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Environmental attitudes and behaviour of birdwatchers: a missing link

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ABSTRACT
Birdwatching is one of the fastest growing sectors of ecotourism. Managing this nature-based activity requires understanding birdwatchers' attitudes and behaviour towards the natural environment. This paper proposes assessing these attitudes and the link to behavioural intentions by combining the New Environmental Paradigm (NEP) with a criterion-based segmentation method, the chi-squared automatic interaction detector (CHAID). This methodology was applied through a survey questionnaire to birdwatchers in the Ria Formosa Natural Park, a wetland located in South Portugal. The amount birdwatchers were willing to pay for an improvement in the environmental quality of the site, a behavioural intention variable, was used as the criterion in the CHAID analysis. Two birdwatcher segments willing to pay above average were identified and labelled as 'environmental stewards' and 'birdwatching fans'. A key result that emerged from our study is that the NEP score is not a significant predictor of the willingness to pay for environmental improvement in the CHAID analysis. Hence, there is a missing link, as pro-environmental attitudes do not translate into pro-environmental behavioural intentions.

Introduction

A shift in tourist behaviour has been noticed in the recent years towards a higher demand for landscape and wildlife watching (Curtin, 2013; Kronenberg, 2016; Poudel et al., 2017). When it comes to deciding how and where to spend free time, there is an increasing preference for nature activities. Hence, nature and wildlife tourism have been growing around the world (Buckley et al., 2017; Higginbottom & Scott, 2008; Kronenberg, 2016; Vas, 2017). This applies in particular to birdwatching, one of the fastest growing sectors of ecotourism (Czajkowski et al., 2014; Poudel et al., 2017).

Birdwatching is a journey with the aim to detect, identify and observe bird species, either to be in contact with nature and satisfy educational needs or to achieve personal satisfaction (Roig, 2008). It may be undertaken in the context of other forms of tourism, such as agritourism (Shah et al., 2019) and adventure tourism (Xie & Schneider, 2004). As in other forms of nature-based tourism, sustainable management of birdwatching requires the conservation of the natural environment, particularly biodiversity and habitats of nesting birds (Nevard & Nevard, 2014). To this aim, understanding birdwatchers' environmental attitudes

and behavioural characteristics, including their willingness to fund the conservation of birdwatching sites, is of foremost importance.

This study identified three gaps in the tourism literature dedicated to birdwatching that justify the pertinence of the research. First, research on the environmental attitudes of birdwatchers is rather recent and scarce, particularly in South European countries, as concluded by Steven et al. (2015). These authors also found, in a global review of birdwatching research, that out of the 66 studies examined, only in five were birdwatchers/operators asked about attitudes toward conservation. The scant literature on birdwatchers' environmental attitudes points to the New Environmental Paradigm (NEP) scale, developed by Dunlap and Van Liere (1978), as one of the main instruments to measure attitudes towards the environment. For instance, Glowinski and Moore (2014) used it to assess birdwatchers' environmental attitudes in the southern United States. More recently, through a survey, Chow et al. (2019) applied the NEP Scale to visitors to a birdwatching site in South China.

Sustainable birdwatching management requires not only understanding the environmental attitudes of

birdwatchers but also whether these attitudes translate into pro-environmental behaviour (Cheung et al., 2017). However, this link between environmental attitudes of birdwatchers and pro-environmental behaviour is largely underexplored, representing the second research gap. The recent studies by Weston et al. (2015) and Cheung et al. (2017) are notable exceptions. Moreover, mechanisms to fund protected areas, such as natural parks, are a research priority (Eagles, 2014) and are still understudied, representing the third research gap.

From these research gaps emerge the three objectives of our study. First, it aims to provide a characterization of the environmental attitudes of birdwatchers in a South European country, using the NEP, one of the main scales for measuring environmental attitudes adopted in previous studies. Second, it aims to assess the link between environmental attitudes and pro-environmental behavioural intentions of birdwatchers by combining a criterion-based segmentation method – the chi-squared automatic interaction detector (CHAID) – with the NEP Scale. This methodology is novel as previous studies on the topic have adopted different methods – a general linear model (Weston et al., 2015) or a structural equation model (Cheung et al., 2017). Third, this study intends to increase the knowledge on how to fund protected areas by asking birdwatchers about their willingness to pay for an improvement in the quality of the site, and characterizing the segments more likely to adopt this pro-environmental behaviour. Combining the CHAID and the NEP Scale not only allows the second research objective to be attained, but also contributes to achieve the third objective. By segmenting birdwatchers, it enables a better understanding of the characteristics of those more prone to adopt pro-environmental behaviour.

In order to address these objectives, this study applied a questionnaire survey to the birdwatchers visiting the Ria Formosa Natural Park (RFNP), a wetland located in South Portugal. Three main research questions were formulated:

Q1: What characterizes the environmental attitudes of birdwatchers in the RFNP?

Q2: Is there a link between their environmental attitudes and willingness to pay for an improvement in the quality of the site, a pro-environmental behavioural intention?

Q3: To what extent is the birdwatching activity able to contribute to fund the protected area, i.e. what percentage of birdwatchers is willing to contribute to the improvement of the site? How much would they be willing to pay? And what are the characteristics of segments with a higher willingness to contribute?

Literature review

Environmental and economic impacts of birdwatching

The increasing popularity of birdwatching in local development planning is related to its environmentally friendly characteristics, along with the economic advantages for local communities. The environmentally friendly characteristics are supported by several studies. Green and Jones (2010), through a survey of birdwatchers in Australia, concluded that most respondents were concerned about conservation issues, such as avoiding the disturbance of nesting birds. Also in Australia, Nevard and Nevard (2014) showed how tourism, and in particular birdwatching tourism, supports conservation in the Mareeba Wetlands Reserve, Queensland. By surveying birdwatchers in the Azores Archipelago (Portugal), Guimarães et al. (2015) found that birdwatchers care more about biodiversity and habitat quality than birdwatching infrastructures. Kronenberg (2016), undertook a SWOT (strengths, weaknesses, opportunities, threats) analysis on the development of birdwatching in Poland, based on the survey results of three groups involved with birdwatching (international tour operators, international researchers, and Polish researchers). The author concludes that the most important strength of Poland as a birdwatching destination is its abundance of bird species and natural unspoilt ecosystems. Environmental degradation was found as the main threat.

The economic benefits for locals are confirmed by several studies, as tourists' expenditure contribute directly to generating employment locally. Based on a survey of the visitors to a popular birdwatching site in Australia, the O'Reilly's/Green Mountains, located in the Lamington National Park, Tisdell and Wilson (2004) computed the impact on the local economy and rated it as very high. Through an input-output analysis, Poudel et al. (2017) found that non-consumptive wildlife watching makes a significant economic contribution in the US South, both in terms of employment and value added.

When it comes to conservation issues, many authors argue that wildlife tourism activities, such as birdwatching, are important for the long-term conservation of both species and habitats (Buckley, 2002; Buckley et al., 2017; Guimarães et al., 2015; Nevard & Nevard, 2014). A well-designed product with a good management plan can protect species, contribute to conservation and change visitors' attitudes (Ballantyne et al., 2009; Nevard & Nevard, 2014).

