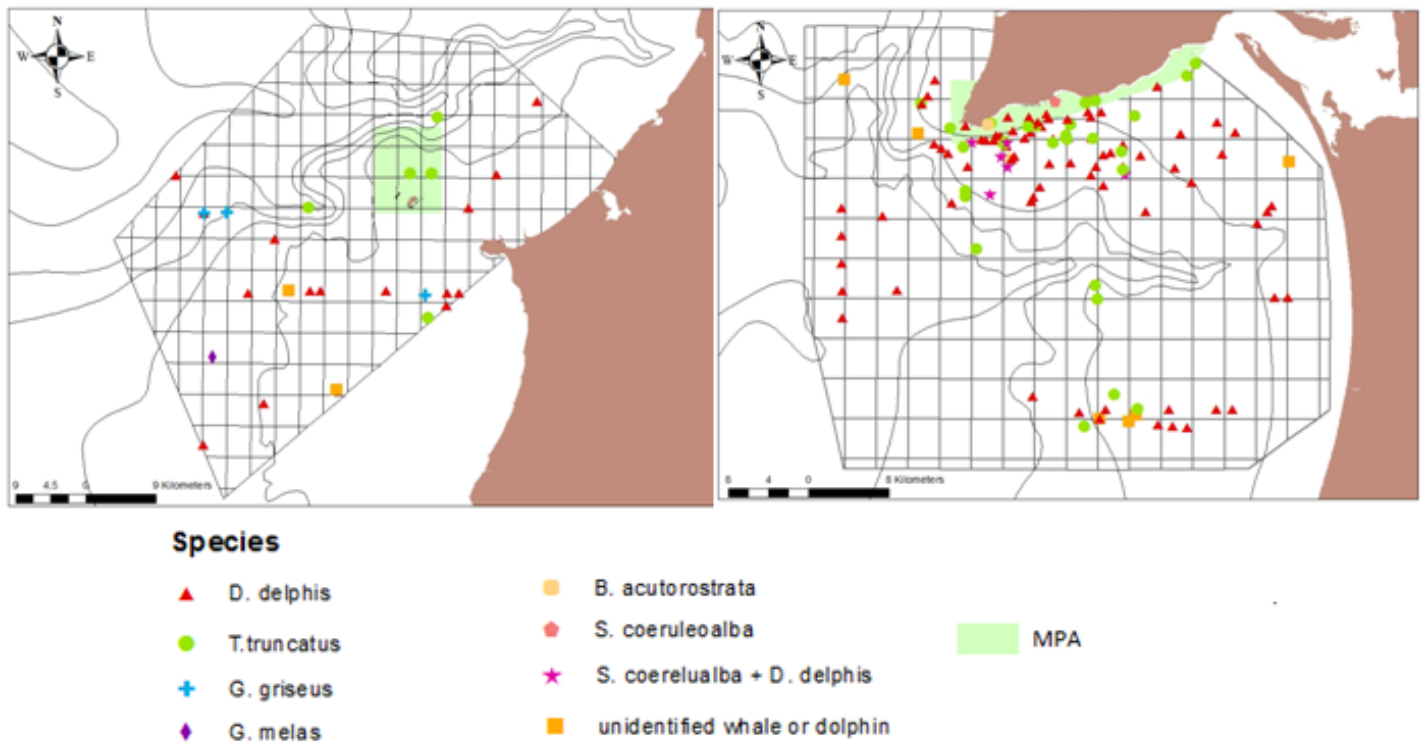


Figure 2-3: Sightings of cetaceans in Peniche (left) and in Sesimbra (right).

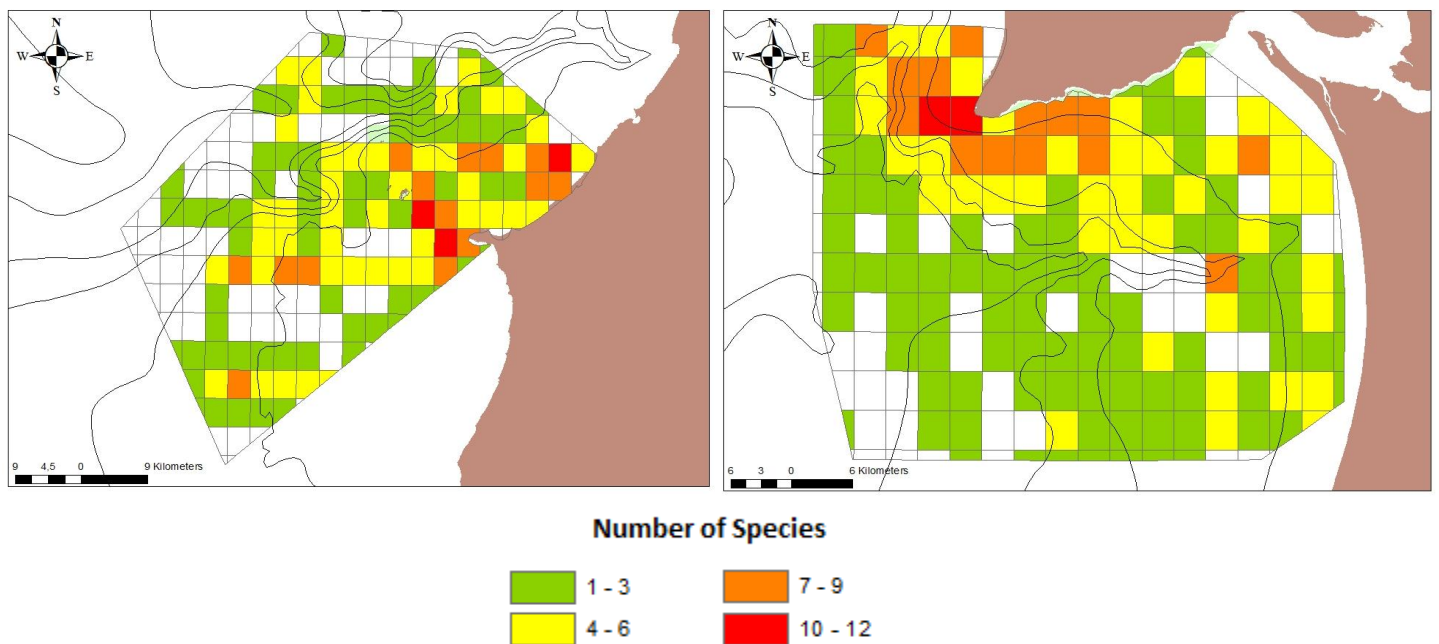


Figure 2-4: Sightings of seabirds in Peniche (left) and in Sesimbra (right).

The two species present in both areas and most abundant, short-beaked common dolphin and common bottlenose dolphin, were distributed in the area differently. Comparing short-beaked common dolphin and common bottlenose dolphin data on distance to shore, distance to the closest port and depth when the sighting occurred, through the Mann-Whitney U test, only the distance to shore was significantly different ( $U=1232, N=131, p<0.05$ ) between the two species (Table 2-3).

Table 2-3: Comparison between short-beaked common dolphin and common bottlenose dolphin related to distance to shore, distance to the main port and bathymetry in the two areas.

Species	Area	Distance to shore (kilometers)		Distance to the main port (kilometers)		Depth (kilometers)	
		Mean	SD	Mean	SD	Mean	SD
Short-beaked common dolphin	Peniche	16.5	9.0	0.4	0.6	23.5	13.2
	Sesimbra	7.6	6.5	0.3	0.4	14.6	10.4
Common bottlenose dolphin	Peniche	7.0	4.0	0.4	0.5	17.5	5.3
	Sesimbra	6.3	7.2	0.2	0.1	11.3	8.6

SD, standard deviation

Short-beaked common dolphin was sighted all year in Sesimbra and in February, April, October and November for Peniche. Common bottlenose dolphin was present from April to February in Sesimbra and March, April and July in Peniche. For the species only detected in Peniche, pilot whale was sighted only once in April and Risso's dolphin had 3 sightings that occur in February ( $N=2$ ) and April ( $N=1$ ). For Sesimbra, striped dolphin was sighted once in August, minke whale had 3 sightings in March, May and September and the mixed groups was sighted in January ( $N=1$ ), September ( $N=2$ ) and October ( $N=3$ ).

Both cetaceans and seabirds had more encounters closer to shore (Figures 2-3 and 2-4).

Regarding seabirds, 15 and 16 species were classified as rare in Peniche and Sesimbra, respectively. A minimum number of 9 species can be seen all year (Table 2-4). Of all species, the northern gannet is the only one that can be seen all year in the two areas.

Table 2-4: Survey effort and sightings of seabirds per season in Peniche and Sesimbra.

Season	Peniche			Sesimbra		
	Number of days	Minutes of survey	Species of seabirds	Number of days	Minutes of survey	Species of seabirds
Winter	8	970	12	8	910	9
Spring	23	3145	17	20	4195	24
Summer	5	520	11	4	670	11
Fall	9	1475	20	17	2520	20

Time to the first cetacean sighting

Table 2-5 summarize the information about the average of trips with sightings, time until the first sighting occur, distance of the first sighting to shore and distance to the closest port. In Sesimbra, cetaceans were found faster and closer than in Peniche, with significant differences among areas in distance to shore ( $U=140$ ,  $N=81$ ,  $p<0.05$ ) and distance to the main port ( $U=217$ ,  $N=81$ ,  $p<0.05$ ).

Table 2-5: Time to firsts sighting, duration of trip, distance to shore, distance to the main port and depth of in the two areas.

Area	Time to first sighting (minutes)		Duration of trip (minutes)		Distance to shore (kilometers)		Distance to the main port (kilometers)		Depth (kilometers)	
	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Peniche	83.0	58.7	184.4	106.6	16.7	9.5	24.4	12.3	0.3	0.4
Sesimbra	77.3	69.0	208.2	91.8	6.4	6.1	12.3	8.6	0.2	0.2

SD, standard deviation

## 2.5 Discussion

In both areas the most common species of cetaceans were short-beaked common dolphin and common bottlenose dolphin. Minke whale was the only whale detected, which is the most threatened of all 6 cetacean species occurring in the study area, with a conservation status of “Vulnerable” in Portugal (Cabral *et al.* 2005). In Sesimbra, there is the possibility that individuals of the resident population of common bottlenose dolphin of Sado estuary may occur in the coastal area of Sesimbra, a population target of an action plan for its safeguarding and monitoring (Sequeira *et al.* 2009). Whale-watching in these areas should take into consideration the presence of this vulnerable species.

It is possible to sight cetaceans all year around but given the weather and sea conditions most probably only the summer season would be feasible, also because during this period there are an increase in the number of tourists (both nationals and from abroad) (Turismo de Portugal 2007). Despite this general belief, Berlengas have sudden changes in the strength of the wind and the sea state which can be restrictive to the activity. With PMLS the situation is different since most of its extension is facing south, allowing a protection against the north and northwest winds implying a low hydrodynamics on that portion. Also, even though an average of 3 hours trip is needed for Peniche and 3 hours and half for Sesimbra the fact that a little more than an hour of average for the first sighting is needed in both areas is consistent with the duration of trips in Portugal (at least 1 hour). Despite this, the sighting rates calculated for our study were relatively low. Vieira *et al.* (2009) calculated cetaceans SPUE values, 0.083 for Peniche and 0.304 for Sesimbra which are comparable to the ones calculated in the present study. For Peniche, the number of sightings were similar but with less effort in our study which justifies a greater SPUE in the present work. In Sesimbra, both the number of sightings and effort had increased proportionally and, consequently, SPUE obtained for the two areas are similar. Comparatively, there are areas with different habitat use by cetaceans like in Aberdeenshire, Scotland, which has a SPUE of 1.67 ( $N=23$ ) (Stockin *et al.* 2006), which is

considerable higher than the SPUE from our study. Places like Gabon (Africa), Wales (United Kingdom), Washington (U.S.A.) and St Vincent and the Grenadines (Central America), with 80% to 100% sighting rate are also growing in the whale-watching industry (O'Connor *et al.* 2009). Both Sesimbra (55%) and Peniche (35%) had a lower sighting rate than most of the regions globally (see Brito *et al.* 2010, O'Connor *et al.* 2009, Stockin *et al.* 2006). Low sighting may not, however, be deterrent of conducting whale-watching. In fact, regions such as São Tomé and Príncipe, Gulf of Guinea, which have smaller SPUE (0.1) are starting a successful and growing whale-watching industry (Brito *et al.* 2010). Benin, Africa, with a sighting rate of 70% has potential to grow but some barriers like capital investment, low awareness of this type of tourism potential and low income of tourists to Benin are preventing it (O'Connor *et al.* 2009).

A possible way to increase the success of whale-watching in regions with low sighting rates is to include observations of other marine animals. RNB is a good place to include seabirds watching since is particularly important as a nesting area because it contains the only colonies of Procellariiformes of mainland Portugal and together with PMLS have species with a threatened conservation status of "Critically Endangered" like common guillemot (*Uria algae*) and balearic shearwater (Cabral *et al.* 2005). In relation to rare species that could attract bird-watchers focused on some of them, in our study area not all of the detected species classified as rare have actually that status. Band-rumped storm petrel (*Oceanodroma castro*) is difficult to detect because of its size and Mediterranean gull (*Larus melanocephalus*) and razorbill (*Alca torda*) are most abundant in a small time period which is coincident with our lesser effort months (December and January) and are also present during the day closer to shore (Catry *et al.* 2010). Because the two areas are relatively close by so the variability in occurrence should be similar and the peak on seabirds occurrence occur in the two migrations, which seems to be the best time to see seabirds (Greenwood 2007, Berthold 2001). Seabirds are sighted more frequently than cetaceans and also had more species sighted closer to shore. There was also the presence of coastal species that breeds on cliffs like *Phalacrocorax* sp. or species that rests in there during the day, like Mediterranean gull (Catry *et al.* 2010). Bird-watchers can be captivated by the opportunity to see several species of seabirds or vagrant birds (mostly during migration seasons) and simultaneously learn about conservation and ecology of cetaceans.

Both areas show potential for marine and ecological tourism but it should be considered if the benefits described from using an MPA as a platform for tourism compensate the impacts that these activity may have on the ecosystem. In order to do so, there is a need to compare MPA with non-MPA. In relation to the possible impact of the activity, critical areas, related to behaviours of feeding, resting and reproduction (Richardson *et al.* 1995) should be created to define areas where the tourist boats should take special care when passing by or in extent of their stay. Some populations of dolphins show behaviour changes in relation to time of day (Cipriano 1992, Barr and Slooten 1999) so further research should be done to measure this variable in populations occurring nearshore. There is also a need to understand the ideal conditions for sighting cetaceans and if a high sighting rate is really an important factor to attract tourists. For instance when tourists were inquired on their satisfaction when cetaceans were not seen on a trip in Moray Firth, 89% was still satisfied (Arnold 1997).

Assessing the ecosystem and populations status can be a good starting point for sustainable development of whale-watching tourism with an investment in scientific knowledge and education especially since there are MPA platforms in the two study areas that can be monitor. Despite the creation of the two MPA were not because of the presence of cetaceans species, they depend on them since they contain nursery habitats important for this top predators. Data presented suggests the interest and potentiality of implementing correct and consistent observation of fauna species and to establish conservation measures. Tourist trips dedicated to cetaceans and seabirds observations gain a higher value either for tourists as well as conservationist issues.

### **2.6 Acknowledgments**

We would like to acknowledge all the ESAS and *Escola de Mar* observers and the rest of SPEA team for data acquisition. This project was carried out through a partnership between *Escola de Mar*, *APCM - Associação para as Ciências do Mar* and *ICNF*, which started in January 2011, and is undertaken under the “Action Plan for the Protection and Monitoring of the Sado Estuary’s Bottlenose dolphins Population” (<http://roazesdosado.icnb.pt>) approved in 2009 and with financial support from the *Troia Natura*.

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## CHAPTER 3: WHALE-WATCHER IN MAINLAND PORTUGAL: CURRENT AND POTENTIAL PROFILE

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Gonçalves, I.T.<sup>1,2</sup>, Sá, E.<sup>2,3</sup>, Castro, J.<sup>4</sup>, Laborde, M.I.<sup>2,4</sup> and Brito, C.<sup>1</sup>

<sup>1</sup>Escola de Mar, Edifício ICAT, Campus da FCUL, Campo Grande, 1749-016 Lisboa, Portugal

<sup>2</sup>Centro de Oceanografia, Faculdade de Ciências, Universidade de Lisboa, Campo Grande, 1749-016 Lisboa, Portugal

<sup>3</sup>AtlanticSafaris, Rua Quinta dos Frades, 904, Alcolgulhe, 2400-821 Leiria, Portugal

<sup>4</sup>AIMM - Associação para a Investigação do Meio Marinho / Marine Environment Research Association, R. Maestro Fred. Freitas Nº15 - 1º, 1500-399, Lisboa, Portugal

### 3.1 Abstract

*When assessing the viability of whale-watching tourism, there is a need to determine the profile of current whale-watchers. To see if there are local and national potential clients for the activity their profile should also be ascertained. In order to do so, for mainland Portugal, between 2011 and 2012, 1129 questionnaires were collected in 6 “sites”. Results show that whale-watchers had between 25-45 years, with a slight female bias, where also foreigners, employed and with university level mainly in areas of education B and C. The main motivation to do whale-watching was to see cetaceans but awareness on issues about these animals was low between whale-watchers. The best trip for potential tourists would be during summer, with 3 hours duration and 12 persons’ boat capacity, with the Portuguese islands of Azores and Madeira as the preferred site. Most of them did not know what would be the minimum sighting rate required and the possibility of negative impact would be an impediment to perform whale-watching. About 90% of respondents know that the activity already exists in Portugal and the majority had done the activity before and would pay more than €35 for it. In opposition, the group that had never done it, who would pay less than that amount. This study gathers information to improve whale-watching tourism in Portugal. Also shows that both seabirds and fishes watching and environmental interpretation on boats are touristic activities with potential to attract tourists.*

**Keywords:** whale-watching, tourism, motivation, awareness, education.

### 3.2 Introduction

Land-based whale-watching began San Diego, California in 1950 with the first public whale-watch lookout and in 1955 the first commercial boat-based operator created (Hoyt 2001). Despite that, whale-watching seen as a financial alternative to whaling take place only after the International Whaling Commission’s (IWC) moratorium on commercial whaling in 1982 (O’Connor *et al.* 2009). In Portugal, this activity started in Azores Islands at the beginning of the 1990s, where land-based lookouts for whaling were re-used by operators to help in finding the

animals through radio warning (Gonçalves and Prieto, 2003). Presently whale and dolphin watching exists in the archipelagos (Azores and Madeira) and in some areas of the mainland, mainly in the south (Algarve coast). In mainland Portugal whale-watching begun in 1998 with a total of 17 licensed companies distributed in Peniche, Nazaré, Setúbal (Sado estuary) and along the south coast in the Algarve with mainly Lagos, Albufeira and Portimão as departure points. The majority of trips cost an average of €33 for an adult and €20 for children (O'Connor *et al.* 2009). Mainly dolphin watching is done in the mainland because larger cetaceans are more difficult to spot and similarly to the Islands, the activity can be combined with other type of nature cruises (O'Connor *et al.* 2009).

Madeira, Azores and Algarve are among the few places in Portuguese territory which conducted studies to characterize the profile of whale-watcher (Oliveira 2005, Ferreira 2007, Claro 2009,). This is necessary in any economic activity with the need to maintain client satisfaction, especially if restrictions on viewing time limits and distances are applied (Andersen and Miller 2006). It is also important to determine the information retained from trips by whale-watchers. The profile of whale-watcher in the Portuguese territory is in general similar to the profile around the world (Tilt 1987, Forestell and Kaufman, 1990, Pearce and Wilson, 1995, Muloin 1996, Warburton *et al.* 2000, Hoyt 2001, Parsons *et al.* 2003, Lück 2003, Ferreira 2007, Claro 2009, Mayes and Richins, 2009, Mustika *et al.* 2012).

The main goal of the present study is to characterize the profile of current tourists and potential tourists who may want to engage in whale-watching. The interest of tourists in conducting seabird-watching and environmental interpretation will also be studied.

### **3.3 Methods**

#### Study area

Sampling was carried out at various points along the Portuguese mainland coast (Figure 3-1).

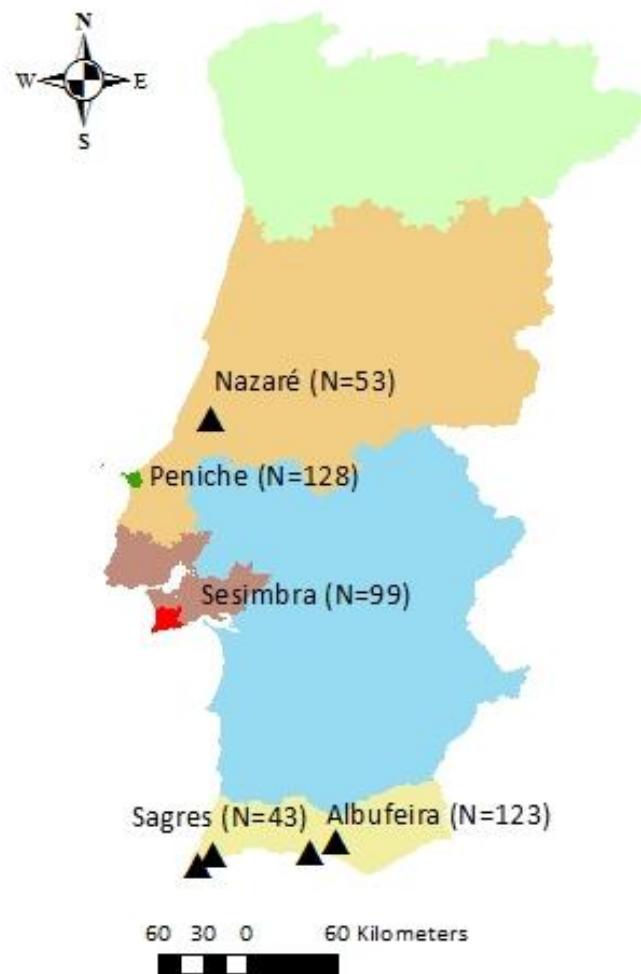


Figure 3-1: Map of mainland Portugal with Peniche and Sesimbra highlighted in green and red, respectively and the location of operators with a triangle symbol.

### Data collection

Data was obtained through the distribution and filling of three types of questionnaires:

- (A) Between August 2011 to September 2012, 219 questionnaires among tourists from whale-watching vessels, from 5 operators, having each trip with a duration between 90 to 120 minutes (Figure 3-1);
- (B) Between July 2011 to August 2012, 227 questionnaires from any person in the village of Sesimbra and the town of Peniche (Figure 3-1); and,
- (C) Between December 2011 to August 2012, 683 online questionnaires with the link posted in the following websites and newsletters: Facebook<sup>1</sup>, Escola de Mar<sup>2</sup>, SPEA<sup>3</sup>, Google+<sup>4</sup>, DivulgaçãoFCUL, etc.

<sup>1</sup> [www.facebook.com](http://www.facebook.com)

<sup>2</sup> [www.escolademar.pt](http://www.escolademar.pt)

<sup>3</sup> [www.spea.pt](http://www.spea.pt)

<sup>4</sup> [plus.google.com](https://plus.google.com)

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The questionnaire A served the purpose of finding the motivation, environmental awareness, information apprehended, satisfaction and socio-demographic information of the current whale-watcher in areas where whale-watching occur in mainland Portugal. It is divided into two parts in order to determine whether there is a difference of opinion after the contact with the animals and if visitors seized information on cetaceans and their ecosystem.

Both B and C questionnaires were used to assess the so-called “potential client”, i.e., people willingness to carry out this tourism and their motivation.

In December 2011, in the three types of questionnaires, there were introduced some questions about the interest in conducting seabird-watching activities.

The questionnaires did not follow a periodic distribution and were anonymous, voluntary and were only given to people over 18 years old. They had a combination of closed and open questions, with the last analyzed according to different categories of classification. The “area of education” was divided in 4 categories (Table 3-1).

Table 3-1: Demographic profile of the sample.

Area of education	Description
A	Architecture, Arts and Humanities
B	Science, Health and Sports
C	Economics, Social Sciences, Law, Services, Management
D	Industrial Engineering, manufacturing and construction, Mathematics and Informatics engineering

Questionnaires A and B were conducted in five languages, according to the native speaking of the main source markets (Turismo de Portugal 2012): Portuguese, Spanish, English, French and German. The questions were based on studies described along chapter 3 and, in addition, some new relevant questions were included to determine new prospects that have not been addressed yet.

The questionnaires were subjected to descriptive analysis and analyzed by the frequency of each response.

### **3.4 Results**

#### Demographic profile

Information on age, gender, nationality, occupation, area and level of education and group composition was collected (Figure 3-2) and differences between sites and targets were found.

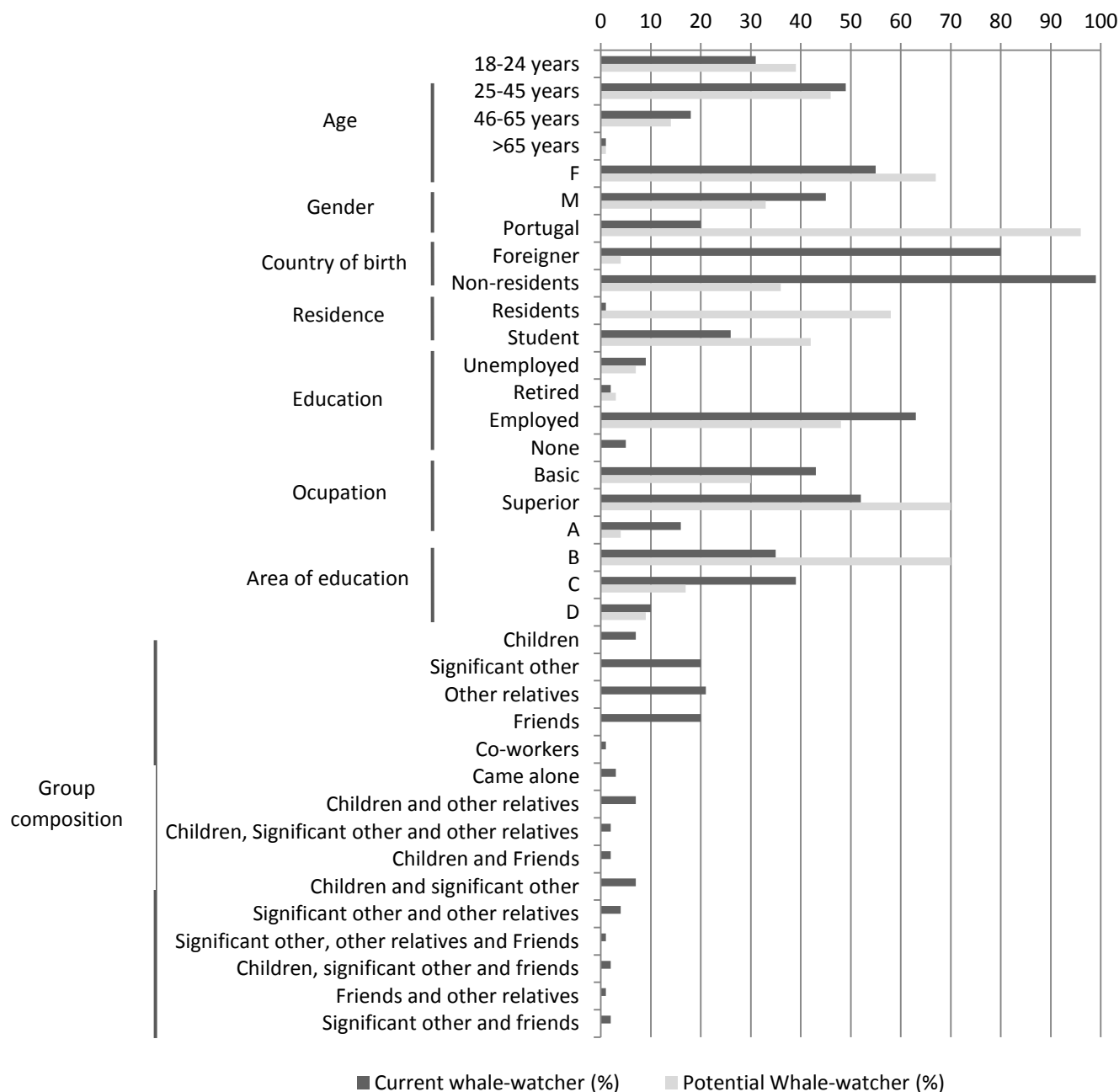


Figure 3-2: Demographic profile of current and potential whale-watcher (N=122).

Both current and potential whale-watcher was mostly between 25-45 years, with a slight female bias.

Current whale-watchers were mainly foreigners, varying their origin (Figure 3-3). In opposition, the majority of potential clients sample were Portuguese, with an average of 96% of the sample from all sites. Inquiries distributed in Peniche, Sesimbra and in enterprise sites (Albufeira, Sagres and Nazaré) had a greater ration of non-residents.

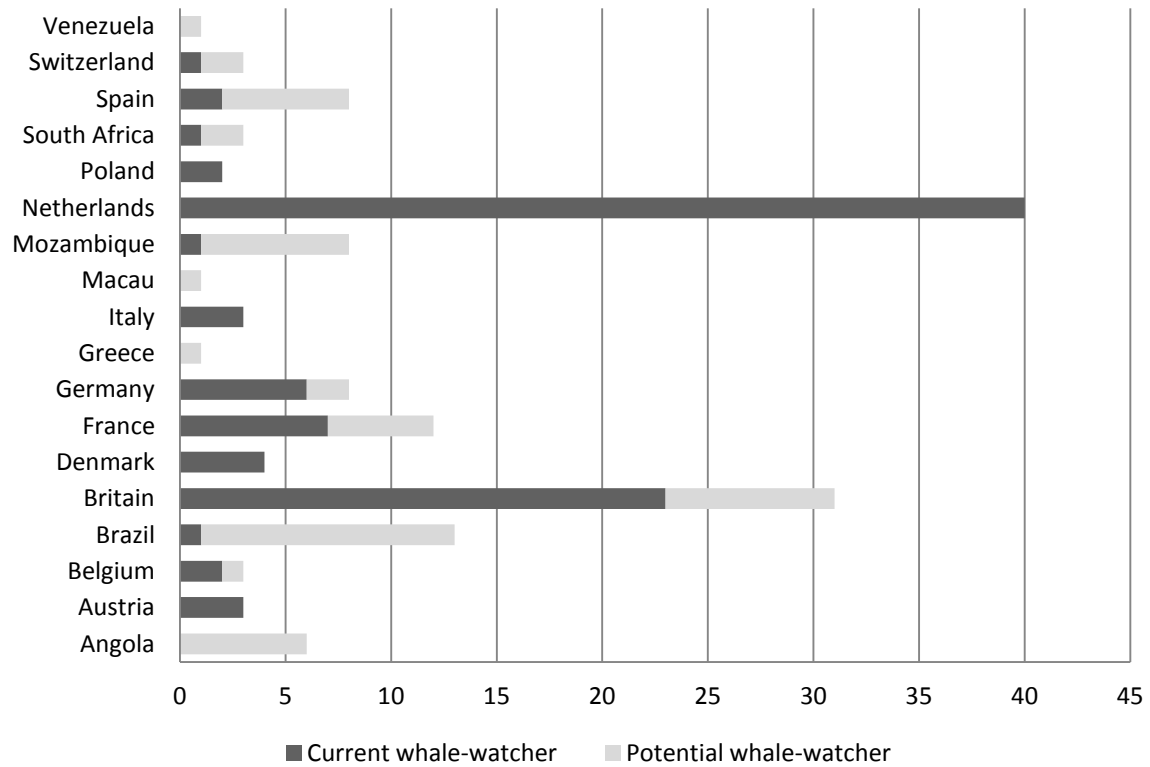


Figure 3-3: Number of foreign respondents from each country (N=122).

A large percentage of all inquiries had a job, except in the online inquiries with 47% being students, opposed to 43% employed.

In relation to education, two parameters were analyzed: level and area of education. Both current and potential whale-watcher had in general university degree. For the second parameter, 4 categories were created (Table 3-1). B and C were the most frequent with A and D with lower numbers of respondents.

The group composition in whale-watching activities was also sampled, where friends and family groups were more popular.

### Whale-watching activity

In order to find the motivation of current and potential whale-watchers to go whale-watching, a range of options adapted from Parsons *et al.* (2003) were provided to respondents (Figure 3-4). It was required to choose 3 primary reasons and so, only questionnaires with this required number of answers were considered. Professional reasons, interest in the marine environment, education value of the activity, to learn and see other animals besides cetaceans and to help in the conservation of cetaceans are among some extra reasons mentioned by respondents.

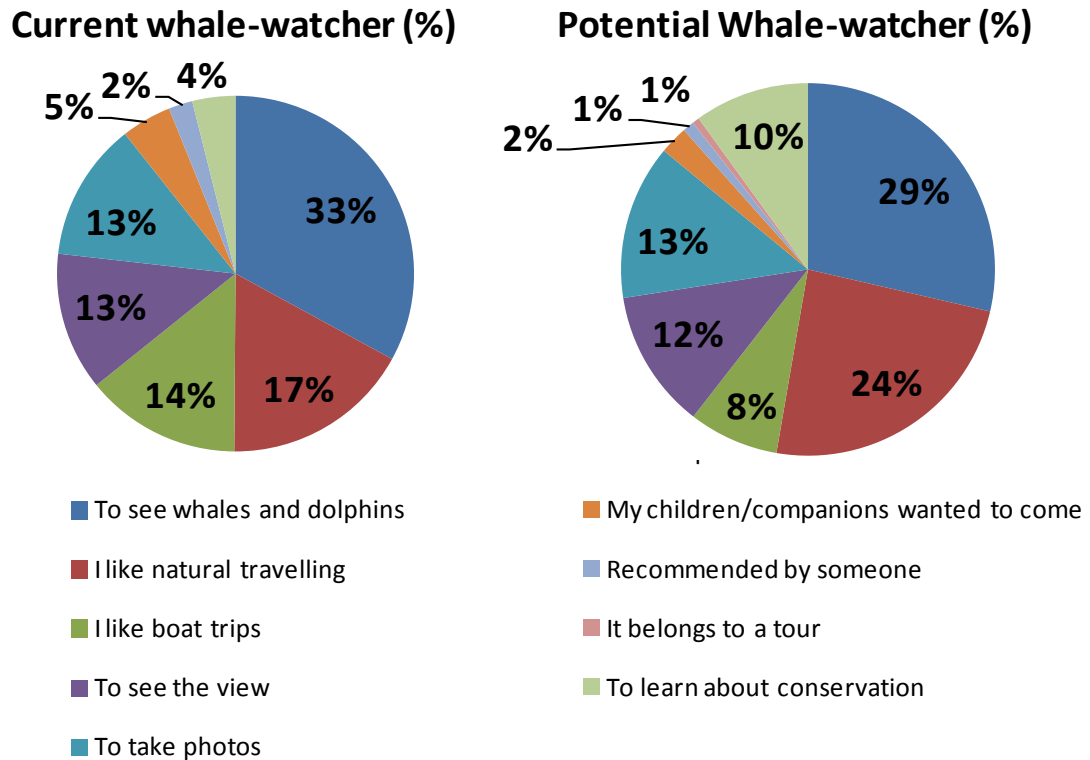


Figure 3-4: Motivation options chosen by current and potential tourists to do whale-watching (N=1447).