Although birdwatching has generally been advocated as an activity that contributes to nature conservation,

some studies have reported negative impacts, especially when birdwatching is practised in very sensitive habitats or involves threatened species. Green and Jones (2010) report impacts on the birds being observed and on other species in the surrounding areas. Reported negative impacts on bird populations have been related to breeding, feeding, population levels and distribution (Jackson, 2007). Recently, Bateman and Fleming (2017) undertook a meta-analysis of empirical studies of wildlife responses to tourism activities in natural areas. Their analysis suggests that the negative impacts of tourism activities on wildlife are often over-reported, as some species show the capacity to adapt to tourism disturbances even in the short term.

Birdwatcher profile

Visitors' preferred recreational activities are determined by their psychographic tendencies (Merritt et al., 2016). Those who select birdwatching activities have been characterized as a diverse group in terms of socio-economic characteristics, motivations and preferences (Eubanks et al., 2004; Lee et al., 2010). Several authors have proposed the categorization of birdwatchers according to different features. Wright (1995) identified two main groups in the north Norfolk coast area, UK: 'birders' and 'twitchers'. They differed regarding their place of residence and level of commitment to birdwatching. 'Birders' were described as local people with a low commitment level, whereas 'twitchers' travelled long distances and showed a high commitment to record their 'spots'. Later, Jones and Buckley (2001) took into account the motivations and the willingness to pay of birdwatchers and distinguished four categories: general birdwatchers, specialist birdwatchers with restricted budgets, specialist birdwatchers willing to pay to see birds, and specialist birdwatchers requiring birding tour packages offered by specialized birding travel enterprises.

Despite other categorizations proposed (e.g. Hvenegaard, 2002), the classification of birdwatchers into 'birders' and 'twitchers' has become standard (Connell, 2009). 'Birders' are less specialized, and their main motivation is the contact with nature. For them, birdwatching is a complementary activity. The majority of birdwatchers are included in this group. 'Twitchers' are more engaged in the activity. They have birds as their primary motivation, and the observation of birds is the reason for their travel. Destinations are chosen on the basis of the species that can be seen there. Their bird knowledge is above average, and they can be competitive, sometimes having a degree of a hierarchical social structure. Recently, Vas (2017) analysed 200 birding

blogs and concluded that birdwatching is a multidimensional activity, which requires strategic planning of birdwatching destinations to offer complete tourist experiences.

With regard to the socio-economic characteristics of birdwatchers, studies report high education and income levels, as well as high environmental consciousness (e.g. Connell, 2009; Eubanks et al., 2004; Guimarães et al., 2015). Contrary to consumptive nature activities, such as fishing and hunting, birdwatching is characterized by a fairly equal participation of women and men (e.g. Eubanks et al., 2004; Lee et al., 2010). However, Moore et al. (2008) observed significant gender differences in specialization level, commitment and motivation to practise birdwatching.

Environmental attitudes and behaviour of birdwatchers

Environmental attitudes are psychological tendencies expressed in the way individuals evaluate the environment in a favourable or unfavourable manner (Hawcroft & Milfont, 2010). The environmental attitudes of tourists have received significant academic attention in the last two decades, particularly the socio-demographic and psychological factors behind tourists' environmental attitudes (e.g. Chen et al., 2017; Chiu et al., 2014; Halpenny, 2010; Kerstetter et al., 2004; Mehmetoglu, 2010; Miller et al., 2015; Valle et al., 2012). According to the literature reviews undertaken by Dolnicar (2010) and Kiatkawsin and Han (2017), the most common socio-demographic factors used as predictors of pro-environmental attitudes are age, gender, education, income and political orientation; personal values, personal norms and environmental awareness are the main psychological determinants.

According to Steven et al. (2015) the literature on the environmental/conservation attitudes of birdwatchers is still scarce. These authors highlighted that further research is required to address how the conservation of species and habitats are important for birdwatching tourists. Moreover, given that birdwatching tourism research is currently regionally biased with a focus on North America, they also suggested that research should address other regions.

Herein, we approach the literature on the environmental/conservation attitudes of birdwatchers and organize it based on the studies' methodology. A questionnaire survey of birdwatchers followed by descriptive statistics is a simple method with which to assess the environmental attitudes of birdwatchers. Following this approach, Green and Jones (2010) concluded that birdwatchers in Australia showed a high

level of concern for wildlife in general, a dislike for hunting, and avoidance of disturbing nesting birds. Moreover, the majority of birdwatchers either attended meetings on bird conservation or belonged to conservation organizations.

The combination of the NEP Scale with a structural equation model led Glowinski and Moore (2014) to conclude that the level of participation in birding may not influence environmental attitudes. Vas (2017) reached a different conclusion by analysing birding blogs of five English-speaking countries through a mixed-methods approach, including content analysis and word frequencies. The author found that more advanced birders are less concerned with conservation. A multiple regression with the NEP Scale as the dependent variable is another method adopted in the literature. Through this method, it has been shown, with nature-based visitors to the Ramsar wetland in South China, that ecologically responsible attitudes are positively correlated with self-determined travel motivations (Chow et al., 2019).

Thus, environmental attitudes of birdwatchers have been addressed through a variety of methods, including descriptive statistics, mixed-methods based on birding blogs, and the combination of the NEP Scale with structural equation modelling and with regression models. The conclusions indicate that birdwatchers tend to be concerned with nature conservation, and their pro-environmental attitudes are positively related to self-determined travel motivations. It has been found that birding practice has a nil or negative impact on pro-environmental attitudes.

Besides attitudes, literature on the behavioural intentions of birdwatchers, in the form of willingness to pay for environmental attributes, has also emerged recently. This topic has been studied based on two methodological approaches. The first approach is a factor analysis under a push–pull motivation framework. This was adopted by Chen and Chen (2015) to study the travel behaviour of international birders in Taiwan, where bird density is one of the highest in the world. They examined the internal motives that lead birdwatchers to take international birding trips (push factors) and the destination attributes that attract them (pull factors). The authors concluded that 'contribution and sharing' (a motivation category related to willingness to contribute to wildlife conservation) is an important push factor for international birders who visit Taiwan.

The second approach is the application of non-market valuation methods, which are widely used in the field of environmental economics. These methods allow the evaluation in monetary terms of goods and services that are non-traded in markets. Examples include services provided by the environment, such as landscapes, birdwatching and other recreational activities. One of the classical non-market valuation methods is the travel cost. This method was applied by Kolstoe and Cameron (2017) to assess birdwatchers' willingness to pay for birding site attributes. Through an application to birding sites in the states of Washington and Oregon (USA), the authors measure how total willingness to pay for a birding site depends on environmental attributes, such as species richness, presence of endangered species and the ecological management regime.

A choice experiment survey is another non-market valuation method adopted to measure birdwatchers' willingness to pay for environmental attributes. This method was applied by Steven et al. (2017) in popular Australian and UK birdwatching sites. The goal was to compute birdwatchers' willingness to pay for different levels of bioecological attributes: the number of endemic species, the number of threatened species, and the diversity of birds. In order to obtain monetary values for the different levels of the three attributes, a payment attribute was included in the form of a hypothetical entry fee. The results showed that birdwatchers were willing to pay significant amounts to access birding sites that offered their preferred combination of attributes. Moreover, through a latent-class model, four birdwatcher segments could be identified.

The literature on the behavioural intentions of birdwatchers, in the form of willingness to pay for environmental attributes is scarce. Nonetheless, two key results can be highlighted. First, it has been shown, through a push–pull motivation framework, that contribution to wildlife conservation can be a relevant push factor in motivating birdwatchers to visit a site. Second, the application of non-market valuation methods, borrowed from environmental economics, has shown that birdwatchers tend to have a high willingness to pay for environmental attributes.

Is there a link between the environmental attitudes of birdwatchers and pro-environmental behaviours? A positive link indicating that pro-environmental attitudes are predictors of pro-environmental behaviours has been found by Weston et al. (2015) among Australian birdwatchers and by Cheung et al. (2017) among Chinese birdwatchers. The former tested the link using a general linear model (GLM), whereas the latter used a structural equation model. The link between environmental attitudes and environmental behaviour is in accordance with to the theory of planned behaviour, reviewed by Ajzen (1991). This theory postulates that a

behavioural intention can be predicted with a high level of accuracy based on attitudes towards that behaviour, subjective norms and perceived behavioural control.

The literature on various scientific fields, such as environmental psychology (e.g. Fransson & Gärling, 1999; Tanner, 1999) and consumer behaviour (e.g. Minton & Rose, 1997; Schlegelmilch, 1996) has, however, reported abundant cases in which the link between environmental attitudes and environmental behaviour is absent. The 'missing link' is also present in the tourism literature. Wearing et al. (2002) found in a study on international backpackers in Australia that the relationship between environmental attitudes, intention and behaviour is fragile and poses an important challenge to ecotourism.

To sum up, the literature on the environmental attitudes of birdwatchers is still meagre. In particular, many geographical areas worldwide have not been covered. The link between environmental attitudes and pro-environmental behaviour is explored even less. This topic provides avenues for further research, namely through the adoption of new methodologies.

The NEP Scale

A large number of measures of environmental attitudes have been developed since the 1960s (Dunlap & Jones, 2002). According to Dunlap and Jones (2003), three have come to be widely used. These are the Ecology Scale (Maloney et al., 1975; Maloney & Ward, 1973), the Environmental Concern Scale (Weigel & Weigel, 1978), and the NEP (Dunlap & Van Liere, 1978). The first two scales, by the nature of the items included, in a context in which the main environmental concerns were air and water pollution, resource exploitation, wildlife preservation, and so forth, received more use during the 1980s. The latter scale, by including items that reflected the growing awareness that humans were potentially disrupting the global ecosystem with unknown but potentially huge repercussions has been the most widely used since the 1990s (Dunlap, 2008).

The original NEP Scale was developed by Dunlap and Van Liere (1978), using 12 items and addressing three dimensions: balance of nature, dominance over nature and limits to growth. Dunlap et al. (2000) presented a revised version of the NEP Scale, a 15-item scale termed by the authors as the New Ecological Paradigm scale. A detailed analysis of the history and characteristics of the NEP Scale can be found in Dunlap (2008).

The first application of the NEP Scale to tourism was by Uysal et al. (1994), who examined the relation between environmental attitudes, visitor demographic characteristics and trip behaviour in the US Virgin Islands National Park. Thereafter, the NEP Scale has been widely used to assess the environmental attitudes of tourists (e.g. Luo & Deng, 2008; Lück, 2000; Minoli et al., 2018). Zografos and Allcroft (2007) take an innovative approach by undertaking a segmentation analysis based on the results of the NEP Scale from a survey to visitors to a natural site in Scotland. Through a factor and cluster analysis, the authors showed that environmental values can be used to segment visitors. As shown in the previous section, recently the NEP Scale has also been adopted to analyse the environmental attitudes of birdwatchers (Chow et al., 2019; Glowinski & Moore, 2014).

CHAID analysis in tourism studies

Developed by Kass (1980), CHAID is a database segmentation method, which splits the observations into subgroups or segments that differ significantly in terms of a designated dependent (or criterion) variable. It eliminates non-significant variables from the analysis and helps to understand the hierarchy of the variables associated to the dependent variable. The use of CHAID in marketing studies is frequent, but in tourism studies it is still underexplored (Ceylan et al., 2020).

Dolnicar (2005) pointed out that only 3% of segmentation studies in tourism employed CHAID. Chunga et al. (2004), one of the earliest applications of the technique to tourism, compared different methods for segmenting hotel customers regarding their preferred restaurant type (hotel or casual-dining restaurant). The authors concluded that the CHAID analysis could be useful for detecting the most important factors in forming the segments, particularly demographic and behavioural characteristics. In Díaz-Pérez et al. (2005), CHAID was used to segment the Canary Islands' tourism market based on expenditure. Later, Legohérel and Wong (2006) and Hsu and Kang (2007) used the method to segment tourists based on their expenditure patterns and likelihood to return to a destination, respectively. Both studies considered tourists' socio-demographic characteristics and trip-related variables as predictors. Repeated visiting and/or recommendation were also considered as dependent variables in the CHAID applications by Vassiliadis (2008) and Agapito et al. (2011).

The topic of willingness to pay for a tax for environmental protection was the criterion variable in the study by Valle et al. (2012), considering as predictors socio-demographic variables and behavioural characteristics. More recently, Legoherel et al. (2015) used the method to segment travellers considering their preferences regarding hotel and restaurant selection as the criterion variable. In Díaz–Pérez and Bethencourt–Cejas

(2016), tourist's expenditure in the destination was used as the criterion variable. Finally, Ceylan et al. (2020) segment tourists based on their destination image perceptions.

Methodology

Study site

Our study was undertaken at the Ria Formosa Natural Park (RFNP), in a birdwatching trail designated as 'Quinta de Marim'. Located on the southeast coast of the Algarve, Portugal (Figure 1), this natural park is one of the most important wetlands in Europe (Ceia et al., 2010). It was created in 1987 to protect a lagoon system, its fauna, flora and habitats. The protected area covers around 18,400 ha and its climate is of the Mediterranean type, with dry summers and mild winters.

The RFNP is characterized by a lagoon separated from the Atlantic Ocean by sand islands – Barreta, Culatra, Armona, Tavira and Cabanas – and two peninsulas, Ancão and Cacela (Figure 1). On the border of the park, there are three important cities: Faro, capital of the Algarve, Olhão and Tavira. There are also holiday resorts, such as Quinta do Lago, and villages like Fuseta, Cabanas and Cacela Velha, which live mainly from tourism and fishing.

With respect to the economic dimension, the RFNP supports many activities, such as fishing, aquaculture, shipping, tourism, salt production and sediment extraction (Ribeiro et al., 2008). Considered as one of the natural wonders of Portugal, the park is a wetland rich in biodiversity, recognized as a Special Protection Area for Birds, Natura 2000, Ramsar Site and Important Bird Area (IBA). It has an extensive variety of bird species, especially from the orders Gaviiformes, Podicipediformes, Anseriformes, Gruiformes and Charadriiformes. The RFNP is also an important breeding place. Bird species breeding inside the limits of the protected area include: azure-winged magpies, avocets, bee-eaters, black-winged stilts, collared pratincoles, great reed warblers, Kentish plovers, little bitterns, little terns, night herons, purple gallinules (the symbol of the park) and several species of grebes and ducks (Vowles & Vowles, 1994). Two globally threatened species are present in the RFNP: *Aythya nyroca* and *Larus audouinni*. The latter breeds in the park. Moreover, the RFNP is also an important spot for migratory species (Ceia et al., 2010).