Seeing cetaceans was the most common motivation to do whale-watching. Second reason most considered was to do natural travelling, to see the landscape, to take boat trips, to learn about conservation and to take photographs.

In relation to the current activity, whale-watchers were asked a different group of questions in relation to the activity they were doing.

Concerning the change of attitude, there was a reduction of people wanting to stay closer to animals from 92% before the trip to 50%, when asked after the trip.

For choices on what would improve the activity, a list of requests before and after the trip was obtained. Before the beginning of the trip, the desire to see and interact with cetaceans were the most common requests while after the trip most people had nothing to add. Of the negative outcomes, the most common related to the enterprise were conditions on board and the need of more information about the location and the species with some suggesting the presence of biologists on the trips. In relation to the activity, most comments were on the desire to have more interaction with the animals either through diving or by having the boat staying closer and longer. Overall, 70% chose a 5 in the scale for the satisfaction with the activity. Of the 14 respondents that didn't see cetaceans, only 3 chose 4 or 5 in the scale on how the absence of cetacean affected the enjoyment of the trip.

In 1129 surveyed respondents, 424 had been doing whale-watching before (37%). For the groups that already had done the activity and the ones that didn't, there are differences between the prices they would pay for whale-watching. For the first group, most people would

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pay more than €35. Among the second group, potential respondents would pay less than €35 while current whale-watchers would pay more.

Of the respondents who didn't wanted to do whale-watcher, 11 said it was because of the negative impact of the presence of the boats, 6 show no curiosity, 2 have made the activity enough times, 1 didn't like to travel in the sea and another didn't know about the existence of the activity.

For potential whale-watchers, 90% already knew that the activity exists in Portugal. The current whale-watcher usually became aware of the existence when they arrived at the site.

#### Best trip

A number of questions were made in order to evaluate the best way to do the activity, taking into consideration the opinion of potential whale-watchers.

According to results, the best time to do whale-watching trips, in order to attract more tourists is during summer, with trips of 3 hours duration and a boat capacity of 12 persons. Apparently, the most popular place to do whale-watching is on the Portuguese Islands (Azores and Madeira), with 406 respondents choosing that option and with a large number of answers for outside the country or anywhere in the country.

The information required on the trip ranked for: unique features of cetaceans (N=597); conservation of cetaceans in Portugal (N=585); the role of cetaceans in the ecosystem (N=560) and predators and preys of cetaceans (N=464). Other subjects required are: species in Portugal and in the area: occurrence and distribution; feeding and reproductive habits; curiosities; how to help with conservation in Portugal; behaviour; identification of species; scientific methods; information about current studies on cetaceans; tourism impact; probability of encounter; and, seabirds and landscape.

Potential clients were also asked what was the minimum cetacean sighting rate of the enterprise and if, on the other hand, their sighting was not essential (Figure 3-5). Most people didn't know what would be the value required (51%). From the 5 categories created *a posteriori*, (0-20,21-40,41-60,61-80,81-100) and the believe that it is not essential to see cetaceans, most people (17%) demanded between a minimum sighting rate of 61-80% with only 11% saying that sighting is not essential. From 68 respondents who choose between 81-100%, 13 demanded a sighting rate of 100%.



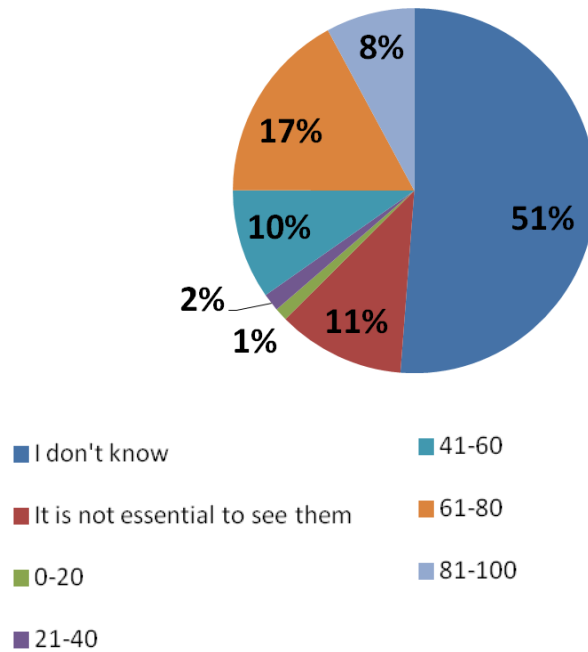


Figure 3-5: Minimum cetacean sighting rate of the enterprise required by potential whale-watchers (N=697).

### Conservation issues

Questions on the knowledge of the potential impact of whale-watching and another conservation issues were made.

Most current whale-watchers changed from low scale idea of the impact of whale-watching on animals, to higher values (Table 3-2). Also, 71% of potential whale-watcher would consider that the negative impact that this activity could have on the animals would be an impediment to perform whale-watching activity.

Table 3-2: Number of respondents for the question “In a scale of 1 to 5, how would you rate the (negative) impact of this activity on the animals?” in the two parts of questionnaires for whale-watchers.

Scale	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
Part 1					
N	42	64	68	23	6
%	<b>22</b>	<b>31</b>	<b>33</b>	<b>11</b>	<b>3</b>
Part 2					
N	31	55	57	21	27
%	<b>16</b>	<b>29</b>	<b>30</b>	<b>11</b>	<b>14</b>

Current whale-watchers were tested on their knowledge about what species they have seen. The majority of people knew that cetaceans are marine mammals, while 15% for dolphins and 18% for whales, said that they were fish, sharks, marsupial, invertebrates or didn't know how to answer. After finishing the trip, 8% for both dolphins and whale, still didn't know the correct answer. On a worse perspective, before beginning the activity, 82% of

respondents couldn't specify what species they could see. After the trip, the majority still couldn't say which species they have saw. Respondents were also question about the threats to cetaceans known by them, with pollution, oil spill, noise, presence of boats, hunting and fishing as the main answers. In relation to measures that can be applied to mitigate this threats, besides correct management of the ones said above, the creation of protected areas and environmental education were presented as possible solutions. As individuals, the majority of respondents point out financial and other types of support to environmental organizations and stop the dumping trash on the sea.

#### Potential to pelagic trips and environmental interpretation

Boat based seabirds watching and environmental interpretation are both activities that can be used to improve the quality of whale-watching trips.

First, it was asked if current tourists were willing to see other animals besides cetaceans and which ones. This result in 87% of respondents answering positively and the most popular groups chosen were fishes and birds. Other animals mentioned are included on groups of algae, cnidaria, mollusca, pinnipedia and reptiles (sea turtles essentially). Besides these groups, 22% said that anything would be good.

Potential whale-watchers were asked if they would like to complement whale-watching with the observation of seabirds and if they would be willing to pay more for that complement. Only 2% wouldn't want to see other animals, mainly because they were only interest in viewing cetaceans. From the 26% that would pay more, prices would range from €2 to €100. For the people who didn't want to pay more do the activity (33%), there is a wide range of reasons to that, with 52% saying that equal effort and cost to operators do not justify it. Other reasons mentioned were related to the view of seabird watching as compensation when cetaceans were not spotted, low financial availability, the two activities together would disturb the level of attention or because they were not interested in seabirds.

Environment education has as target the demonstration of natural phenomena or relations through practical experience, directed to the general public (Tilden, 1957, Ham, 1992). Since there are major education component in activities such as environmental interpretation, the motivation to do so was also assessed. According to the results, 60% of both current and potential whale-watchers would enjoy taking this activity.

### **3.5 Discussion**

#### Demographic profile

Regarding the current whale-watcher, their profile has been studied previously around the world showing that they are well educated (with university degree), affluent, middle-aged (20-60) and the activity have slightly more females (Tilt 1987, Forestell and Kaufman 1990, Pearce and Wilson 1995, Muloin 1996, Warburton *et al.* 2000, Hoyt 2001, Lück 2003, Parsons *et al.* 2003, Oliveira 2005, Ferreira 2007, Claro 2009, Mayes and Richins 2009, Mustika *et al.* 2012). A minimum percentage of people do the activity due to children desire but most travel without

them. Still, compared to the average tourist, this activity attracts more people with children than in general (Parsons *et al.* 2003). The results of our study match this general profile.

Usually in the studies mentioned previously, the largest share of tourists are domestic but for Portuguese studies (Oliveira 2005, Ferreira 2007, Claro 2009), including the present one, the majority of tourists came from European countries. Despite that, there are a great number of Portuguese potential clients who wish to do the activity in Portugal, reinforcing the idea that whale-watching has potential to attract more domestic market than currently does.

There is the risk that the national whale-watcher profile is not being correctly assessed, since the survey was primarily done in the Algarve zone. However, the similarities of the three Portuguese studies cited leads us to believe that the differences between national sites may not be significant.

The potential whale-watcher questionnaires show a wide profile that would want to do whale-watching. Despite that, some people did not want to do or repeat the activity which demonstrates the need of the operators to take other steps if they want to expand the profile of tourists attracted to the activity. The first one is to publicize more efficiently their activity, avoiding the lack of awareness of the whale-watching tourism existence. The second step would be to improve the activity in relation to the impact of boats on the animals and the ecosystem by obeying the codes of conduct hence allowing people with environmental concerns to experience whale-watching.

#### Whale-watching activity

Parsons *et al.* (2003) show landscape, seascape and wildlife as main reasons for doing the trip and also the choice of a remoteness area as a key factor for “hardcore” whale-watchers, unlike general tourists who need infrastructure to facilitate access to sites. The fact that the majority wanted to see cetaceans gives operators a marketing advantage since that is something that they can offer (Cabral *et al.* 2005, chapter two).

Orams (2000) show that proximity to the animals had little influence in the satisfaction of tourists on the trip. Our study, like Ferreira (2007), do not reflect that and a high number of tourists wanted to stay longer and closer to the animals.

High levels of satisfaction were obtained in the trips in our study, even from the tourists that didn't see cetaceans, like in Arnold (1997) who show 89% of passengers, who failed to see dolphins, in Moray Firth said that they enjoyed the trip anyway. What led to such high levels of satisfaction in Mayes and Richins study (2009) were the rules and practices of observations (89%), health of the dolphins (87%) and observation of natural behavior (87%) with the number of present vessels (47%) as the feature with the lowest ranking. In our study, like in the study of Orams (2000), the observation of cetaceans seem to be the most important requirement resulting in 43% of the respondents saying after the trip that nothing was needed to improve the activity.

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In our study, similarly to others (Parsons *et al.* 2003, Oliveira 2005, Claro 2009) the majority of tourists was doing the activity for the first time. In Parsons *et al.* (2003), whale-watchers usually became aware of whale-watching only when they arrive at the region. In our case, most of the tourists know that the activity exist in Portugal. The fact that 13% of respondents would like to do the activity in the center of Portugal, reinforce the need to publicize the activity among the domestic and foreign tourists.

Mainland Portugal prices are usually below €35 but we wanted to see if it would be possible to have tourists who would pay more, since achieving the best practices would require extra costs that would probably increase the ticket price. It was expected that people who already had done the activity would be willing to pay more than the ones who did not because they are more familiar with the prices practice around the world, who are usually greater than the Portuguese ones (O'Connor, 2009). Our study show that the last was true but that potential clients would like to pay less than €35, opinion that, according to results with current whale-watchers, can change after doing the activity.

#### Best trip

Mayes and Richins (2009) conducted a study of demographics and motivation of whale-watcher in two types of boats, one with a capacity of 300 passengers and another with 40. Tourists from the smaller boat were more interested in environmental information offered on the trip while on the other vessel the concern was about the possibility of not being capable of seeing dolphins. Our study show that potential whale-watchers would prefer to use smaller boats and had worries about conservation issues.

The majority of potential clients asked for a sighting rate between 60-80%. This may reinforce the idea that trips are not used exclusively for sightings cetaceans, which gives space for other type of activities and attenuates the problem of a low sighting rate on the area (chapter two).

#### Conservation issues

Whale-watching is a vector of environmental education that enables the development of knowledge about different species and threats they face, environmental issues and sometimes even local culture (Warburton *et al.* 2000). A whale-watcher is usually more aware of these matters because of its links with environment as members or volunteers of organizations or involvement in wildlife-related activities (Warburton *et al.* 2000, Parsons *et al.* 2003).

In relation to the impact of the activity in the animals, Ferreira (2007) and Claro (2009) show that only a very small number of respondents revealed a concern on that matter, despite the majority having done the activity before. Our study shows a greater concern from potential whale-watcher, with the possibility of a negative impact on the animals imposing an impediment to perform whale-watching. Also, most current whale-watchers only became aware of the possible impacts during the trip. The existence of a large number of people refusing to do whale-watching in case of a negative impact on animals, lead operators to the need of development of a more sustainable type of tourism and consequently, preventing an

uncontrolled growth that could be harmful on the resources upon which operators relies: cetaceans and other marine wildlife species.

Parsons *et al.* (2003) show that most of whale-watchers know about the occurrence of cetaceans in west Scotland and could even name at least one species. Our study shows a different scenario, with about 82% of respondents unable to name the species they expected to see. The small percentage of improvement in answers between part 1 and 2 of the questionnaire and a large number of people who didn't know the correct answers, lead us to believe that there is a need to improve educational factor on trips maybe by adding the presence of a specialized guide to the tours.

#### Potential to pelagic trips and environmental interpretation

Chapter two show that seabirds-watching as a complementary activity to whale-watching has potential to grown, considering the diversity and importance of seabirds species present in the two MPA (Peniche and Sesimbra).

There are a variety of profiles for birdwatchers but in general they have more than 45 years, high level of education and with a higher income than the general public (Connell 2009, Roig 2008). For Algarve bird watcher, most tourists came from Europe, specially United Kingdom and Germany (Machado 2011), 2 of the 5 source markets of Portugal (Turismo de Portugal 2012). Bird-watchers has as primary goal sighting birds but are also interest in outdoor experience, nature conservation, socialize, enjoy of nature travel, etc (Machado 2011).

Also, wildlife watching tourism comprise other target species besides birds and cetaceans. Taking the interest shown by respondents in the observation of fish, this may be a growing market, especially for sharks and other large pelagic fish. The most common watching activities involving sharks are related with diving, snorkel, underwater viewing and feeding (Newsome *et al.* 2004).

This alternative watching activities, together with whale-watching and an effective interpretation programme may support a sustainable transformation of nature-based tourism into ecotourism (Orams 1996).

### **3.6 Acknowledgments**

We would like to acknowledge all operators (Mar Ilimitado, Atlantic Safaris, Dream Wave, Dolphins Driven and Cape Cruiser), *Escola de Mar* and AIMM team, volunteers, friends and families for data acquisition.

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## CHAPTER 4: FINAL REMARKS

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### 4.1 Main findings

Results of the present study show a low sighting rate of cetaceans in comparison to other countries but there is still a need to understand which factors determine the occurrence of individuals in order to improve sighting rates. At the same time, there are several species occurring in the two areas, which is a bonus for the success of the activity.

On the other hand, maybe the success of the activity does not depend on cetaceans sightings alone. Arnold (1997) show that within passengers who did not see dolphins on Moray Firth boat trips, 89% said that it did not spoil the enjoyment of the trip. Factors such as trip comfort, learning opportunities, quality of the tour, other wildlife encountered other passenger's presence, environment and scenery added value (Woods-Ballard *et al.* 2003, Duffus 1988). In this study, results show that very few people require a 100% sighting rate and that other activities proposed have a potential market and can possibly assure an advantage over dedicated operators. At the same time, it may ensure a much more complete understanding of the ecosystem.

Trips with complementary activities to whale-watching are spread worldwide. In Portugal, most of the observation of these species is opportunistic with only a few operators engaging in dedicated trips. For seabirds, most activities are land-based but boat trips are growing in both the Islands and the mainland. The benefits of this tourism are similar to whale-watching, with the adding advantage of opening a broader profile of the tourists.

Potential tourist, whale-watcher and bird-watcher profiles show a lot of similarities, indicating the viability of engaging in trips with observation of cetaceans and seabirds. Even environmental interpretation show possibility of future development.

Environmental education needs improvement in Portuguese whale-watching, according to the results of chapter 3. Complementary activities can add value to trips and require guides dedicated to these matters, different from what is done in most of the countries.

### 4.2 Methodological considerations

The main limitation on chapter 2 was that the distribution of survey effort in the three approaches has not been consistent between different years. Since the aim of this chapter was to assess the occurrence of cetacean and seabirds species, the results from the three methods were joined. This had some biases related to large number of different observers and survey platforms. Larger vessels would improve visibility (high platform) while smaller boats would give more detail vision of seabirds because observers can be closer to water. Also, the use of both areas by fishing vessels can attract seabirds, reflecting an increase in sightings occurrence. Environmental conditions may limit the detection or presence of some species as their morphology or behavior (Pollock *et al.* 2000). These biases were not corrected for this

paper. Further surveys should be made to equalize the effort among months and within the study area to have a better understanding of the distribution of animals.