Questionnaire survey

A questionnaire was designed to collect data from birdwatchers in the RFNP, required to answer the three research questions. Taking into account that people were in their leisure time, the questionnaire was short and could be filled out in less than ten minutes. It started with a brief explanation, informing respondents that it was part of a study for a master's dissertation and that participants' answers were confidential and to be used only for scientific purposes. Questions were both multiple choice and open-ended and were divided into four major groups: i) birdwatching experience in the Ria Formosa Natural Park; ii) birdwatching background; iii) environmental attitudes; iv) and socio-economic information.

The first group of questions aimed to assess the respondents' birdwatching experience in the RFNP. For that purpose, respondents were asked, among other things, whether it was their first visit to the park and whether birdwatching was the main reason for the visit (e.g. Veisten et al., 2014). Questions about satisfaction (e.g. Buckley et al., 2017), intention to return and willingness to recommend the park to friends and family (e.g. Lee et al., 2009) were also part of the first group. Then they were asked about their willingness to pay an entrance fee to improve birdwatching facilities and hence the environmental quality of the site. The following scenario was posed:

Suppose a fund were to be raised to improve birdwatching facilities in the Ria Formosa Natural Park. This would include:

- *More and improved observatories;*
- *Information panels and travel guides;*
- *Availability of binoculars and field guides.*

Assume that this fund would be financed by collecting an entrance fee to Quinta de Marim (this trail). Would you be willing to pay a fee? If Yes, what is the maximum amount you would pay?

This scenario was designed as a key element to achieve research objectives two and three. Establishing a hypothetical improvement in environmental quality, and asking birdwatchers about their willingness to pay for it, contributes to assessing the link between environmental attitudes and pro-environmental behaviour (objective two). It also enables the knowledge on how to fund protected areas to be increased and to characterize the segments most likely to adopt pro-environmental behaviour (objective three).

The change in environmental quality was based on the assessment of the park's birdwatching facilities. The assessment was undertaken based on three sources. First, direct observation, through visits to the birdwatching hotspots of the park. Second, information provided by park employees at the entrance to the trail,
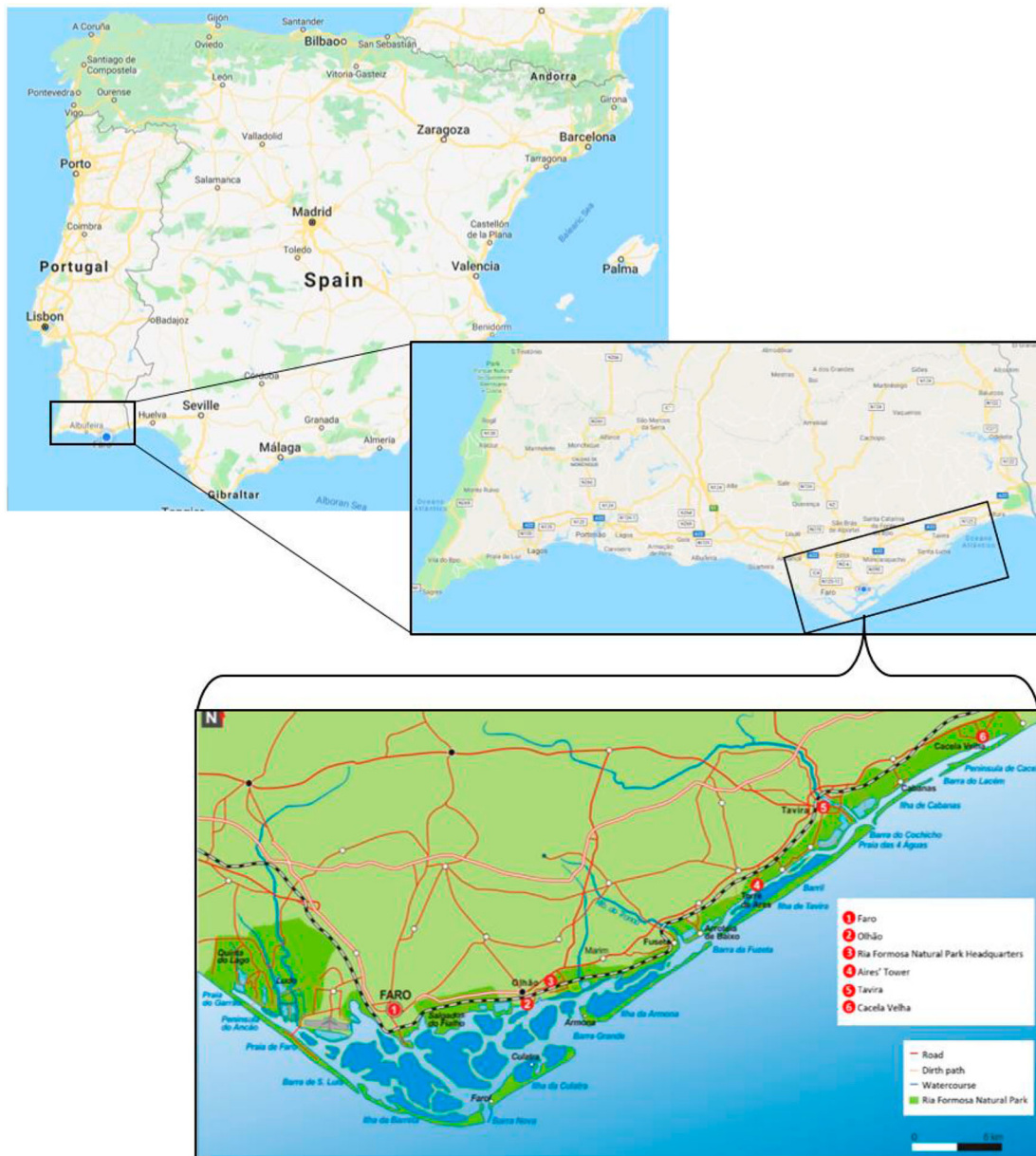
Figure 1. Location of the Ria Formosa Natural Park. Source: Adapted from Google maps and ICNF (2015).

through unstructured interviews. Third, a pre-test applied during five days in October 2014, during which answers to 12 questionnaires were collected. As a result of the pre-test, changes were made to some questions. In particular, in the scenario question, the expression '(*this trail)'* was added after *'Quinta de Marim'* (see above), as some birdwatchers did not recognize the place by its name.

The scenario sets a change in environmental quality, a standard procedure to measure the willingness to pay for non-market goods and services. This is widely used in environmental economics, as a way to estimate the economic value of hypothetical changes in environmental quality (e.g. Hanley et al., 2019). This

methodological procedure has also been adopted in tourism studies (e.g. Lee et al., 2010; Oliveira et al., 2017)

In the second group of questions, respondents were asked about habits related to birdwatching in order to understand their level of commitment to the activity (e.g. in Green & Jones, 2010; Moore et al., 2008). Questions like those related to the use of special equipment (e.g. bird field guide or telescope) and the number of days dedicated to this activity per year were posed.

The third group was dedicated to the assessment of environmental attitudes through the NEP Scale. We adopted the original NEP Scale, a 12-item scale using Likert-type responses (Dunlap, 2008), which includes items related to the balance of nature, limits to

growth, and human dominance over nature. The original scale had the advantage of having been extensively applied, opening up the possibility of comparative analysis with previous studies. Moreover, according to Jackson (2007), the revised versions of the NEP Scale do not offer major advantages over the original one.

The last group of questions focused on socio-economic characteristics (e.g. Chiu et al., 2014; Chow et al., 2019), such as nationality, gender, age, education level and monthly household income. These variables were essential to set the general profile of birdwatchers as well as their segmentation.