The 3 types of questionnaires in chapter 3 methodology present different limitations. Whale-watchers questionnaires were distributed for a short period during summer season and with unbalance sample dimension from different sites, focused mainly in Algarve region, with only one operator from another region (Nazaré). For potential “online” questionnaires, the problem with the demographic sample is the most obvious limitation, with great responses from a younger public, still studying and without strong economic power. At last, the number of foreigner tourists sampled, using the two study areas of the thesis (Sesimbra and Peniche), were insufficient compared to the domestic share.

### **4.3 Future research**

The main subjects, directed related to this thesis project, that should be assessed next would be economic value associated to whale watching and also the impact of the boats on the animals. Without these two parameters, it is not possible to begin a sustainable and planned activity in the future.

National codes of conduct for whale-watching should also be revised to assure that they are effective and also monitor their fulfillment. Portugal regulations are related to noise, level of proximity, number of boats, velocity of the boat, duration of the “close” observation, interference on the group cohesion, feeding of the animals and pollution of the water, with some variations between regulations like the minimum for considering active approach distance (300 m for mainland and 500 m in Azores). In Azores exist also regulation for swimming with dolphins in the nature (forbidden in mainland Portugal) and particular rules with observation of whales.

Other types of nature-based tourism like land-based observation, snorkelling and diving and also other target marine species should also be target of the same effort mentioned for whale-watching in this project and future work recommended.

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## APPENDIX

### A. Number of individuals (cetaceans and seabirds) monthly occurrence in the two study areas

- Peniche

Portuguese common name	English common name	Scientific name	Family	J	F	M	A	M	J	J	A	S	O	N	D	Total
Alma-negra	Bulwer's Petrel	<i>Bulweria bulwerii</i>	Procelariidae	0	0	0	0	0	0	0	0		0	1		1
Cagarra	Cory's Shearwater	<i>Calonectris diomedea</i>	Procelariidae	0	1	206	625	1	34	718	86		20	28		1719
Pardela-de-barrete	Great Shearwater	<i>Puffinus gravis</i>	Procelariidae	0	0	0	1	0	0	0	0		0	5		6
Pardela-preta	Sooty Shearwater	<i>Puffinus griseus</i>	Procelariidae	0	0	1	0	0	0	0	0		2	4		7
Fura-bucho do Atlântico	Manx Shearwater	<i>Puffinus puffinus</i>	Procelariidae	0	0	1	5	0	0	0	2		1	1		10
Pardela-balear	Balearic Shearwater	<i>Puffinus mauretanicus</i>	Procelariidae	1	22	6	57	0	7	19	0		15	82		209
Pardelas	Unidentified Shearwaters	<i>Puffinus sp.</i>	Procelariidae	0	1	0	22	0	0	0	0		0	1		24
Pintainho	Little Shearwater	<i>Puffinus assimilis</i>	Procelariidae	0	0	0	97	0	0	0	0		0	0		97
Alma-de-mestre	European Storm Petrel	<i>Hydrobates pelagicus</i>	Procelariidae	0	0	0	0	0	4	0	0		0	10		14
Painho não identificado	Unidentified Petrel	<i>H. pelagicus/ Oceanodroma sp./ O. oenitrus</i>	Procelariidae	0	0	0	0	0	1	0	0		7	0		8
Roquinho	Madeiran Storm Petrel	<i>Oceanodroma castro</i>	Procelariidae	0	0	0	0	0	2	0	0		0	0		2
Alcatraz	Northern Gannet	<i>Morus bassanus</i>	Silidae	3	593	121	668	8	1	12	32		834	1153		3425
Corvo-marinho	Great Cormorant	<i>Phalacrocorax carbo</i>	Phalacrocoracidae	0	0	20	1	0	0	0	0		0	0		21
Galheta	European Shag	<i>Phalacrocorax aristotelis</i>	Phalacrocoracidae	7	1	14	5	3	4	99	0		0	50		183
Negrola	Common Scoter	<i>Melanitta nigra</i>	Anatidae	0	0	15	48	0	0	0	0		27	0		90
Maçarico-galego	Whimbrel	<i>Numenius phaeopus</i>	Scolopaciidae	0	0	0	11	0	0	28	0		0	0		39
Falaropo-de-bico-grosso	Red Phalarope	<i>Phalaropus fulicarius</i>	Scolopaciidae	0	0	0	0	0	0	0	0		1	0		1
Moleiro do Arctico	Pomarine Skua	<i>Stercorarius pomarinus</i>	Stercorariidae	0	0	0	0	0	0	0	0		0	1		1
Moleiro-pequeno	Artic Skua	<i>Stercorarius parasiticus</i>	Stercorariidae	0	0	2	2	0	0	0	0		1	0		5
Alcaide	Great Skua	<i>Stercorarius skua</i>	Stercorariidae	0	13	13	40	0	0	2	4		19	19		110

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Moleiros	Unidentified Skua	<i>Stercorarius sp.</i>	Stercorariidae	0	0	1	0	0	0	0	0	1	0	2
Gaivota-de-cabeça-preta	Mediterranean Gull	<i>Larus melanocephalus</i>	Laridae	0	0	0	0	0	0	0	0	1	3	4
Guincho	Black-headed Gull	<i>Larus ridibundus</i>	Laridae	1	1	0	0	0	0	0	0	0	0	2
Gaivota-d'asa-escura	Lesser Black-backed Gull	<i>Larus fuscus</i>	Laridae	0	11	2	38	0	0	0	0	0	35	86
Gaivota-de-patas-amarelas	Yellow-legged Gull	<i>Larus michahellis</i>	Laridae	239	84	56	373	9	505	382	0	3	646	2297
Gaivotão-real	Great Black-backed Gull	<i>Larus marinus</i>	Laridae	0	0	1	0	0	0	0	0	0	0	1
	Unidentified Gull	<i>Larus sp.</i>	Laridae	0	16	2	352	0	0	0	0	0	1131	1501
Gaivota-d'asa-escura ou Gaivota-de-patas-amarelas	Lesser Black-backed Gull/ Yellow-legged Gull	<i>Larus fuscus/ L. michahellis</i>	Laridae	0	67	143	281	0	0	0	0	20	232	743
Gaivota-tridactyla	Black-legged Kittiwake	<i>Rissa tridactyla</i>	Laridae	0	1	0	0	0	0	0	0	0	0	1
Garajau	Sandwich Tern	<i>Sterna sandvicensis</i>	Sternidae	0	0	0	42	0	0	0	0	1	0	43
Gaivina	Common Tern	<i>Sterna hirundo</i>	Sternidae	0	0	0	40	0	0	0	7	0	0	47
Gaivina	Unidentified Tern	<i>Sterna sp.</i>	Sternidae	0	0	0	1	0	0	0	6	0	0	7
Airo	Common Guillemot	<i>Uria aalge</i>	Alcidae	1	3	0	0	0	0	0	0	0	0	4
Torda mergulheira/ Airo	Razorbill/ Common Guillemot	<i>Alca torda / Uria aalge</i>	Alcidae	0	0	0	0	0	0	0	0	0	0	0
Torda mergulheira	Razorbill	<i>Alca torda</i>	Alcidae	19	23	17	0	0	0	0	0	0	7	66
Papagaio-do-mar	Atlantic Puffin	<i>Fratercula arctica</i>	Alcidae	0	2	0	0	0	0	0	0	0	1	3
	unidentified auk		Alcidae	0	3	0	0	0	0	0	0	0	0	3
Pombo-das-rochas	Rock Dove	<i>Columbia livia</i>	Columbidae	0	0	0	2	0	0	0	0	0	0	2
Coruja-do-nabal	Short-eared Owl	<i>Asio flammeus</i>	Strigidae	0	0	0	0	0	0	0	0	1	0	1
Andorinhão-preto	Little Swift	<i>Apus affinis</i>	Apodidae	0	0	0	0	1	0	0	0	0	0	1
Andorinha-das-chamines	Barn Swallow	<i>Hirundo rustica</i>	Hirundinidae	0	0	0	1	0	0	0	0	0	0	1
Andorinha-dos-beirais	Common House Martin	<i>Delichon urbicum</i>	Hirundinidae	0	1	0	0	0	0	0	0	0	0	1
Alvéola-citrina	Grey Wagtail	<i>Motacilla citreola</i>	Motacillidae	0	0	0	0	0	0	0	0	1	0	1
Alvéola-branca	White Wagtail	<i>Motacilla alba</i>	Motacillidae	0	0	0	0	0	0	0	0	0	0	0
Ave não identificada	unidentified bird	-	-	0	0	0	0	0	0	0	0	0	1	1



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Baleia ou golfinho	whale or dolphin		-	0	1	0	0	0	0	0	0	0	0	1
Baleia-piloto	Long-finned pilot whale	<i>Globicephala melas</i>	Delphinidae	0	0	0	2	0	0	0	0	0	0	2
Golfinho	unidentified dolphin		-	0	0	0	0	0	0	0	0	1	0	1
Roaz	Common bottlenose dolphin	<i>Tursiops truncatus</i>	Delphinidae	0	0	1	32	0	0	4	0	0	0	37
Golfinho-comum	Short-beaked common dolphin	<i>Delphinus delphis</i>	Delphinidae	0	26	0	26	0	0	0	0	36	99	187
Grampo	Risso's dolphin	<i>Grampus griseus</i>	Delphinidae	0	26	0	2	0	0	0	0	0	0	28

• Sesimbra

Portuguese common name	English common name	Scientific name	Family	J	F	M	A	M	J	J	A	S	O	N	D	Total
Cagarraz	Black-necked Grebe	<i>Podiceps nigricollis</i>	Podicipedidae	0	0	0	0	0		0	2	0	0	0		2
Alma-negra	Bulwer's Petrel	<i>Bulweria bulwerii</i>	Procelariidae	0	0	0	1	0		0	0	0	0	0		1
Cagarra	Cory's Shearwater	<i>Calonectris diomedea</i>	Procellariidae	1	1	0	8	3		96	55	8	344	33		549
Pardela-de-barrete	Great Shearwater	<i>Puffinus gravis</i>	Procellariidae	0	0	0	0	0		0	1	1	0	0		2
Pardela-preta	Sooty Shearwater	<i>Puffinus griseus</i>	Procellariidae	0	0	0	4	0		0	0	0	0	0		4
Fura-bucho do Atlântico	Manx Shearwater	<i>Puffinus puffinus</i>	Procellariidae	0	0	0	0	2		0	0	0	0	0		2
Pardela-balear	Balearic Shearwater	<i>Puffinus mauretanicus</i>	Procellariidae	3	1	0	9	4		15	2	1	91	40		166
Pardela não identificada	unidentified shearwater	<i>Puffinus sp.</i>	Procellariidae	0	0	0	0	0		0	0	1	0	0		1
Casquilho	Wilson's Storm-petrel	<i>Oceanites oceanicus</i>	Hydrobatidae	0	0	0	0	0		0	1	29	0	0		30
Alma-de-mestre	European Storm Petrel	<i>Hydrobates pelagicus</i>	Hydrobatidae	0	0	0	0	5		0	0	3	2	0		10
Painho não identificado	Unidentified Petrel	<i>leucorhoa/H. pelagicus/O. castro</i>	Hydrobatidae	0	0	0	1	0		0	5	1	4	0		11
Roquinho	Madeiran Storm Petrel	<i>Oceanodroma castro</i>	Hydrobatidae	0	0	0	1	0		0	2	0	0	0		3
Alcatraz	Northern Gannet	<i>Morus bassanus</i>	Sulidae	275	393	189	850	110		11	144	109	1298	489		3868
Corvo-marinho	Great Cormorant	<i>Phalacrocorax carbo</i>	Phalacrocoracidae	0	0	0	0	0		0	0	0	0	1		1
Galheta	European Shag	<i>Phalacrocorax</i>	Phalacrocoracidae	3	0	0	6	2		0	0	0	3	29		43

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*aristotelis*

Negrola	Common Scoter	<i>Melanitta nigra</i>	Anatidae	8	0	299	18	0	0	0	0	0	583	908
Seixoeira	Red Knot	<i>Calidris canutus</i>	Scolopacidae	0	0	0	1	0	0	0	0	0	0	1
Pilrito-das-praias	Sanderling	<i>Calidris alba</i>	Scolopacidae	0	0	0	0	6	0	0	0	0	0	6
Maçarico não identificado	Calidrids	<i>Calidris sp.</i>	Scolopacidae	0	0	0	33	1	0	0	0	0	0	34
Maçarico-galego	Whimbrel	<i>Numenius phaeopus</i>	Scolopacidae	0	0	0	176	0	0	0	0	0	0	176
Rola-do-mar	Ruddy Turnstone	<i>Arenaria interpres</i>	Scolopacidae	0	0	0	1	0	0	0	0	0	0	1
Moleiro do Ártico	Pomarine Skua	<i>Stercorarius pomarinus</i>	Stercorariidae	0	0	0	3	0	0	0	0	1	1	5
Moleiro-pequeno	Parasitic Jaeger	<i>Stercorarius parasiticus</i>	Stercorariidae	0	0	0	4	0	0	0	0	2	0	6
Alcaide	Great Skua	<i>Stercorarius skua</i>	Stercorariidae	10	22	0	25	2	1	1	2	81	95	239
Moleiro não identificado	unidentified skua	<i>Stercorarius sp.</i>	Stercorariidae	0	0	0	3	0	0	0	0	0	0	3
Gaivota-de-cabeça-preta	Mediterranean Gull	<i>Larus melanocephalus</i>	Laridae	2	0	0	0	0	0	0	0	0	7	9
Gaivota de Sabine	Sabine's Gull	<i>Larus sabini</i>	Laridae	0	0	0	0	0	0	0	1	0	0	1
Gaivota-d'asa-escura	Lesser Black-backed Gull	<i>Larus fuscus</i>	Laridae	0	0	2	210	5	2	12	0	0	5	236
Gaivota-de-patas-amarelas	Yellow-legged Gull	<i>Larus michahellis</i>	Laridae	3	9	89	658	1979	5	4	1	0	11	2759
Gaivota não identificada	Unidentified Gull	<i>Larus sp.</i>	Laridae	9	1	68	225	5	0	1	180	0	0	489
Gaivota-d'asa-escura ou Gaivota-de-patas-amarelas	Lesser Black-backed Gull/ Yellow-legged Gull	<i>Larus fuscus/ Larus michahellis</i>	Laridae	7	0	0	126	60	5	50	16	0	26	290
Garajau	Sandwich Tern	<i>Sterna sandvicensis</i>	Laridae	0	0	0	57	2	0	2	1	1	0	63
Gaivina	Common Tern	<i>Sterna hirundo</i>	Laridae	0	0	0	4	0	0	2	1	1	0	8
Gaivina/Gaivina do Ártico	Common/Arctic tern	<i>S. hirundo / S. paradisaea</i>	Laridae	0	0	0	0	1	1	0	0	0	0	2
Chilreta	Little Tern	<i>Sterna albifrons</i>	Laridae	0	0	0	5	0	0	0	0	0	0	5
Gaivina	Unidentified Tern	<i>Sterna sp.</i>	Laridae	0	0	0	2	0	0	0	0	1	0	3
Airo	Common Guillemot	<i>Uria aalge</i>	Alcidae	0	0	0	1	0	0	0	0	0	1	2
Torda mergulheira	Razorbill	<i>Alca torda</i>	Alcidae	1	8	0	1	0	0	0	0	0	1	11
Pombo-das-rochas	Rock Pigeon	<i>Columba livia</i>	Columbidae	0	0	0	1	0	0	0	0	0	0	1

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Rola-turca	Eurasian Collared Dove	<i>Streptopelia decaocto</i>	Columbidae	0	0	0	1	0		0	0	0	0	0		1
Ave não identificada	Unidentified bird			0	0	0	1	0		0	0	0	0	0		1
Passeriforme não identificado	Unidentified passerine			0	0	0	0	0		0	0	0	0	6		6
Grande baleia	large whale			0	0	0	0	0		0	1	0	0	0		1
Golfinho não identificado	Unidentified dolphin			0	0	0	8	0		3	0	0	9	0		20
Roaz	Common bottlenosed dolphin	<i>Tursiops truncatus</i>	Delphinidae	20	83	0	25	21	6	67	110	71	89	32	35	559
Golfinho-comum	Short-beaked common dolphin	<i>Delphinus delphis</i>	Delphinidae	95	8	85	152	23	71	236	107	96	222	205	21	1321
Golfinho-riscado	Striped dolphin	<i>Stenella coeruleoalba</i>	Delphinidae	0	0	0	0	0	0	0	10	0	0	0	0	10
Baleia-anã	Minke whale	<i>Balaenoptera acutorostrata</i>	Balaenopteridae	0	0	1	0	1	0	0	0	1	0	0	0	3
Grupo misto de golfinho-comum e golfinho-riscado	Mixed group of short-beaked common dolphin and striped dolphin	<i>Delphinus delphis</i> + <i>Stenella coeruleoalba</i>	Delphinidae	80	0	0	0	0	0	0	0	45	310	0	0	435

## B. Questionnaires for whale-watcher translations

- Portuguese

Inquérito (1)

Sou aluna da Faculdade de Ciências da Universidade de Lisboa e este inquérito é feito no âmbito da minha tese de Mestrado de Biologia da Conservação e é sobre a potencialidade de actividades de observação de cetáceos nas duas áreas marinhas protegidas de Portugal. A sua participação é voluntária e toda a informação é anónima e confidencial. O seu uso é apenas para fins científicos.