The questionnaire was available in four different languages: English, Portuguese, Spanish and Dutch. A pre-test was undertaken to validate the questions posed as well as the answer scales. Following the pre-test, the questionnaire was applied between November 2014 and April 2015 in order to include bird migration periods. During these months, the questionnaire was applied *in situ* on different days of the week and at different hours to allow the inclusion of individuals with diversified profiles and habits (Tisdell & Wilson, 2004).

Sampling

In order to select the sample of birdwatchers, a cluster sampling method was applied. This method is adequate when homogeneous groups (clusters) of individuals can be identified in a population (Newbold et al., 2019). It consists of selecting one or more clusters through simple random sampling and then studying all or part of the elements of those clusters. In the case of birdwatching in the RFNP, seven birdwatching hotspots have been identified (Algarve Tourism Board, 2018). From this set of clusters, one cluster was randomly selected: the 'Quinta de Marim' trail. Within the 'Quinta de Marim' there is an environmental interpretative centre called the Wildlife Rescue and Investigation Centre (RIAS). The RIAS was considered the appropriate place to apply the questionnaire, as visitors stop there to rest and to see an exhibition. Moreover, it is located in the middle section of the 'Quinta de Marim' trail, allowing visitors to experience the site before arriving there. After being given an explanation about the purpose of the study, each visitor was asked: Is birdwatching one of the reasons for your visit to this site? The questionnaire was only given to those who answered positively to this question. In this way, only birdwatchers were selected. With regard to age, visitors under 18 years of age were excluded.

The study included all types of birdwatchers, from experienced ones to the general visitor who happens to try a bit of birdwatching. From the data collection process, a total of 203 answered questionnaires was obtained. Out of these, 18 were excluded because they were incomplete. Hence, a total of 185 valid questionnaires was obtained, corresponding to 91.1% of the initial collected data. Taking into account that data were collected in the low season of the touristic activity in the Algarve, a typical sun and beach destination, and that birdwatching is still today an emergent tourism product, a data set of 185 participants was considered reasonable. This sample size ensures a maximum margin of error of 7.2% for a 95% confidence interval on a population proportion, assuming the most conservative estimate for a sample proportion (0.5) and that the size of the target population is unknown (Newbold et al., 2019). In other words, the sample size guarantees a reasonable margin of error in statistical inference. Moreover, it is close to the sample sizes of other studies on the environmental attitudes and behaviour of birdwatchers: 179 in Weston et al. (2015), 257 in Chen and Chen (2015), and 283 in Steven et al. (2017).

Data analysis

The data collected from the survey were analysed using SPSS Statistics 21 software. Frequency distributions were used to characterize the birdwatcher profiles in terms of socio-demographic aspects and birdwatching practices. Moreover, for each of the 12 items of the NEP Scale, the distribution of answers was computed together with the median and mean score. A global mean NEP score was also obtained for the whole sample, as in Lück (2003). These analyses will allow us to respond to the first research question proposed for this study. A high NEP score indicates pro-environmental orientation, beliefs and attitudes (Dunlap et al., 2000).

As in Zografos and Allcroft (2007), we also combined the NEP Scale with a segmentation analysis. However, a different approach was taken by adopting a criterion-based segmentation method: the chi-squared automatic interaction detector (CHAID). CHAID is able to identify the main variables that significantly discriminate among segments and is easy to interpret, as the results are shown in the form of a segmentation tree (Legohérel & Wong, 2006). The CHAID is based on chi-squared tests of independence between the dependent variable and the potential predictors. When the null hypothesis of independence is rejected for a particular predictor variable, that variable is selected for the CHAID analysis.

CHAID splits the entire data successively into nodes. The first split is undertaken through the predictor

variable that best discriminates the dependent variable (Kim et al., 2011). Then, each node is split into new nodes based on the variable that best discriminates its elements. The process ends when no more significant dependence relationships can be found. As the CHAID divides the root node (node 0) into branches, it is frequently called 'tree analysis'. The final nodes represent distinct segments.

The CHAID allows for the detection of the variables that significantly differentiate the segments, as well as their importance in the segmentation process. This method can also be used to predict the category of the dependent variable for a given statistical unit (a birdwatcher in our study) based on the values of the predictor variables.

In our study on birdwatching in the RFNP, the segmentation criterion, or dependent variable, was the amount birdwatchers were willing to pay to improve birdwatching facilities and hence the environmental quality of the site. The potential predictors were the environmental attitudes (measured by the mean NEP Score), birdwatching characteristics (birdwatchers' background and experience in the RFNP) and socio-demographic attributes, as described in the subsection *Questionnaire survey*.

As in Díaz-Pérez and Bethencourt-Cejas (2016) and Díaz-Pérez et al. (2005), classes for the dependent variable (willingness to pay) were established by using the average value of the variable as the cutting point. Following Oliveira et al. (2017) and in Valle et al. (2012), the proportion of correctly classified statistical units through the CHAID was used for validation purposes.

Including environmental attitudes as a potential predictor of the willingness to pay to improve environmental quality on the site, the CHAID analysis allows assessing a possible link between environmental attitudes and a behavioural intention and thus responds to research question 2. Moreover, the segmentation provided by this method, based on the willingness to pay criterion, provides relevant information regarding the funding of protected areas, and therefore, contributes to answering research question 3.

Results

This section is divided into four parts. The first presents the socio-economic characteristics of the respondents. The second addresses their birdwatching background and practices in the Ria Formosa Natural Park. The third focuses on their environmental attitudes, measured via the NEP Scale. Finally, the fourth shows the outcomes of the CHAID analysis.

Socio-economic characteristics

Table 1 contains the key socio-economic characteristics of the participating birdwatchers. The most frequent nationalities were British (39.1%) and Dutch (17.4%), followed by Portuguese (16.8%). Respondents were almost equally distributed by gender (54.9% male), their average age was around 50 years old, and the majority were married or lived together with a companion (56.8%). A significant proportion did not have children (46%). The level of education was high, with 73.7% having a university degree. Regarding professional status, the most common was retired (41%), followed by employed in the public sector and employed in the private sector (both representing 18.5%). Regarding individual net monthly income, the most frequent class was €1001 to €2000 (35%) and around 17% earned more

Table 1. Socio-demographic characteristics of the sample.

Variables	Valid n	%
Nationality	184	100%
British	72	39.1%
Dutch	32	17.4%
Portuguese	31	16.8%
Belgium	11	6.0%
Spanish	11	6.0%
German	9	4.9%
Other	8	9.8%
Gender	184	100%
Male	101	54.9%
Female	*83*	45.1%
Age (Mean = 49.7; Std. dev. = 16.7)	159	100%
18–35	44	27.7%
36–64	80	50.3%
>64	35	22.0%
Marital status	168	100%
Married/Living Together	95	56.5%
Single	53	31.5%
Divorced	4	2.4%
Widowed	6	3.6%
Other	10	6%
Number of children?	174	100%
None	80	46.0%
One	12	6.9%
Two	61	35.1%
Three	15	8.6%
Four or more	6	3.4%
Educational qualification	179	100%
Basic School	6	3.4%
High School	27	15.1%
BSc Degree	79	44.1%
Master Degree	41	22.9%
PhD	12	6.7%
Other	14	7.8%
Professional status	178	100%
Entrepreneur	17	9.6%
Employed in the Public Sector:	33	18.5%
Employed in the Private Sector:	33	18.5%
Retired	73	41.0%
Student	15	8.4%
Individual net monthly income	163	100%
Until €1000	45	27.6%
€1001 – €2000	57	35.0%
€2001 – €3000	33	20.3%
€3001 – €4000	14	8.6%
>€4001	14	8.6%

than €3000. The median value for the individual monthly income was €1640.

Birdwatching background

Most respondents (56.3%) practised birdwatching 1 to 30 days per year (Table 2). The majority practised it during vacations (85.4%) and had specialist birdwatching gear (70.3%). In particular, 91% had specialist binoculars, 79% had bird field guides and 33.1% had a special camera. The majority considered themselves to have an average knowledge of birds (50.8%), and 35.1% considered their knowledge to be above average.

Table 2 also shows that most respondents were members of nature conservation organizations (62.7%). These include Portuguese organisations, such as ALDEIA and SPEA, and organizations based in other countries, such as the Wildfowl & Wetland Trust (UK), the Royal Society for the Protection of Birds (UK), the Vogelbescherming (NL) and the Natuurmonumenten (NL).

Birdwatching in the Ria Formosa Natural Park

Table 3 shows that most respondents were on vacation in the Algarve (81.1%). The average length of their stay in the region was 14 days, and they mostly travelled with family (62%) or friends (31.5%). The majority were visiting the Ria Formosa Natural Park for the first time (61.6%). For most respondents (70%), birdwatching was the main reason for visiting the park. Among other reasons were nature (9%), walking (4%), professional/study (3%) and wildlife (2%).

The respondents classified positively their overall birdwatching experience in 'Quinta de Marim' (87.6% referred to being satisfied or very satisfied), with 79.8%

expressing an intention to return and 98.9% a willingness to recommend the place to family and friends. Most interviewed birdwatchers had already done or intended to do birdwatching in other places in the Algarve (60%), meaning that they were willing to visit other birdwatching sites in the region.

Birdwatchers' environmental attitudes

The NEP was used to assess birdwatchers' environmental attitudes, thus responding to the first research question proposed for this study. The original 12-item NEP Scale was adopted, as in Jackson (2007), with each item being measured on a Likert-type 5-point scale (1 = completely disagree and 5 = completely agree). Agreement with items 3, 4, 6 and 10 (shown in shadow in Table 4) indicates anti-environmental responses, whereas agreement with the other items shows pro-environmental responses.

To assess the internal consistency of the 12-item NEP Scale, Cronbach's alpha was computed. The result of this coefficient was 0.71. A value of at least 0.8 would indicate a very good level of internal consistency (Hulin

Table 2. Birdwatching background.

Variables	Valid n	%
How many days per year do you do birdwatching on average?	167	100%
01–30 days	94	56.3%
31–90 days:	23	13.8%
91–140 days	9	5.4%
>140 days	41	24.6%
When you travel on vacation do you do birdwatching?	185	100%
Yes	158	85.4%
No	27	14.6%
Do you have specialist birdwatching gear?	185	100%
Yes	130	70.3%
No	55	29.7%
Do you consider your knowledge of birds to be:	185	100%
Below average	26	14.1%
Average	94	50.8%
Above average	65	35.1%
Are you a member of any nature conservation organisation?	185	100%
Yes	116	62.7%
No	69	37.3%

Table 3. Birdwatching in the Ria Formosa Natural Park.

Variables	Valid n	%
Are you on vacation in the Algarve?	185	100%
Yes	150	81.1%
No	35	18.9%
If Yes, what is the duration (in days) of your stay?	120	100%
1–7 days	64	53.3%
8–15 days	38	31.7%
16–21 days	9	7.5%
22 or more days	9	7.5%
Who are you travelling with?	184	100%
Alone	9	4.9%
Family	114	62.0%
Friends	58	31.5%
Other	14	7.6%
Is this your first time in this park?	185	100%
Yes	114	61.6%
No	71	38.4%
Is birdwatching the main reason for you to visit this park?	185	100%
Yes	124	70.0%
No	61	30.0%
Classify your overall satisfaction with the birdwatching experience in this park:	185	100%
Very unsatisfied	6	3.2%
Unsatisfied	3	1.6%
Not satisfied nor unsatisfied	14	7.6%
Satisfied	110	59.5%
Very satisfied	52	28.1%
Do you intend to return to birdwatch in this park in the future?	178	100%
Yes	142	79.8%
No	36	20.2%
Would you recommend this park for birdwatching to your friends and family?	185	100%
Yes	183	98.9%
No	2	1.1%
Have you ever done (do you intend to do) birdwatching at other sites in the Algarve?	185	100%
Yes	111	60.0%
No	74	40.0%

Table 4. Distribution of the NEP scale items* (frequencies are shown in percentage).

	(1)	(2)	(3)	(4)	(5)	Median	Mean / Std. Dev.
1. The Earth is approaching the limit number of people it can support.	1.1	14.5	10.6	**36.9**	36.9	4	3.94 / 1.08
2. The balance of nature is very delicate and easily upset.	0.0	2.2	1.6	40.2	**56.0**	5	4.5 / 0.64
3. People have the right to modify the natural environment to suit their needs. **	20.7	**55.7**	11.5	10.9	1.1	2 (4)	2.16 / 0.92 (3.84)
4. People were created to rule over the rest of nature. **	**58.7**	32.1	4.3	3.8	1.1	1 (5)	1.57 / 0.83 (4.43)
5. When people interfere with nature it often produces disastrous consequences.	4.9	4.9	2.7	**45.4**	42.1	4	4.15 / 1.04
6. Plants and animals exist primarily to be used by people. **	**48.9**	40.2	6.0	4.3	0.5	2 (4)	1.67 / 0.82 (4.33)
7. To maintain a healthy economic situation we will have to develop a 'steady state' economy where industrial growth is controlled.	2.7	7.7	3.8	**55.5**	30.2	4	4.03 / 0.95
8. People must live in harmony with nature in order to survive.	2.2	1.6	1.6	28.4	**66.1**	5	4.55 / 0.83
9. The Earth is like a spaceship with only limited room and resources.	2.8	2.2	6.1	41.1	**47.8**	4	4.29 / 0.89
10. People need not adapt to the natural environment because they can remake it to suit their needs. **	**45.3**	35.9	8.3	7.7	2.8	2 (4)	1.87 / 1.04 (4.13)
11. There are limits to growth beyond which our industrialised society cannot expand.	2.8	6.6	6.1	**46.4**	38.1	4	4.1 / 0.98
12. People are severely abusing the environment.	3.8	1.6	5.5	35.2	**53.8**	5	4.34 /0.95

*Likert scale for the NEP items: (1) = completely disagree; (2) = disagree; (3) = neutral; (4) = agree; (5) = completely agree. **Agreement with items 3, 4, 6 and 10 (shown in shadow) indicates anti-environmental responses, whereas agreement with the other items shows pro-environmental responses.

et al., 2001). However, a general rule is that 0.6 to 0.7 indicates an acceptable level of consistency (Hulin et al., 2001). Ours is slightly above 0.7, the standard threshold considered in social sciences (Cortina, 1993). It is also above the alpha values found in other studies using the NEP Scale in tourism research. For instance, the seminal work by Uysal et al. (1994), obtained alphas between 0.45 and 0.71. More recently, López-Bonilla and López-Bonilla (2016) obtained an alpha of 0.52.