O inquérito está dividido em duas partes. O inquérito (1) é para responder no início da viagem. O inquérito (2) é para responder no fim da viagem. Marque com um **X** uma das opções em cada pergunta. Por favor não se esqueça de rever o inquérito para garantir que respondeu a todas as questões.

**Definição de observação de cetáceos:** actividade humana de encontro com animais do grupo dos cetáceos (golfinhos e baleias) no seu meio natural.

- Já fez esta actividade? Em caso afirmativo, onde? (Pode escolher mais do que uma opção)  
Sim ☐ fora do país ☐ dentro do país ☐ Não
- Quanto pagaria por actividades de observação de cetáceos (uma viagem)?  
☐ <€35 ☐ €35-€45 ☐ €46-€55 ☐ €56-€65 ☐ >€65 ☐ Não sei
- O que é um golfinho?  
☐ Mamífero ☐ Marsupial ☐ Peixe ☐ Tubarão ☐ Invertebrado ☐ Não sei
- O que é uma baleia?  
☐ Mamífero ☐ Marsupial ☐ Peixe ☐ Tubarão ☐ Invertebrado ☐ Não sei
- Que espécies de baleias/golfinhos é que espera ver? \_\_\_\_\_  
\_\_\_\_\_
- Desejava estar quanto tempo com os animais? ☐ <15 min ☐ 15-30 min ☐ >30 min
- Desejava estar perto dos animais? ☐ Sim ☐ Não
- O que pensa que pode tornar a actividade de hoje mais agradável? \_\_\_\_\_  
\_\_\_\_\_
- Gostaria de observar outro tipo de animais para além de cetáceos? Se sim, **especifique**.  
☐ Sim. Qual? \_\_\_\_\_ ☐ Não ☐ Não sei
- Quais os factores de ameaça aos cetáceos que conhece? \_\_\_\_\_
- Que medidas é que acha que devem ser tomadas para a conservação de cetáceos? \_\_\_\_\_  
\_\_\_\_\_
- O que acha que você pode fazer enquanto individuo para ajudar na conservação de cetáceos? \_\_\_\_\_

13. Numa escala de 1 a 5, como classificaria o impacto (negativo) desta actividade nos animais?

Nada ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Muito

14. Em relação à actividade que vai realizar, só soube da existência desta quando:

- ☐ Chegou ao local  
☐ Já sabia mas não influenciou a escolha do local  
☐ Influenciou a escolha do local

15. Está a realizar esta viagem para (selecione as **três principais razões**):

- |   |   |
|---|---|
| <input type="checkbox"/> Ver cetáceos                 | <input type="checkbox"/> Os filhos/companheiros é que queriam vir |
| <input type="checkbox"/> Gosto de viagens na Natureza | <input type="checkbox"/> Recomendado por alguém                   |
| <input type="checkbox"/> Gosto de viagens de barco    | <input type="checkbox"/> Pertence a uma excursão                  |
| <input type="checkbox"/> Para ver a paisagem          | <input type="checkbox"/> Para aprender sobre conservação          |
| <input type="checkbox"/> Para tirar fotografias       | <input type="checkbox"/> Outro motivo (especificar): _____        |

Idade ☐ 18-24 anos ☐ 25-45 anos ☐ 46-65 anos ☐ >65 anos

Género ☐ Masculino ☐ Feminino

Pais de origem \_\_\_\_\_ Cidade de origem \_\_\_\_\_ Cidade onde vive \_\_\_\_\_

Profissão ☐ Estudante ☐ Desempregado ☐ Reformado ☐ Exerce. O quê? \_\_\_\_\_

Grau de Formação (**completo**)

- |  |  |  |                                       |
|--|--|--|---------------------------------------|
| <input type="checkbox"/> Não tem       | <input type="checkbox"/> Ensino secundário | <input type="checkbox"/> Licenciatura  | <input type="checkbox"/> Mestrado     |
| <input type="checkbox"/> Ensino básico | <input type="checkbox"/> Bacharelato       | <input type="checkbox"/> Pós-graduação | <input type="checkbox"/> Doutoramento |

Área de Formação \_\_\_\_\_

Acompanhantes na viagem (**pode seleccionar várias opções**)

- |  |  |  |
|--|--|--|
| <input type="checkbox"/> Filhos              | <input type="checkbox"/> Outros familiares | <input type="checkbox"/> Colegas de trabalho |
| <input type="checkbox"/> Cônjuge/Namorado(a) | <input type="checkbox"/> Amigos            | <input type="checkbox"/> Vim sozinho(a)      |

## Inquérito (2)

1. O que é um golfinho?  
☐ Mamífero   ☐ Marsupial   ☐ Peixe   ☐ Tubarão   ☐ Invertebrado   ☐ Não sei
2. O que é uma baleia?  
☐ Mamífero   ☐ Marsupial   ☐ Peixe   ☐ Tubarão   ☐ Invertebrado   ☐ Não sei
3. Observou cetáceos na actividade de hoje? Se não, salte para a pergunta 7   ☐ Sim   ☐ Não
4. Que espécies de baleias/golfinhos é que viu? \_\_\_\_\_
5. Desejava ter estado mais tempo com os animais?  
☐ Não   ☐ Sim (até mais 15 min)   ☐ Sim (mais 15-30 min)   ☐ Sim (mais de 30 min)
6. Desejava ter estado mais perto dos animais?   ☐ Sim   ☐ Não
7. Em que medida é que a falta de observação de cetáceos o afectou? Responda só se a resposta à pergunta 3 tiver sido negativa.  
 Nada ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Muito
8. Quão satisfeito está com a actividade de hoje? Nada ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Muito
9. Em que medida é que a observação de aves marinhas iria tornar a actividade de hoje mais satisfatória?  
 Nada ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Muito
10. Gostaria que o skipper/biólogo que acompanha a viagem desse informações sobre as espécies de aves marinhas que observou? \_\_\_\_\_
11. Gostaria de aprender como é que se faz recolha de dados científicos nas embarcações de observação de cetáceos?   ☐ Sim   ☐ Não   ☐ Não sei
12. O que pensa que poderia ter tornado a actividade de hoje mais agradável? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
13. Numa escala de 1 a 5, como classificaria o impacto desta actividade nos animais?  
 Nada ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Muito
14. O impacto negativo que esta actividade poderia ter nos animais seria um impedimento para realizar a actividade?   ☐ Sim   ☐ Não   ☐ Não sei
15. Quais os factores de ameaça aos cetáceos que conhece? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_
16. Que medidas é que acha que devem ser tomadas para a conservação de cetáceos? \_\_\_\_\_  
 \_\_\_\_\_
17. O que acha que você pode fazer enquanto individuo para ajudar na conservação de cetáceos? \_\_\_\_\_
18. Voltaria a fazer esta actividade?   ☐ Sim   ☐ Não   ☐ Não sei

Obrigada pelo contributo e tempo dispensado.

No caso de querer informações sobre os resultados do inquérito e/ou receber a tese envie um e-mail com o seu pedido para o [inestg88@gmail.com](mailto:inestg88@gmail.com) ou deixe o seu e-mail:

\_\_\_\_\_

- English



## Questionnaire (1)

I am a student at Faculty of Science of Lisbon University (Faculdade de Ciências da Universidade de Lisboa) and this questionnaire is meant to be used in my master thesis of Conservation Biology and it is about the potentiality of whale and dolphin watching in two marine protected areas in Portugal. Your participation is voluntary and all information that you give is anonymous and confidential. It will be used for academic and scientific purpose.

This questionnaire is divided in two parts. Questionnaire (1) is to respond in the beginning of the trip. Questionnaire (2) is to respond at the end of the trip. Mark with and **X one** of the options from each question. Please be sure to review the questionnaire to ensure that you answered all the questions.

**Definition of whale and dolphin watching:** human activity of animal encounter with cetaceans (porpoises, dolphins and whales) in their natural habitat.

1. Have you ever done whale-watching? If yes, **where?** (You can pick more than one option)

Yes ☐ outside my country ☐ on my country ☐ No

2. How much would you pay for a trip of whale-watching?

☐ <€35 ☐ €35-€45 ☐ €46-€55 ☐ €56-€65 ☐ >€65 ☐ I don't know

3. What is a dolphin?

☐ Mammal ☐ Marsupial ☐ Fish ☐ Shark ☐ Invertebrate ☐ I don't know

4. What is a whale?

☐ Mammal ☐ Marsupial ☐ Fish ☐ Shark ☐ Invertebrate ☐ I don't know

5. What species of whales/dolphins do you expect to see? \_\_\_\_\_

6. Do you wish to stay with the animals for how long? ☐ <15 min ☐ 15-30 min ☐ >30 min

7. Do you wish to stay close to the animals? ☐ Yes ☐ No

8. What do you think that would turn the today's activity pleasant? \_\_\_\_\_

9. Would you like to see other animals beside cetaceans? If your answer is yes, **specify**.

☐ Yes. Which ones? \_\_\_\_\_ ☐ No ☐ I don't know

10. Which are the threat factors faced by cetaceans that you know? \_\_\_\_\_

11. What measures do you think should be taken for the conservation of cetaceans? \_\_\_\_\_

12. What do you think you can do as an individual to help in the conservation of cetaceans? \_\_\_\_\_

APPENDIX B

13. In a scale of 1 to 5, how would you rate the (negative) impact of this activity on the animals?

None ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> A lot

14. When did you become aware of the activity that you are about to do:

- ☐ Arrived at the scene  
☐ I already knew, but didn't influence the local choice  
☐ It took influence on the local choice

15. Why would you do this kind of activity? (**Pick 3 primary reasons**).

- |   |  |
|---|--|
| <input type="checkbox"/> To see whales and dolphins | <input type="checkbox"/> My children/companions wanted to come |
| <input type="checkbox"/> I like natural travelling  | <input type="checkbox"/> Recommended by someone                |
| <input type="checkbox"/> I like boat trips          | <input type="checkbox"/> It belongs to a tour                  |
| <input type="checkbox"/> To see the view            | <input type="checkbox"/> To learn about conservation           |
| <input type="checkbox"/> To take photos             | <input type="checkbox"/> Other motive (specify): _____         |

Age ☐ 18-24 years ☐ 25-45 years ☐ 46-65 years ☐ >65 years

Gender ☐ Male ☐ Female

Country of birth \_\_\_\_\_ City of birth \_\_\_\_\_ City where you live \_\_\_\_\_

Occupation ☐ Student ☐ Unemployed ☐ Retired ☐ Current position \_\_\_\_\_

Education (**complete**)

- |                                     |                                    |  |                                   |
|-------------------------------------|------------------------------------|--|-----------------------------------|
| <input type="checkbox"/> None       | <input type="checkbox"/> Secondary | <input type="checkbox"/> Undergraduate | <input type="checkbox"/> Master's |
| <input type="checkbox"/> Elementary | <input type="checkbox"/> Bachelors | <input type="checkbox"/> Post graduate | <input type="checkbox"/> Ph.D.    |

Academic degree subject \_\_\_\_\_

Group size (**you can choose multiple choices**)

- |  |  |                                     |
|--|--|-------------------------------------|
| <input type="checkbox"/> Children          | <input type="checkbox"/> Other relatives | <input type="checkbox"/> Co-workers |
| <input type="checkbox"/> Significant other | <input type="checkbox"/> Friends         | <input type="checkbox"/> Came alone |





## Questionnaire (2)

1. What is a dolphin?  
☐ Mammal   ☐ Marsupial   ☐ Fish   ☐ Shark   ☐ Invertebrate   ☐ I don't know
2. What is a whale?  
☐ Mammal   ☐ Marsupial   ☐ Fish   ☐ Shark   ☐ Invertebrate   ☐ I don't know
3. Did you see whales or dolphins today? If not, jump to question 7   ☐ Yes   ☐ No
4. What species of whales/dolphins did you see? \_\_\_\_\_  
 \_\_\_\_\_
- Did you wish to have stayed more time with the animals?  
☐ No   ☐ Yes (as much as 15 min)   ☐ Yes (15-30 min more)   ☐ Yes (more than 30 min)
5. Did you wish to have stayed closer to the animals?   ☐ Yes   ☐ No
6. In what way did the absence of whales and dolphins affect you? Answer only if you answer no to question 3  
 None   <sup>1</sup>☐   <sup>2</sup>☐   <sup>3</sup>☐   <sup>4</sup>☐   <sup>5</sup>☐   A lot
7. How satisfied are you with today's activity?  
 None   <sup>1</sup>☐   <sup>2</sup>☐   <sup>3</sup>☐   <sup>4</sup>☐   <sup>5</sup>☐   A lot
8. To what extent the observation of seabirds made or would make the activity more satisfying today?  
 None   <sup>1</sup>☐   <sup>2</sup>☐   <sup>3</sup>☐   <sup>4</sup>☐   <sup>5</sup>☐   A lot
9. Did you wish that the skipper/biologist that accompanies the journey had given you information about the seabirds that you saw? \_\_\_\_\_
10. Would you like to learn about the scientific data collection methods on whale watching boats?   ☐ Yes   ☐ No   ☐ I don't know
11. What do you think that would turn the today's activity pleasant?  
 \_\_\_\_\_  
 \_\_\_\_\_
12. In a scale of 1 to 5, how would you rate the impact of this activity on the animals?  
 None   <sup>1</sup>☐   <sup>2</sup>☐   <sup>3</sup>☐   <sup>4</sup>☐   <sup>5</sup>☐   A lot
13. The negative impact that this activity could have on the animals would be an impediment to perform whale-watching?   ☐ Yes   ☐ No   ☐ I don't know
14. Which are the threat factors faced by cetaceans that you know? \_\_\_\_\_  
 \_\_\_\_\_
15. What measures do you think should be taken for the conservation of cetaceans?  
 \_\_\_\_\_
16. What do you think you can do as an individual to help in the conservation of cetaceans? \_\_\_\_\_
17. Would you do this activity again?   ☐ Yes   ☐ No   ☐ I don't know

Thank you for your help and time.

In case you want to receive data about the results of this research or receive my thesis for further reading, send an e-mail with your request to [inestg88@gmail.com](mailto:inestg88@gmail.com) or leave your e-mail:  
 \_\_\_\_\_

- French



## Enquête (1)

Je suis une étudiante de la Faculté des Sciences de l'Université de Lisbonne (Faculdade de Ciências da Universidade de Lisboa) et ce sondage est fait dans ma thèse de maîtrise de la biologie de la conservation sur le potentiel de l'observation des cétacés dans deux aires marines protégées. Votre participation est volontaire et toutes les informations sont anonymes et confidentielles. Son utilisation est uniquement à des fins scientifiques.

L'enquête est divisée en deux parties. L'enquête (1) est de répondre au début du voyage. L'enquête (2) est de réunir à la fin du voyage. Signalet avec **X** une des options de chaque question.

**Définition de l'observation des cétacés:** une activité de rencontre entre humains et les animaux du groupe de cétacés (dauphins et baleines) dans leur environnement naturel.

1. Est-ce-que vous avez déjà fait cette activité? **Où?** (Vous pouvez choisir des options différentes)      Oui ☐ à l'étranger ☐ dans le pays ☐ Non
2. Combien payeriez-vous pour des activités d'observation des cétacés (un voyage)?  
☐ <€35    ☐ €35-€45    ☐ €46-€55    ☐ €56-€65    ☐ >€65    ☐ Je ne sais pas
3. A quelle groupe appartient un dauphin?  
☐ Mammifères ☐ Marsupiaux ☐ Poisson ☐ Requin ☐ Invertébrés ☐ Je ne sais pas
4. A quelle groupe appartient une baleine?  
☐ Mammifères ☐ Marsupiaux ☐ Poisson ☐ Requin ☐ Invertébrés ☐ Je ne sais pas
5. Qu'elles espèces de baleines/dauphins attendriez vous voir? \_\_\_\_\_  
 \_\_\_\_\_
6. Combien de temps desirez vous être avec ces animaux? ☐ <15 min ☐ 15-30 min ☐ >30 min
7. Voudriez-vous être tout près de ces animaux?      ☐ Oui      ☐ No
8. Qu'est que vous pensez que peut rendre plus agréable l'activité d'aujourd'hui?  
 \_\_\_\_\_  
 \_\_\_\_\_
9. Il vous intéresserait de faire l'observation d'autres type d'animaux que les cétacés? En cas positive, pourriez vous **le spécifier**?  
☐ Oui. Où? \_\_\_\_\_ ☐ Non ☐ Je ne sais pas
10. Quels sont les facteurs de menace pour les cétacés que vous connaissez? \_\_\_\_\_  
 \_\_\_\_\_
11. Quelles mesures pensez-vous qui doivent être prises pour la conservation des cétacés?  
 \_\_\_\_\_
12. Que pensez-vous que vous pouvez faire pour aider à la conservation des cétacés?  
 \_\_\_\_\_

13. Sur une échelle de 1 à 5, comment évalueriez-vous l'impact (négative) de cette activité chez les animaux?

Rien ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Très

14. Par rapport à l'entreprise à faire, seulement découvert à ce sujet lorsque:

- ☐ Arrivé à la scène
- ☐ Je savais déjà, mais n'ont pas influencé le choix de l'emplacement
- ☐ Influencé le choix de l'emplacement

15. Pourquoi feriez vous ce genre d'activité (Choisissez les **trois principales raisons**).

- ☐ Voir les cétacés
- ☐ J'aime voyager dans la Nature
- ☐ J'aime voyager par bateau
- ☐ Pour voir le paysage
- ☐ Pour prendre des photos
- ☐ Pour les enfants/partenaires
- ☐ Recommandé par quelqu'un
- ☐ Elle appartient à une tournée
- ☐ Pour en apprendre davantage sur la conservation
- ☐ Une autre raison (préciser): \_\_\_\_\_

Âge ☐ 18-24 années ☐ 25-45 années ☐ 46-65 années ☐ >65 années

Sexe ☐ Masculins ☐ Féminine

Pays d'origine \_\_\_\_\_ Ville d'origine \_\_\_\_\_ Ville où vous habitez \_\_\_\_\_

Profession ☐ Étudiant ☐ Chômeurs ☐ Retraite ☐ Fonctionne. Qu'est-ce? \_\_\_\_\_

Niveau de formation (**termine**)

☐ Aucune ☐ Lycée ☐ Licence ☐ Maîtrise

☐ Collège ☐ Baccalauréat ☐ Post-doc ☐ Doctorat

Spécialisation \_\_\_\_\_

Compagnons de voyage (**peut sélectionner plusieurs réponses**)

☐ Les enfants ☐ Autre famille ☐ Collègues

☐ Conjoint/Copain/Petit amie ☐ Amis ☐ Je suis venu seul

## Enquête (2)

1. A quelle groupe appartient un dauphin?  
☐ Mammifères ☐ Marsupiaux ☐ Poisson ☐ Requin ☐ Invertébrés ☐ Je ne sais pas
2. A quelle groupe appartient unne balaine?  
☐ Mammifères ☐ Marsupiaux ☐ Poisson ☐ Requin ☐ Invertébrés ☐ Je ne sais pas
3. Avéz vous observés cetacés dans l'activité d'aujourd'hui? Si non, passez à la question 7.  
☐ Oui ☐ Non
4. Quelles sont les espèces de baleines /dauphins que vous voyez? \_\_\_\_\_  
 \_\_\_\_\_
5. Vous souhaitez avoir été plus de temps avec les animaux?  
☐ Non ☐ Oui (jusqu'à 15 min) ☐ Oui (15-30 min) ☐ Oui (plus de 30 min)
6. Vous souhaitez d'avoir été plus proche de l'animal? ☐ Oui ☐ Non
7. Dans quelle mesure l'observation des cétacés vous a touché? **Répondre uniquement si la réponse à la question 3 a été négative.**  
 Rien ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Très
8. Comment vous a satisfait l'activité d'aujourd'hui?  
 Rien ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Très
9. Dans quelle mesure l'observation d'oiseaux de mer rend ou rendrait elle l'activité plus satisfaisant?  
 Rien ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Très
10. Souhaitez-vous que le skipper/biologiste vous donne des informations sur les espèces d'oiseaux de mer que l'on observe? \_\_\_\_\_
11. Aimerez-vous savoir comment on fait la collecte de données scientifiques sur les cétacés?  
☐ Oui ☐ Non ☐ Je ne sais pas
12. Que pensez-vous pourrait tourner l'activité d'aujourd'hui, plus agréable? \_\_\_\_\_  
 \_\_\_\_\_
13. Sur une échelle de 1 à 5, comment évalueriez-vous l'impact (négative) de cette activité chez les animaux?  
 Rien ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Très
14. L'impact négatif que cette activité pourrait avoir sur les animaux, serait-il un obstacle pour effectuer l'observation des baleines? ☐ Oui ☐ Non ☐ Je ne sais pas
15. Quels sont les facteurs de menace pour les cétacés que vous connaissez? \_\_\_\_\_  
 \_\_\_\_\_
16. Quelles mesures pensez-vous qui doivent être prises pour la conservation des cétacés?  
 \_\_\_\_\_
17. Que pensez-vous que vous pouvez faire pour aider à la conservation des cétacés?  
 \_\_\_\_\_
18. Feriez-vous cette activité nouveau? ☐ Oui ☐ Non ☐ Je ne sais pas

Merci pour votre contribution et votre temps.

Dans le cas de recherche d'information sur les résultats du sondage et /ou recevoir la thèse envoyer un email avec votre demande pour [inestg88@gmail.com](mailto:inestg88@gmail.com) ou laisser votre adresse e-mail : \_\_\_\_\_

- German

## Umfrage (1)

Ich studiere in der Wissenschaftshochschule von Lissabon Universität (Faculdade de Ciências da Universidade de Lisboa) und diese Umfrage brauche ich für meine These, um Meister in Biologieerhaltung zu werden. Sie handelt sich um das Potenzial der Beobachtungsaktivitäten von Cetaceen in der zweiten beschützten Seegebiete in Portugal. Ihre Teilnahme ist freiwillig und alle Informationen sind anonym und vertraulich und nur für wissenschaftliche Ziele benutzt.

Die Umfrage ist in zwei Teile organisiert. Nummer (1) muss am Anfang der Reise geantwortet werden. Nummer (2) am Ende der Reise. Nur eine Wahl soll mit **X** kennengezeichnet werden, bitte. Vergessen Sie nicht die Umfrage wiederzusehen, um zu garantieren, dass Sie alle Frage geantwortet haben.

**Definition von Cetaceenbeobachtung:** die Menschenaktivitäten, wenn sie sich mit der Gruppetieren von Cetaceen (Delphine und Wale) in freier Natur treffen.

**16. Haben Sie schon dieses erlebt? Wenn ja, wo? (Mehr als eine Wahl ist möglich)**

Ja ☐ im Ausland ☐ in meiner Heimat ☐ Nein

**17. Wieviel würden Sie für diese Aktivität über Cetaceenbeobachtung bezahlen (eine Reise)?**

☐ <€35 ☐ €35-€45 ☐ €46-€55 ☐ €56-€65 ☐ >€65 ☐ Weiss nicht

**18. Was ist ein Delphin?**

☐ Säugetier ☐ Beutelartig ☐ Fish ☐ Haifish ☐ Wirbellos ☐ Weiss nicht

**19. Was ist eine Wal?**

☐ Säugetier ☐ Beutelartig ☐ Fish ☐ Haifish ☐ Wirbellos ☐ Weiss nicht

**20. Welche Sorte von Wale oder Delphine erwarten Sie zu sehen ?** \_\_\_\_\_

**21. Wie lange wüshten Sie mit den Tieren zu sein?**

☐ 15 Minuten ☐ 15-30 Minuten ☐ >30 Minuten

**22. Wüshten Sie näher von den Tieren zu sein?** ☐ Ja ☐ Nein

**23. Ihrer Meinung nach, wie könnte diese Aktivität angenehmer werden ?** \_\_\_\_\_

**24. Möchten Sie andere Tiersorten beobachten ausser der Cetaceen? Wenn ja, spezifizieren Sie, bitte**

☐ Ja. Welche? \_\_\_\_\_ ☐ Nein ☐ Weiss nicht

**25. Welche Faktoren, die die Cetaceen bedrohen, kennen Sie?** \_\_\_\_\_

**26. Welche Massnahme, glauben Sie, sollte man treffen, um Cetaceen zu erhalten?** \_\_\_\_\_

**27. Als Mensch, was könnten Sie tun, um Cetaceenerhaltung zu helfen?** \_\_\_\_\_

## APPENDIX B

28. In einer Skala von 1 bis 5, wie klassifizierten Sie die Wirkung (negativ) dieser Aktivität auf die Tiere?

Nichts ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Viel

29. Betreffs dieser Aktivität, Sie haben die nur Kennengelernt:

- ☐ Als Sie im Lokal angekommen sind  
☐ Sie wussten schon, aber sie hatte kein Einfluss auf die Lokalswahl  
☐ Doch, sie hatte darauf Einfluss

30. Sie machen diese Reise jetzt (**wählen Sie 3 Hauptgründe auf, bitte**):

- |   |  |
|---|--|
| <input type="checkbox"/> Um Cetaceen zu sehen       | <input type="checkbox"/> meine Kinder / Freunde wollten sie    |
| <input type="checkbox"/> ich mag Naturreisen        | <input type="checkbox"/> jemand hat sie empfohlen              |
| <input type="checkbox"/> ich mag Schiffsreisen      | <input type="checkbox"/> sie gehört zu einer Tour              |
| <input type="checkbox"/> Um die Landschaft zu sehen | <input type="checkbox"/> Um etwas über Tiererhaltung zu lernen |
| <input type="checkbox"/> Zu fotografieren           | <input type="checkbox"/> Anders (spezifizieren): _____         |

Alter ☐ 18-24 Jahre ☐ 25-45 Jahre ☐ 46-65 Jahre ☐ >65 Jahre

Geschlecht ☐ Mann ☐ Frau

Nationalität \_\_\_\_\_ Geburtsstadt \_\_\_\_\_ Wohnort \_\_\_\_\_

Beruf ☐ Student ☐ Arbeitslos ☐ Pensioniert ☐ Anders \_\_\_\_\_

Ausbildung (**mit Abschluss**)

- |                                      |  |  |                                       |
|--------------------------------------|--|--|---------------------------------------|
| <input type="checkbox"/> Hat nicht   | <input type="checkbox"/> Sekundarschule                    | <input type="checkbox"/> Hochschulestudium | <input type="checkbox"/> Meisterhaft  |
| <input type="checkbox"/> Grundschule | <input type="checkbox"/> Drei Jahre Universität<br>studium | <input type="checkbox"/> Postgraduierung   | <input type="checkbox"/> Doktorarbeit |

Welche Ausbildung \_\_\_\_\_

Begleiter in Ihrer Reise (**verschiedenen Wähle** sind möglich)

- |   |   |   |
|---|---|---|
| <input type="checkbox"/> Kinder           | <input type="checkbox"/> Andere Familie | <input type="checkbox"/> Arbeitskollege |
| <input type="checkbox"/> Gatte/Freund(in) | <input type="checkbox"/> Freunde        | <input type="checkbox"/> Allein         |



## Umfrage (2)

1. Was ist ein Delphin?

☐ Säugetier ☐ Beutelartig ☐ Fish ☐ Haifish ☐ Wirbellos ☐ Weiss nicht

2. Was ist eine Wal?

☐ Säugetier ☐ Beutelartig ☐ Fish ☐ Haifish ☐ Wirbellos ☐ Weiss nicht

3. Haben Sie Cetaceen heute beobachtet? **Wenn nicht, antworten Sie nur ab die Frage 7.**

☐ Ja ☐ Nien

4. Welche Wale/Delphinarten haben Sie gesehen? \_\_\_\_\_

Wünschten Sie länger mit den Tieren zu bleiben?

☐ Nein ☐ Ja (15 Minuten mehr) ☐ Ja (15-30 Minuten) ☐ Ja (mehr als 30 Minuten)

5. Wünschten Sie näher von den Tieren zu bleiben? ☐ Ja ☐ Nein

6. Wieweit wurden Sie aufregt, weil Sie keine Cetaceen beobachtet haben? **Antworten Sie nur, wenn die Frage 3 negativ war.**

Nichts ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Viel

7. Wieweit fühlten Sie sich zufrieden mit dieser Aktivität? Nichts ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Viel

8. Wieweit wurde die Seevögelbeobachtung für Sie angenehmer oder wie konnte die heutige Aktivität besser sein?

Nichts ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Viel

9. Wünschten Sie, dass der Skipper/ Biologe, der diese Reise Sie begleiten, einige Information über die Seevögelspecies gab? **(die Sie beobachtet haben)** ☐ Ja ☐ Nien ☐ Weiss nicht

10. Möchten Sie wissen, wie man alle wissenschaftlichen Informationen in dem Schiff bekam?

☐ Ja ☐ Nein ☐ Weiss nicht

11. Wie denken Sie, dass diese Aktivität angenehmer werden könnte? \_\_\_\_\_

12. In einer Skala von 1 bis 5, wie Klassifizierten Sie die Wirkung (negativ) auf die Tiere?

Nichts ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Viel

13. Falls die negativ Wirkung, die diese Aktivität auf die Tiere haben könnte, sollte verhindert werden?

☐ Ja ☐ Nein ☐ Weiss nicht

14. Welche Faktoren, die die Cetaceen bedrohen, kennen Sie? \_\_\_\_\_

15. Welche Massnahme, glauben Sie, sollte man treffen, um Cetaceen zu schützen? \_\_\_\_\_

16. Als Mensch, was könnte Sie tun, um Cetaceenerhaltung zu helfen? \_\_\_\_\_

17. Möchten Sie diese Aktivität wieder machen? ☐ Ja ☐ Nein ☐ Weiss nicht

Vielen Dank für Ihren Beitrag

Falls Sie etwas über dieser Arbeit Bescheid wünschen und / oder die These bekommen, sender Sie ein E-mail nach [inestg88@gmail.com](mailto:inestg88@gmail.com) oder schreiben Sie Ihren E-mail:

- Spanish



## Cuestionario (1)

Soy alumna de la la Facultad de Ciencias de la Universidad de Lisboa (Faculdade de Ciências da Universidade de Lisboa) y este cuestionario está realizado en el ámbito de mi tesis de Master de Biología de la Conservación y trata sobre la potencialidad de las actividades de observación de cetáceos en las dos Áreas Marinas Protegidas de Portugal. Su participación es voluntaria y la información es anónima y confidencial. Su utilización es para fines científicos. Marque con **una X** una de las opciones en cada pregunta.

El cuestionario está dividido en dos partes. El cuestionario (1) es para responder en lo inicio de la viajen. El cuestionario (2) es para responder en lo fin da viajen. Marque con una **X una** de las opciones en cada pregunta.

**Definición de la observación de cetáceos:** actividad humana de encuentro con animales del grupo de los cetáceos (delfines y ballenas) en su medio natural.

1. ¿Ya realizó esta actividad? En caso afirmativo, ¿**dónde**? (Puede elegir más de una opción).  
Si ☐ fuera del país ☐ dentro del país ☐ No
2. ¿Cuanto pagaría por actividades de observación de cetáceos (un viaje)?  
☐ <€35 ☐ €35-€45 ☐ €46-€55 ☐ €56-€65 ☐ >€65 ☐ No sé
3. ¿Qué es un delfín?  
☐ Mamífero ☐ Marsupial ☐ Pescado ☐ Tiburón ☐ Invertebrado ☐ No sé
4. ¿Qué es una ballena?  
☐ Mamífero ☐ Marsupial ☐ Pescado ☐ Tiburón ☐ Invertebrado ☐ No sé
5. ¿Que especies de ballenas o delfines espera ver? \_\_\_\_\_  
\_\_\_\_\_
6. ¿ Quería estar cuanto tiempo con los animales? ☐ 15 min ☐ 15-30 min ☐ > 30 min
7. ¿Quería estar cerca de los animales? ☐ Si ☐ No
8. ¿Qué crees que puede hacer que la actividad de hoy sea más placentera?  
\_\_\_\_\_  
\_\_\_\_\_
9. ¿Te gustaría de ver a otros animales, así como los cetáceos? En caso afirmativo, **especificar**.  
☐ Si. Quales? \_\_\_\_\_ ☐ No ☐ No sé
10. ¿Cuáles son los factores de amenaza para los cetáceos que conoce? \_\_\_\_\_  
\_\_\_\_\_
- 11.¿Qué medidas crees que se deben tomar para la conservación de los cetáceos? \_\_\_\_\_  
\_\_\_\_\_
- 12.¿Qué crees que puedes hacer a nivel individual para ayudar en la conservación de los cetáceos? \_\_\_\_\_



13. ¿En una escala de 1 a 5, ¿cómo clasificaría el impacto (negativo) de esta actividad en los animales?

Nada      <sup>1</sup>☐ <sup>2</sup>☐ <sup>3</sup>☐ <sup>4</sup>☐ <sup>5</sup>☐ Mucho

14. ¿En relación a la actividad que se va a realizar, sólo se enteró de esto cuando?