Table 4 shows for each NEP-scale item, its frequency distribution as well as the median and mean. The frequency corresponding to the mode is highlighted in bold. For the anti-environmental items, the median and mean corresponding to a pro-environmental recode is shown in parentheses. Through this recode, an agreement level of 1 with an anti-environmental item corresponds to an agreement level of 5 in the recoded variable. At the other extreme, 5 in an anti-environmental item corresponds to 1 in the recoded variable.

The median and mean scores of the items after recoding were high, thereby reflecting strong pro-environmental attitudes. In fact, the median only took the two highest values on the agreement scale (4 and 5), whereas the mean ranged from 3.84 to 4.55. Following Lück (2003), we also computed an aggregate measure of pro-environmental attitudes: the mean NEP score (M-NEP), which is the mean value of the NEP score over the 12 items. The value obtained (4.22) reinforces the indication of strong pro-environmental attitudes.

CHAID analysis

The survey results showed that 92.4% of the birdwatchers were willing to pay an entrance fee to improve birdwatching conditions in 'Quinta de Marim', and the maximum amount varied between €0.5 and €16. Among those willing to pay a fee, the average value was €4.3 (std. deviation = €2.6) and the most frequent answer was €5 (44.8% of the respondents).

As in Diaz-Pérez et al. (2005) and Díaz-Pérez and Bethencourt-Cejas (2016), to undertake the CHAID analysis the dependent variable 'maximum amount willing to pay' was categorized into two ranges based on the

Table 5. Chi-square tests between the dependent variable 'willingness to pay' and the predictor variables.

Predictor variables	Relevant categories		Chi-square tests χ² value	p-value
Nationality	Portuguese British Dutch	Other	29.243	0.000
Are you on vacations in the Algarve?	Yes	No	9.846	0.002
When you travel on vacation do you do birdwatching?	Yes	No	7.037	0.008
Is this your first time in this park?	Yes	No	4.809	0.028
Are you a member of any nature conservation organisation?	Yes	No	4.540	0.033
Is birdwatching the main reason for you to visit this park?	Yes	No	4.272	0.039
Are you travelling with friends?	Yes	No	3.936	0.047

average value: $\leq$ €4.3 and >€4.3. The independent variables included all socio-demographic items shown in Table 1, birdwatching characteristics (Tables 2 and 3) and a measure of pro-environmental attitude (the individual mean NEP score).

The relevant predictor variables identified by the CHAID method, based on chi-squared independence tests, are shown in Table 5. Each of these variables exhibited a significant relationship with the dependent variable (p-value < 0.05). In particular, attending to the p-value of the independence test, the variable 'nationality' was the most important in discriminating those who were willing to pay up to €4.3 or more. All respondents of a nationality other than British, Dutch or Portuguese were grouped into the category 'Other' in the CHAID analysis. This was due to the fact that every other nationality represented a low proportion of the sample (less than 10%).

The measure of pro-environmental attitude, the mean NEP score over the 12 items, is not shown in Table 5 because it is not a significant predictor of willingness to pay by the CHAID algorithm. Indeed, this variable did not report a significant relationship with the dependent variable (chi-squared independence test: p-value = 0.69 > 0.05). This indicates that there was no significant relation between the willingness to pay to improve birdwatching conditions and pro-environmental orientation. In short, data did not corroborate the link between environmental attitudes and the behavioural intention of willingness to pay.

The seven variables listed in Table 5 were used as predictors in the CHAID analysis. The results indicated a good predictive power since the overall percentage of correctly classified cases equalled 73.8%. The segmentation tree is depicted in Figure 2. The segments of birdwatchers are identified in the six final nodes of the tree; 1, 3, 4, 6, 8 and 9. Four variables significantly differentiated the segments in the following order of importance: 'Nationality', 'Are you a member of any nature conservation organization?', 'When you travel on vacation, do you do birdwatching?' and 'Is birdwatching the main reason for your visit to this park?'. So that these variables could be visualized in the tree, the criteria for the minimum number of cases in nodes was set at 10 for a 'parent node' and 5 for a 'child node'.

Node 0 shows that from those willing to pay, 160 individuals, 61.9% were willing to pay more than €4.3. Below this node, we can see that the first variable in the segmentation procedure was 'Nationality', originating three segments: nodes 1, 2 and 3. Node 1 included the Portuguese birdwatchers, the majority of whom showed a willingness to pay on the lower range, €4.3
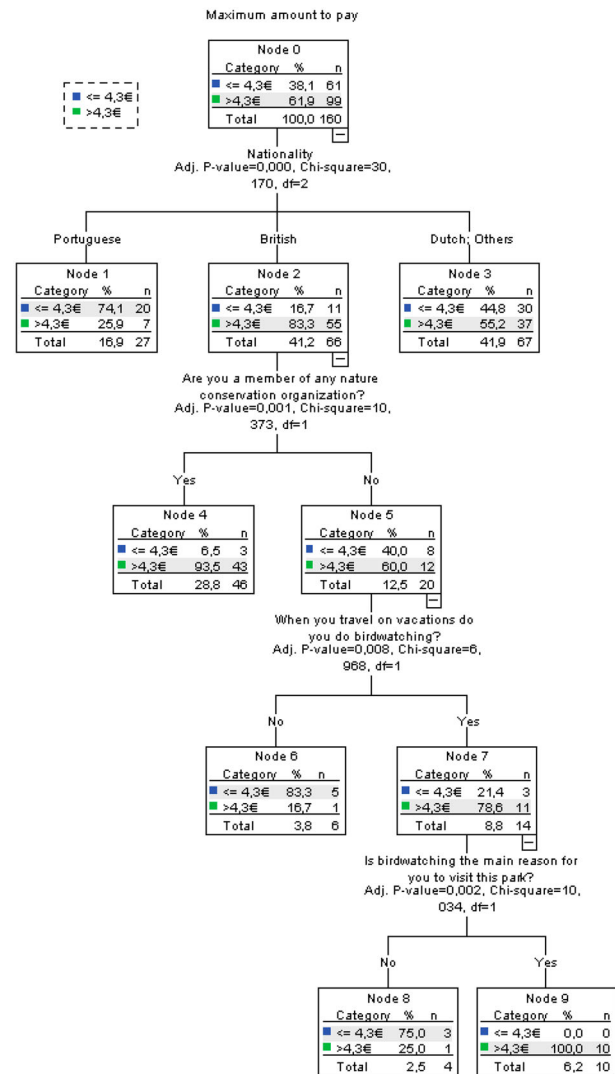

Figure 2. Tree diagram by the CHAID procedure.

or less. Node 2 was composed of British birdwatchers, with the large majority of them, 83.3%, willing to pay more than 4.3€. Finally, node 3, formed by birdwatchers of Dutch and other nationalities, was more homogeneously distributed regarding the willingness to pay: 55.2% were willing to pay more than 4.3€. By joining the categories Dutch and Others in node 3, CHAID showed that Dutch birdwatchers behaved similarly to birdwatchers of other nationalities (other than Dutch, British and Portuguese) regarding the amount they were willing to pay. After this first split, only British birdwatchers were further divided in terms of the six remaining variables listed in Table 5. This means that the amount that birdwatchers of different nationalities were willing to pay, in contrast to British birdwatchers, was independent of these variables.