- ☐ Llegó a la escena  
☐ Todavía sabía pero no ha influenciado la selección del local  
☐ Influencio la selección del local

15. Este viaje es para (Escoja las **tres principales razones**):

- |   |   |
|---|---|
| <input type="checkbox"/> Ver cetáceos                           | <input type="checkbox"/> Los hijos/compañeros querían venir |
| <input type="checkbox"/> Me gustan los viajes por la naturaleza | <input type="checkbox"/> Recomendado por alguien            |
| <input type="checkbox"/> Me gustan los viajes en barco          | <input type="checkbox"/> Pertenece a un grupo               |
| <input type="checkbox"/> Para ver el paisaje                    | <input type="checkbox"/> Para aprender sobre conservación   |
| <input type="checkbox"/> Para hacer fotografías                 | <input type="checkbox"/> Otro motivo (especificar): _____   |

Edad      ☐ 18-24 años    ☐ 25-45 años    ☐ 46-65 años    ☐ >65 años

Género    ☐ Masculino    ☐ Femenino

País de origen \_\_\_\_\_ Ciudad de origen \_\_\_\_\_ Ciudad donde vive \_\_\_\_\_

Profesión    ☐ Estudiante    ☐ Desempleado    ☐ Jubilado    ☐ Trabaja en qué? \_\_\_\_\_

Grado de Formación (**completo**)

- |                                    |  |                                       |                                    |
|------------------------------------|--|---------------------------------------|------------------------------------|
| <input type="checkbox"/> No tiene  | <input type="checkbox"/> E. secundaria | <input type="checkbox"/> Licenciatura | <input type="checkbox"/> Master    |
| <input type="checkbox"/> E. básica | <input type="checkbox"/> Bachillerato  | <input type="checkbox"/> Postgrado    | <input type="checkbox"/> Doctorado |

Área de Formación \_\_\_\_\_

Acompañantes en la viajen (pode seleccionar varias respuesta)

- |  |   |   |
|--|---|---|
| <input type="checkbox"/> Niños         | <input type="checkbox"/> Otros familiares | <input type="checkbox"/> Colegas de trabajo |
| <input type="checkbox"/> Cónyuge/Novio | <input type="checkbox"/> Amigos           | <input type="checkbox"/> Vine solo          |

## Cuestionario (2)



1. ¿Qué es un delfín?  
☐ Mamífero   ☐ Marsupial   ☐ Pescado   ☐ Tiburón   ☐ Invertebrado   ☐ No sé
2. ¿Qué es una ballena?  
☐ Mamífero   ☐ Marsupial   ☐ Pescado   ☐ Tiburón   ☐ Invertebrado   ☐ No sé
3. ¿Ha observado cetáceos in su actividad hoy? Si no, pase à la pregunta 7   ☐   ☐
4. ¿Que especies de ballenas o delfines hay visto? \_\_\_\_\_  
 \_\_\_\_\_
- A. ¿Deseaba ter compartido más tiempo con los animales?  
☐ No   ☐ Si (aún más de 15 min)   ☐ Si (15-30 min)   ☐ Si (más de 30 min)
6. ¿Deseaba ter estado más cerca de los animales?   ☐ Si   ☐ No
7. ¿En que medida es que la falta de observación de los cetáceos le ha afectado? **Solo debe responder si la respuesta a la quistión 3 fue negativa.**  
 Nada <sup>1</sup>☐ <sup>2</sup>☐ <sup>3</sup>☐ <sup>4</sup>☐ <sup>5</sup>☐ Mucho
8. ¿Está satisfecho con la actividad de hoy?  
 Nada <sup>1</sup>☐ <sup>2</sup>☐ <sup>3</sup>☐ <sup>4</sup>☐ <sup>5</sup>☐ Mucho
9. ¿En qué medida es que la observación de aves marinas poderia tornar la actividad de hoy más gratificante?  
 Nada <sup>1</sup>☐ <sup>2</sup>☐ <sup>3</sup>☐ <sup>4</sup>☐ <sup>5</sup>☐ Mucho
10. ¿Te gustaría que el patrón/biólogo que sigue en el viaje diese información sobre las especies de aves marinas que se observa? \_\_\_\_\_
11. ¿Gustaría de aprender como é que se faz colección de dados científicos en la observación de cetáceos?   ☐ Si   ☐ No   ☐ No sé
12. ¿Como se podría ter tornado la actividad de hoy más agradable? \_\_\_\_\_  
 \_\_\_\_\_
13. ¿En una escala de 1 a 5 como clasificaria el impacto de esta actividad en los animales?  
 Nada <sup>1</sup>☐ <sup>2</sup>☐ <sup>3</sup>☐ <sup>4</sup>☐ <sup>5</sup>☐ Mucho
14. ¿El impacto negativo que esta actividad podría tener sobre los animales sería un impedimento para hacerlo?   ☐ Si   ☐ No   ☐ No sé
16. ¿Cuáles son los factores de amenaza para los cetáceos que conoce? \_\_\_\_\_  
 \_\_\_\_\_
17. ¿Qué medidas crees que se deben tomar para la conservación de los cetáceos? \_\_\_\_\_  
 \_\_\_\_\_
18. ¿Qué crees que puedes hacer a nivel individual para ayudar en la conservación de los cetáceos? \_\_\_\_\_
19. ¿Volvería a hacer esta actividad?   ☐ Si   ☐ No   ☐ No sé

Muchas gracias por su contribución y tiempo utilizado.

En caso de querer información sobre los resultados del cuestionario y/o recibir la tesis envíe un e-mail con la petición a: [inestg88@gmail.com](mailto:inestg88@gmail.com) ou deje su e-mail: \_\_\_\_\_

## C. Questionnaires for potential whale-watcher translations

### C.1 Link for the online questionnaire

<https://docs.google.com/spreadsheets/viewform?formkey=dGRoaVRSaUwtckYxQk1YLU9EZGtLR0E6MQ#gid=0>

### C.2 Translations for the onsite questionnaires

- Portuguese



## Inquérito

Sou aluna da Faculdade de Ciências da Universidade de Lisboa e este inquérito é feito no âmbito da minha tese de Mestrado de Biologia da Conservação e é sobre a **potencialidade de actividades de observação de cetáceos nas duas áreas marinhas protegidas de Portugal**. A sua participação é voluntária e toda a informação é anónima e confidencial. O seu uso é apenas para fins científicos. Marque com um **X** uma das opções em cada pergunta se não for pedido mais respostas. Por favor não se esqueça de rever o inquérito para garantir que respondeu a todas as questões.

**Definição de observação de cetáceos:** actividade humana de encontro com animais do grupo dos cetáceos (golfinhos e baleias) no seu meio natural.

20. Existe este tipo de actividade no país onde reside? ☐ Sim ☐ Não ☐ Não sei

21. Já fez esta actividade? Em caso afirmativo, **onde**? (Pode escolher mais do que uma opção)  
Sim ☐ fora do país ☐ dentro do país ☐ Não

22. Gostaria de fazer/repetir essa actividade? (Em caso negativo, depois de **justificar** a sua posição, salte em seguida para a pergunta 12).

☐ Sim ☐ Não. Porque \_\_\_\_\_ ☐ Não sei

23. Porque faria este tipo de actividade? (Escolha as **três principais razões**).

- |   |   |
|---|---|
| <input type="checkbox"/> Ver cetáceos                 | <input type="checkbox"/> Os filhos/companheiros é que queriam vir |
| <input type="checkbox"/> Gosto de viagens na Natureza | <input type="checkbox"/> Recomendado por alguém                   |
| <input type="checkbox"/> Gosto de viagens de barco    | <input type="checkbox"/> Pertence a uma excursão                  |
| <input type="checkbox"/> Para ver a paisagem          | <input type="checkbox"/> Para aprender sobre conservação          |
| <input type="checkbox"/> Para tirar fotografias       | <input type="checkbox"/> Outro motivo (especificar): _____        |

24. Quanto pagaria por actividades de observação de cetáceos (uma viagem)?

☐ <€35 ☐ €35-€45 ☐ €46-€55 ☐ €56-€65 ☐ >€65 ☐ Não sei

25. Qual a altura do ano em que faria a actividade? (Pode escolher várias opções).

☐ Primavera ☐ Verão ☐ Outono ☐ Inverno ☐ Todo o ano ☐ Não sei

26. Quanto tempo gostaria de estar no mar? ☐ <1 hora ☐ 3 h ☐ 5 h ☐ 8 h ☐ Não sei

27. Prefere um barco com que lotação máxima: ☐ 4 pessoas ☐ 12 pessoas ☐ 24 pessoas ☐ Não sei

28. Gostaria de ter informação na viagem sobre (pode escolher várias opções):

- |  |   |
|--|---|
| <input type="checkbox"/> Conservação de cetáceos em Portugal | <input type="checkbox"/> A comunicação dos cetáceos       |
| <input type="checkbox"/> Características únicas de cetáceos  | <input type="checkbox"/> Predadores e presas dos cetáceos |
| <input type="checkbox"/> O papel dos cetáceos no ecossistema | <input type="checkbox"/> Outras (especificar): _____      |

## APPENDIX C

**29.** Onde gostaria de fazer a actividade? (Pode escolher várias opções)

- |   |  |
|---|--|
| <input type="checkbox"/> Ilhas (Açores e Madeira) | <input type="checkbox"/> Perto da zona de residência |
| <input type="checkbox"/> Zona norte do país       | <input type="checkbox"/> Qualquer local do país      |
| <input type="checkbox"/> Zona centro do país      | <input type="checkbox"/> Fora do país                |
| <input type="checkbox"/> Zona sul do país         | <input type="checkbox"/> Não sei                     |

**30.** Qual a taxa mínima de avistamento de cetáceos (número de saídas em que se vê cetáceos) de um empresa que o levaria a fazer a actividade?

\_\_\_\_\_ %    ☐ Não sei    ☐ Não é essencial vê-los

**31.** Gostaria de ver outros animais para além de cetáceos?

☐ Sim. Quais? \_\_\_\_\_ ☐ Não. Porque \_\_\_\_\_ ☐ Não sei

**32.** Se fosse numa actividade de observação de cetáceos, gostaria que esta fosse complementada com observação de aves marinhas? ☐ Sim ☐ Não ☐ Não sei

**33.** Estaria disposto a pagar mais se a actividade fosse complementada com a observação de aves marinhas? Quanto?

☐ Sim. Mais € \_\_\_\_\_ ☐ Não. Porque \_\_\_\_\_ ☐ Não sei

**34.** Gostaria de aprender como é que se faz recolha de dados científicos nas embarcações de observação de cetáceos? ☐ Sim ☐ Não ☐ Não sei

**35.** Numa escala de 1 a 5, como classificaria o impacto (negativo) desta actividade nos animais?

Nada    ☐ <sup>1</sup>    ☐ <sup>2</sup>    ☐ <sup>3</sup>    ☐ <sup>4</sup>    ☐ <sup>5</sup>    muito

**36.** O impacto negativo que esta actividade poderia ter nos animais seria um impedimento para realizá-la? ☐ Sim ☐ Não ☐ Não sei

Idade    ☐ 18-24 anos    ☐ 25-45 anos    ☐ 46-65 anos    ☐ >65 anos

Género    ☐ Masculino    ☐ Feminino

País de origem \_\_\_\_\_ Cidade de origem \_\_\_\_\_ Cidade onde vive \_\_\_\_\_

Profissão    ☐ Estudante    ☐ Desempregado    ☐ Reformado    ☐ Exerce. O quê? \_\_\_\_\_

**Grau de Formação (completo)**

- |  |  |  |                                       |
|--|--|--|---------------------------------------|
| <input type="checkbox"/> Não tem       | <input type="checkbox"/> Ensino secundário | <input type="checkbox"/> Licenciatura  | <input type="checkbox"/> Mestrado     |
| <input type="checkbox"/> Ensino básico | <input type="checkbox"/> Bacharelato       | <input type="checkbox"/> Pós-graduação | <input type="checkbox"/> Doutoramento |

Área de Formação \_\_\_\_\_

Obrigada pelo contributo e tempo dispensado.

No caso de querer informações sobre os resultados do inquérito e/ou receber a tese envie um e-mail com o seu pedido para o [inestg88@gmail.com](mailto:inestg88@gmail.com) ou deixe o seu e-mail:

\_\_\_\_\_



- English

## Questionnaire

I am a student at Faculty of Science of Lisbon University (Faculdade de Ciências da Universidade de Lisboa) and this questionnaire is meant to be used in my master thesis of Conservation Biology and it is about the potentiality of whale and dolphin watching in two marine protected areas in Portugal. Your participation is voluntary and all information that you give is anonymous and confidential. It will be used for scientific purpose. Mark with an **X** one of the options from each question if not asked otherwise. Please be sure to review the questionnaire to ensure that you answered all the questions.

**Definition of whale and dolphin watching:** human activity of animal encounter with dolphins or whales in their natural habitat.

- Do you have this kind of activity in your country of birth? ☐ Yes ☐ No ☐ I don't know
- Have you ever done whale-watching? If yes, **where**? (You can pick more than one option)  
Yes ☐ outside my country ☐ on my country ☐ No
- Do you wish to do or repeat any of these activities? (In case you said no, please tell **why** not and go to question 12).  
☐ Yes ☐ No. Because \_\_\_\_\_ ☐ I don't know
- Why would you do this kind of activity? (**Pick 3 primary reasons**).  

<input type="checkbox"/> To see whales and dolphins	<input type="checkbox"/> My children/companions wanted to come
<input type="checkbox"/> I like natural travelling	<input type="checkbox"/> Recommended by someone
<input type="checkbox"/> I like boat trips	<input type="checkbox"/> It belongs to a tour
<input type="checkbox"/> To see the view	<input type="checkbox"/> To learn about conservation
<input type="checkbox"/> To take photos	<input type="checkbox"/> Other motive (specify): _____
- How much would you pay for a trip of whale-watching?  
☐ <€35    ☐ €35-€45    ☐ €46-€55    ☐ €56-€65    ☐ >€65    ☐ I don't know
- What time of the year would you prefer to do whale-watching? (You can choose multiple options).  
☐ Spring    ☐ Summer    ☐ Autumn    ☐ Winter    ☐ All year    ☐ I don't know
- How long would you like to be at sea? ☐ <1 hour ☐ 3 h ☐ 5 h ☐ 8 h ☐ I don't know
- Do you prefer a boat with which maximum capacity? ☐ 4 pax ☐ 12 pax ☐ 24 pax ☐ I don't know
- I would like, in the trip, to learn about (you can choose multiple options):  

<input type="checkbox"/> Conservation of cetaceans in Portugal	<input type="checkbox"/> The communication of cetaceans
<input type="checkbox"/> Unique features of cetaceans	<input type="checkbox"/> Predators and preys of cetaceans
<input type="checkbox"/> The role of cetaceans in the ecosystem	<input type="checkbox"/> Other (specify): _____
- Where would you like to do whale-watching? (You can choose multiple options).  

<input type="checkbox"/> Islands (Azores and Madeira)	<input type="checkbox"/> Near your zone of residence
<input type="checkbox"/> North region of Portugal	<input type="checkbox"/> Anywhere in Portugal
<input type="checkbox"/> Central region of Portugal	<input type="checkbox"/> Outside Portugal
<input type="checkbox"/> South region of Portugal	<input type="checkbox"/> I don't know

APPENDIX C

11. What is the minimum encounter rate of cetacean sightings (number of boat trips in which you see cetaceans) from a company that would you do the activity?

\_\_\_\_\_ % ☐ I don't know ☐ It is not essential to see them

12. Would you like to see other animals besides cetaceans?

☐ Yes. Which ones? \_\_\_\_\_ ☐ No. Because \_\_\_\_\_ ☐ I don't know

13. If you were taking a whale watching trip, would you like to complement the activity with seabird watching? ☐ Yes ☐ No ☐ don't know

14. Would you be willing to pay more if the activity was complemented with the observation of seabirds? How much more?

☐ Yes. More € \_\_\_\_\_ ☐ No. Because \_\_\_\_\_ ☐ I don't know

15. Would you like to learn about the scientific data collection methods on whale watching boats? ☐ Yes ☐ No ☐ I don't know

16. In a scale of 1 to 5, how would you rate the (negative) impact of this activity on the animals?

None ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> A lot

17. The negative impact that this activity could have on the animals would be an impediment to perform whale-watching? ☐ Yes ☐ No ☐ I don't know

Age ☐ 18-24 years ☐ 25-45 years ☐ 46-65 years ☐ >65 years

Gender ☐ Male ☐ Female

Country of Origin \_\_\_\_\_ City of Origin \_\_\_\_\_ City of Residence \_\_\_\_\_

Occupation ☐ Student ☐ Unemployed ☐ Retired ☐ Current position \_\_\_\_\_

Education (complete)

☐ None ☐ Secondary ☐ Undergraduate ☐ Master's

☐ Elementary ☐ Bachelor's ☐ Post graduate ☐ Ph.D.

Academic degree subject \_\_\_\_\_

Thank you for your help and time.

In case you want to receive data about the results of this research or receive my thesis for further reading send an e-mail with your request to [inestg88@gmail.com](mailto:inestg88@gmail.com) or leave your e-mail:

\_\_\_\_\_

- French



## Enquête

Je suis une étudiante de la Faculté des Sciences de l'Université de Lisbonne (Faculdade de Ciências da Universidade de Lisboa) et ce sondage est fait dans ma thèse de maîtrise de biologie de la conservation sur le potentiel de l'observation des cétacés dans deux zones marines protégées. Votre participation est volontaire et toutes les informations sont anonymes et confidentielles. Son utilisation est uniquement à des fins scientifiques. Signalez avec **X une** des options de chaque questions. S'il vous plaît assurez-vous d'examiner l'enquête pour s'assurer que répondu à toutes les questions.

**Définition de l'observation des cétacés:** une activité de rencontre entre humains et les animaux du groupe de cétacés (dauphins et baleines) dans leur environnement naturel.

- Il y a ce genre d'activité dans votre pays? ☐ Oui ☐ Non ☐ Je ne sais pas
- Est-ce que vous avez déjà fait cette activité? **Où?** (Vous pouvez choisir des options différentes). Oui ☐ à l'étranger ☐ dans le pays ☐ Non
- Je tiens à faire/répéter cette activité? **Si la réponse était non, s'il vous plaît justifier votre position.** (Si non, passez à la question 12).  
☐ Oui ☐ Non. Parce \_\_\_\_\_ ☐ Je ne sais pas
- Pourquoi feriez vous ce genre d'activité? (Choisissez les **trois principales raisons**).  

<input type="checkbox"/> Voir les cétacés	<input type="checkbox"/> Pour les enfants/patenaies
<input type="checkbox"/> J'aime voyager dans la nature	<input type="checkbox"/> Recommandé par quelqu'un
<input type="checkbox"/> J'aime voyager par bateau	<input type="checkbox"/> Elle appartient à une tournée
<input type="checkbox"/> Pour voir le paysage	<input type="checkbox"/> Pour en apprendre davantage sur la conservation
<input type="checkbox"/> Pour prendre des photos	<input type="checkbox"/> Une autre raison (préciser): _____
- Combien payeriez-vous pour des activités d'observation des cétacés (un voyage)?  
☐ <€35    ☐ €35-€45    ☐ €46-€55    ☐ €56-€65    ☐ >€65    ☐ Je ne sais pas
- Qu'est-ce moment de l'année desirés vous faire l'activité? (Vous pouvez choisir des options différentes).  
☐ Printemps    ☐ Été    ☐ Automne    ☐ Hiver    ☐ Toute l'année    ☐ Je ne sais pas
- Combien de temps souhaitez-vous être à la mer? ☐ < 1 heure ☐ 3h ☐ 5h ☐ 8h ☐ Je ne sais pas
- Préférez-vous un bateau avec quelle capacité maximale:  
☐ 4 personnes    ☐ 12 personnes    ☐ 24 personnes    ☐ Je ne sais pas
- Quelles sont les questions sur lesquelles aimeriez-vous avoir des informations (vous pouvez choisir des options différentes):  

<input type="checkbox"/> Conservation des cétacés au Portugal	<input type="checkbox"/> La communication entre les cétacés
<input type="checkbox"/> Caractéristiques uniques des cétacés	<input type="checkbox"/> Le rôle des cétacés dans l'écosystème
<input type="checkbox"/> Les prédateurs et les proies des cétacés	<input type="checkbox"/> Autre (préciser): _____

## APPENDIX C

10. Où aimeriez-vous faire de l'activité? (Vous pouvez choisir des options différentes).

- |   |   |
|---|---|
| <input type="checkbox"/> Îles (Açores et Madeira) | <input type="checkbox"/> Près de la zone de résidence |
| <input type="checkbox"/> Nord du pays             | <input type="checkbox"/> N'importe où dans le pays    |
| <input type="checkbox"/> Centre du pays           | <input type="checkbox"/> À l'étranger                 |
| <input type="checkbox"/> Sud du pays              | <input type="checkbox"/> Je ne sais pas               |

11. Quel est le taux minimum de l'observation des cétacés que vous considérez acceptable pour effectuer cette activité?

\_\_\_\_\_ % ☐ Je ne sais pas ☐ Il n'est pas indispensable de les voir

12. Aimeriez-vous voir d'autres animaux ainsi que les cétacés?

☐ Oui. Lesquelles? \_\_\_\_\_ ☐ Non. Parce que \_\_\_\_\_ ☐ Je ne sais pas

13. Dans une activité d'observation des cétacés vous serez intéressés aussi à faire l'observation d'oiseaux de mer? ☐ Oui ☐ Non ☐ Je ne sais pas

14. Seriez-vous prêt à payer plus si l'activité était complète par l'observation des oiseaux de mer? Combien?

☐ Oui. Plus \_\_\_\_\_ ☐ Non. Parce que \_\_\_\_\_ ☐ Je ne sais pas

14. Aimeriez-vous savoir comment on fait la collecte de données scientifiques sur les cétacés?

☐ Oui ☐ Non ☐ Je ne sais pas

16. Sur une échelle de 1 à 5, comment évalueriez-vous l'impact négatif de cette activité chez les animaux?

Rien ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Très

17. L'impact négatif que cette activité pourrait avoir sur les animaux, serait-il un obstacle pour effectuer l'observation des baleines? ☐ Oui ☐ Non ☐ Je ne sais pas

Âge ☐ 18-24 années ☐ 25-45 années ☐ 46-65 années ☐ >65 années

Sexe ☐ Masculins ☐ Féminine

Pays d'origine \_\_\_\_\_ Ville d'origine \_\_\_\_\_ Ville où vous habitez \_\_\_\_\_

Profession ☐ Etudiant ☐ Chômeurs ☐ Retraite ☐ Fonctionne. Qu'est-ce? \_\_\_\_\_

Niveau de formation (**termine**)

<input type="checkbox"/> Aucune	<input type="checkbox"/> Lycée	<input type="checkbox"/> Licence	<input type="checkbox"/> Maîtrise
<input type="checkbox"/> Collège	<input type="checkbox"/> Baccalauréat	<input type="checkbox"/> Post-doc	<input type="checkbox"/> Doctorat

Spécialisation \_\_\_\_\_

Merci pour votre contribution et votre temps.

Dans le cas de recherche d'information sur les résultats du sondage et/ou recevoir la thèse envoyer un email avec votre demande pour [inestg88@gmail.com](mailto:inestg88@gmail.com) ou laisser votre adresse e-mail:

\_\_\_\_\_





- German

## Umfrage

Ich bin eine Studentin in der "Faculdade de Ciências da Universidade de Lisboa" und diese Umfrage brauche ich für meine These von Mestrado de Biologia da Conservação. Sie handelt sich um das Potenzial von Beobachtungsaktivitäten von Cetaceen in der zweiten beschützten Seegebiete in Portugal. Seine Teilnahme ist freiwillig und alle Informationen sind anonym und vertraulich. Aber für wissenschaftliche Enden. Nur eine Wahl soll mit X kennengezeichnet werden, bitte. Sie nicht die Umfrage wiederzusehen, um zu garantieren, dass Sie alle Frage beantwortet haben.

**Definition von Cetaceenbeobachtung:** die Messenaktivität, wenn sie sich mit der Gruppieren von Cetaceen (Delphine und Wale) in freier Natur treffen.

- Gibt es diese Aktivität in Ihrem Land? ☐ Ja ☐ Nein ☐ Weiss nicht
- Haben Sie schon dieses erlebt? Wenn ja, **wo**? (Mehr als eine Wahl ist möglich)  
Ja ☐ im Ausland ☐ in meiner Heimat ☐ Nein
- Wünschten Sie diese Aktivität wiedermachen? **Nenn mein, begründen Sie Ihre Meinung, bitte.** (In diesem Fall, antworten Sie ab Frage 12).  
☐ Ja ☐ Nein. Weil \_\_\_\_\_ ☐ Weiss nicht
- Sie machen diese Reise jetzt ( **wählen Sie 3 Hauptgründe auf, bitte**):  

<input type="checkbox"/> Um Cetaceen zu sehen	<input type="checkbox"/> meine Kinder / Freunde wollten sie
<input type="checkbox"/> ich mag Naturreisen	<input type="checkbox"/> jemand hat sie empfohlen
<input type="checkbox"/> ich mag Schiffsreisen	<input type="checkbox"/> sie gehört zu einer Tour
<input type="checkbox"/> Um die Landschaft zu sehen	<input type="checkbox"/> Um etwas über Tiererhaltung zu lernen
<input type="checkbox"/> Zu fotografieren	<input type="checkbox"/> Anders(spezifizieren): _____
- Wieviele würden Sie für diese Aktivität über Cetaceenbeobachtung bezahlen (eine Reise)?  
☐ <€35 ☐ €35-€45 ☐ €46-€55 ☐ €56-€65 ☐ >€65 ☐ Weiss nicht
- Wann finden Sie,würde die beste Zeit für diese Aktivität sein? (mehr als eine Wahl ist möglich).  
☐ Frühling ☐ Sommer ☐ Herbst ☐ Winter ☐ Das ganze Jahr ☐ Weiss nicht
- Wie lange wollten Sie auf der See bleiben?  
☐ <1 Stude ☐ 3 Stude ☐ 5 Stude ☐ 8 Stude ☐ Weiss nicht
- Wieviele Personen , finden Sie, sollte die beste Anzahl, um in einem Schiff zu sein ?  
☐ 4 Personen ☐ 12 Personen ☐ 24 Personen ☐ Weiss nicht
- Wünschten Sie einige Information in der Reise über(mehr als eine Wah ist möglich):  

<input type="checkbox"/> Cetaceenerhaltung in Portugal	<input type="checkbox"/> Die Mitteilung unter Cetaceen
<input type="checkbox"/> Die einzigen Kennzeichen der Cetaceen	<input type="checkbox"/> Die Raubtiere und die Beute von Cetaceen
<input type="checkbox"/> Die Rolle der Cetaceen in dem ökologischen System	<input type="checkbox"/> Andere (spezifizieren): _____

## APPENDIX C

10. Wo würden Sie die Aktivität machen? (mehr als eine Wahl ist möglich).

- |   |  |
|---|--|
| <input type="checkbox"/> Die Insel (Azores und Madeira) | <input type="checkbox"/> In der Nähe von Wohnort |
| <input type="checkbox"/> Norden (Portugal)              | <input type="checkbox"/> Irgendwo in Portugal    |
| <input type="checkbox"/> Zentrum (Portugal)             | <input type="checkbox"/> Aus dem Land            |
| <input type="checkbox"/> Süden (Portugal)               | <input type="checkbox"/> Weiss nicht             |

11. Qual Welche wenigste Anzahl von Reisen sollte ein Betrieb machen (um Cetaceen zu sehen), damit Sie die Aktivität machen würden?

\_\_\_\_\_ % ☐ Weiss nicht ☐ Es ist nicht so wichtig sie zu sehen

12. Möchten Sie andere Tiere ausser Cetaceen sehen?

☐ Ja. Welche? \_\_\_\_\_ ☐ Nein. Weil \_\_\_\_\_ ☐ Weiss nicht

13. Ob es eine Aktivität von Cetaceenbeobachtung wäre, würden Sie, dass diese auch die Beobachtung von Seevögel hätte? ☐ Ja ☐ Nein ☐ Weiss nicht

14. Und in diesem Fall würden Sie einverstanden sein, etwas mehr zu bezahlen, um die Vögel auch zu sehen? Wieviel?

☐ Ja. Mehr € \_\_\_\_\_ ☐ Nein. Weil \_\_\_\_\_ ☐ Weiss nicht

15. Möchten Sie wissen, wie man das Sammeln von wissenschaftlichen Informationen in den Schiffen für Cetaceenbeobachtung macht? ☐ Ja ☐ Nein ☐ Weiss nicht

16. In einer Skala von 1 bis 5, wie Klassifizierten Sie die Wirkung (negativ) dieser Aktivität auf die Tiere?

Nichts ☐ <sup>1</sup> ☐ <sup>2</sup> ☐ <sup>3</sup> ☐ <sup>4</sup> ☐ <sup>5</sup> Viel

17. Falls die negative Wirkung, die diese Aktivität auf die Tiere hätte, sollte man sie nicht weiter machen? ☐ Ja ☐ Nein ☐ Weiss nicht

Alter ☐ 18-24 Jahre ☐ 25-45 Jahre ☐ 46-65 Jahre ☐ >65 Jahre

Gender ☐ Mann ☐ Frau

Nationalität \_\_\_\_\_ Geburtsltadt \_\_\_\_\_ Wohnort \_\_\_\_\_

Beruf ☐ Student ☐ Arbeitslos ☐ Pensioniert ☐ Ander, was? \_\_\_\_\_

Ausbildung (**mit Abschluss**)

☐ Hat nicht ☐ Sekundorschule ☐ Hochschulestudium ☐ Meisterhaft

☐ Grundschule ☐ Drei Jahre Universität ☐ Postgraduierung ☐ Doktorarbeit  
studium

Welche Ausbildung \_\_\_\_\_

Vielen Dank für Ihren Beitrag

Falls Sie etwas über dieser Arbeit Bescheid wünschen und / oder die  
These bekommen, sender Sie ein E-mail nach [inestg88@gmail.com](mailto:inestg88@gmail.com) oder schreiben Sie Ihren E-  
mail:

\_\_\_\_\_

- Spanish

## Cuestionario

Soy alumna de la Facultad de Ciencias de la Universidad de Lisboa (Faculdade de Ciências de la Universidade de Lisboa) y este cuestionario está realizado en el ámbito de mi tesis de Master de Biología de la Conservación y trata sobre la potencialidad de las actividades de observación de cetáceos en las dos Áreas Marinas Protegidas de Portugal. Su participación es voluntaria y la información es anónima y confidencial. Su utilización es para fines científicos. Marque con una **X** una de las opciones en cada pregunta si no se le pidió otra cosa. Por favor, asegúrese de revisar lo cuestionario para asegurarse de que contestó todas las preguntas.

**Definición de la observación de cetáceos:** actividad humana de encuentro con animales del grupo de los cetáceos (delfines y ballenas) en su medio natural.

- ¿Existe este tipo de actividad no país donde reside? ☐ Si ☐ No ☐ No sé
- ¿Ya realizó esta actividad? En caso afirmativo, ¿**dónde**? (Puede elegir más de una opción).  
Si ☐ fuera del país ☐ dentro del país ☐ No
- ¿Le gustaría hacer/repetir esta actividad? (Si la respuesta fuera negativa, justifique su respuesta, por favor y pase enseguida a la pregunta 12).  
☐ Si ☐ No. Porque \_\_\_\_\_ ☐ No sé
- ¿Por qué haría este tipo de actividad? (Escoja las **tres principales razones**).  

<input type="checkbox"/> Ver cetáceos	<input type="checkbox"/> Los hijos/compañeros querían venir
<input type="checkbox"/> Me gustan los viajes por la naturaleza	<input type="checkbox"/> Recomendado por alguien
<input type="checkbox"/> Me gustan los viajes en barco	<input type="checkbox"/> Pertenece a un grupo
<input type="checkbox"/> Para ver el paisaje	<input type="checkbox"/> Para aprender sobre conservación
<input type="checkbox"/> Para hacer fotografías	<input type="checkbox"/> Otro motivo (especificar): _____
- ¿Cuanto pagaría por actividades de observación de cetáceos (un viaje)?  
☐ <€35 ☐ €35-€45 ☐ €46-€55 ☐ €56-€65 ☐ >€65 ☐ No sé
- ¿Qué época del año usted haría la actividad? (puede elegir más de una opción).  
☐ Primavera ☐ Verano ☐ Otoño ☐ Invierno ☐ Todo el año ☐ No sé
- ¿Cuánto tiempo te gustaría estar en el mar? ☐ <1 hora ☐ 3 h ☐ 5 h ☐ 8 h ☐ No sé
- Prefiere un barco con la capacidad máxima ☐ 4 personas ☐ 12 personas ☐ 24 personas ☐ No sé
- Me gustaría tener información en el viaje sobre (puede elegir más de una opción):  

<input type="checkbox"/> Conservación de los cetáceos en Portugal	<input type="checkbox"/> La comunicación de los cetáceos
<input type="checkbox"/> Las características únicas de los cetáceos	<input type="checkbox"/> Depredadores y presas de los cetáceos
<input type="checkbox"/> El papel de los cetáceos en el ecosistema	<input type="checkbox"/> Otro (especificar): _____
- ¿Dónde le gustaría hacer la actividad? (Puede elegir más de una opción)  

<input type="checkbox"/> Islas (Azores y Madeira)	<input type="checkbox"/> Cerca de la zona de residencia en Portugal
<input type="checkbox"/> Zona norte de Portugal	<input type="checkbox"/> En cualquier lugar en Portugal
<input type="checkbox"/> Zona centro de Portugal	<input type="checkbox"/> Fuera do país
<input type="checkbox"/> Zona sur do Portugal	<input type="checkbox"/> No sé

APPENDIX C

11. ¿Cuál es la taxa mínima de avistamiento de cetáceos (número de salidas en que se ve cetáceos) de una empresa que o llevaría a hacer a actividad?

\_\_\_\_\_ % ☐ No sé ☐ No é esencial ve-los

12. ¿Gustaría de ver otros animales además del cetáceos?

☐ Si. Cuáles? \_\_\_\_\_ ☐ No. Porque \_\_\_\_\_ ☐ No sé

13. ¿Si fueres en una actividad de observación de cetáceos, te gustaría que esto se complementase con la observación de aves marinas? ☐ Si ☐ No ☐ No sé

14. ¿Estaría desposto a pagar más se a actividad fose complementada con a observación de aves marinas? Cuanto?

☐ Si. Más € \_\_\_\_\_ ☐ No. Porque \_\_\_\_\_ ☐ No sé

15. ¿Gustaría de aprender como é que se faz colección de dados científicos en la observación de cetáceos? ☐ Si ☐ No ☐ No sé

16. En una escala de 1 a 5, ¿como clasificaría el impacto (negativo) de esta actividad en los animales?

Nada <sup>1</sup>☐ <sup>2</sup>☐ <sup>3</sup>☐ <sup>4</sup>☐ <sup>5</sup>☐ Mucho

17. ¿El impacto negativo que esta actividad podría tener sobre los animales sería un impedimento para hacerlo? ☐ Si ☐ No ☐ No sé

Edad ☐ 18-24 años ☐ 25-45 años ☐ 46-65 años ☐ >65 años

Género ☐ Masculino ☐ Femenino

País de origen \_\_\_\_\_ Ciudad de origen \_\_\_\_\_ Ciudad donde vive \_\_\_\_\_

Profesión ☐ Estudiante ☐ Desempleado ☐ Jubilado ☐ Trabaja en qué? \_\_\_\_\_

Grado de Formación **(completo)**

☐ No tiene ☐ E .secundaria ☐ Licenciatura ☐ Master

☐ E. básica ☐ Bachillerato ☐ Postgrado ☐ Doctorado

Área de Formación \_\_\_\_\_

Muchas gracias por su contribución y tiempo utilizado.

En caso de querer información sobre los resultados del cuestionario y/o recibir la tesis envíe un e-mail con la petición a: [inestg88@gmail.com](mailto:inestg88@gmail.com) ou deje su e-mail:

\_\_\_\_\_