Node 2, corresponding to the British birdwatchers, was further divided into two nodes, 4 and 5, based on

the variable 'Are you a member of any nature conservation organization?' Node 4 was a final node and included the British birdwatchers who were members of nature conservation organizations (46 individuals). The vast majority (93.5%) of these birdwatchers were willing to pay more than 4.3€. This percentage was much lower, 60%, for the British birdwatchers who were not members of nature conservation organizations (node 5).

Individuals in node 5 were then further divided into two groups based on the variable 'When you travel on vacation, do you do birdwatching?', forming nodes 6 and 7. Node 6 was another final node and included British individuals who were not members of environmental organizations nor were they used to doing birdwatching when on vacation. Even though they were visiting the natural park for that purpose, this was not a typical practice during their holidays. From those in this node, the majority, 83.3%, were willing to pay €4.3 or less. Node 7 included more individuals than node 6, a total of 14, and the majority, 78.6%, were willing to pay more than €4.3.

In a last step, individuals in node 7 were split into two groups based on the variable 'Is birdwatching the main reason for your visit to this park?', producing two final nodes: 8 and 9. For most individuals in node 8, for whom birdwatching was not the main reason for visiting the park, only one was willing to pay more than €4.3. The opposite characterized node 9 in which all individuals chose the park for the primary purpose of doing birdwatching. All individuals in node 9 were willing to pay more than €4.3.

The sample proportion of respondents willing to pay more than €4.3 was 61.9%, as indicated in node 0. Two final segments showed higher proportions. The first one corresponded to node 4 and included British birdwatchers who were members of nature conservation organizations. In this segment, 93.5% of the individuals were willing to pay more than €4.3. This proportion corresponded to 151.1% of the sample proportion. Given the characteristics identified in the tree, the individuals in this segment were named 'environmental stewards'. The second one, corresponding to node 9, included British birdwatchers who were not members of nature conservation organizations, who did birdwatching during vacations and were in the park with that main objective. This segment was named 'birdwatching fans'. All individuals in this group were willing to pay more than €4.3. Therefore, the proportion of individuals willing to pay more than €4.3 was 161.6% of the sample proportion.

In order to better understand the profiles of these two segments and compare them with the remaining birdwatchers, some additional descriptive results were

Table 6. Socio-economic characteristics of the segments most prone to pay.

Socio-economic variables	Node 9 (environmental stewards) ($n = 10$)	Node 4 (birdwatching fans) ($n = 46$)	Other nodes (others) ($n = 104$)
Age (Average)	50.89	63.11	45.08
Gender			
(% Females)	60	51.1	42.1
Marital status			
(% Married)	100	72.1	47.0
Professional status			
(% Retired)	0	84.1	29.5
(% Entrepreneur)	55.6	6.8	6.3
Monthly income			
(≤1000€)	0	7.9	37.3
(>2000€)	90	47.4	31.3

obtained regarding other socio-economic variables included in the survey. As shown in Table 6, the individuals more prone to pay a fee to improve birdwatching conditions in 'Quinta de Marim', that is, 'environmental stewards' and 'birdwatching fans', were older than the others (Kruskal–Wallis test: p-value ≈ 0.000). The proportion of women and married individuals was also higher in the two segments. Another noteworthy characteristic relates to the professional situation. Indeed, the majority of the 'birdwatching fans' were retired (84.1%), and the majority of 'environmental stewards' were entrepreneurs (55.6%). The proportions of retired individuals and entrepreneurs were relatively low within the 'Others' group (29.5% and 6.3%, respectively). The two segments also benefitted from high income levels: 90% of the 'environmental stewards' and 47.4% of the 'birdwatching fans' had a monthly income that exceeded €2000. This percentage was significantly lower for the other birdwatchers (31.3%).

Discussion

The survey of birdwatchers in the Ria Formosa Natural Park (RFNP) showed that they were highly educated individuals, with an average age of 50 years old. Their income was of a medium-high level, which is in line with previous studies (e.g. Chen & Chen, 2015; Connell, 2009; Guimarães et al., 2015). Regarding marital status and occupation, this sample paralleled the results of Scott and Thigpen (2003): birdwatchers were mainly married and a large proportion of them were retired. Gender followed the general trend of women being equally represented in this activity (e.g. Eubanks et al., 2004; Lee et al., 2010).

Regarding the practice of birdwatching, the results showed a high level of commitment to the activity. In fact, the majority of respondents did birdwatching on

vacations, had specialist gear and revealed a good knowledge about birds. Moreover, 62.7% were members of nature conservation organizations. The high commitment of birdwatchers to nature conservation is in line with previous studies. For instance, this was found by Chen and Chen (2015) among birdwatchers who visit Taiwan, and by Vas (2017) among birdwatchers of English-speaking countries. The high level of commitment to the activity and to nature conservation shown by birdwatchers in our survey is crucial information for destination managers in planning and promoting the Algarve as a birdwatching destination.

Having presented the study results, we can now answer the three research questions.

Q1: What characterizes the environmental attitudes of birdwatchers in the RFNP? The NEP Scale showed a mean score of 4.22, which indicates strong pro-environmental attitudes. This value is significantly higher than the mean scores obtained in previous studies for general populations. In the original study on the NEP Scale, Dunlap and Van Liere (1978) obtained for a general public sample a mean NEP score of 3.67 (3.0 on a 1–4 scale; all mean NEP values shown hereafter are presented on the classic 1–5 scale). In a subsequent study involving the residents of Iowa (USA), Albrecht et al. (1982) found mean NEP scores of 3.53 and 3.93, for farmers and urban residents, respectively.

The mean NEP score obtained in this survey is in line with the results obtained in the context of nature-based tourism studies in developed countries. For instance, Lück (2000) obtained a mean NEP score of 4.20 for participants in dolphin watching in New Zealand. Jackson (2007) applied the NEP Scale to groups from the UK tourism industry. The members of the Royal Society for the Protection of Birds, considered to be potential specialized ecotourists, showed the highest median NEP score: 4.40. College staff, taken as potential general ecotourists, exhibited a median NEP score of 4.16. In a study conducted on golfers in Wales (UK), Minoli et al. (2018) obtained a mean NEP score of 4.29.

Studies on environmental attitudes of tourists in developing countries have shown significantly lower mean NEP scores, when compared to those of developed countries. For instance, Kim et al. (2006) applied the NEP Scale to the participants of an international festival of environmental film and video in Brazil and obtained a mean score of 3.59. Luo and Deng (2008) surveyed visitors to a national park in China and reached a mean NEP score of 3.54. In a study of visitors to a natural park in Pakistan, tourists showed a mean NEP score of 3.19 (Imran et al., 2014). Giddy and Webb (2018) found a score of 3.55 in a study of adventure tourists in South Africa.

Taking into consideration that the majority of individuals in our study were members of nature conservation organizations, the high mean NEP score is in accordance with the findings of Hawcroft and Milfont (2010). Through a meta-analysis of studies using the NEP over 30 years, these authors found that 'environmentalists' tend to score higher in the mean NEP.

Q2: Is there a link between their environmental attitudes and willingness to pay for an improvement in the quality of the site, a pro-environmental behavioural intention?

The assessment of the environmental attitudes of birdwatchers via the NEP Scale was complemented with an analysis of their willingness to pay an entrance fee to improve birdwatching facilities, that is, a behavioural intention.

A key result of our study is that environmental attitudes, measured by the individual mean NEP score, are not a significant predictor of the willingness to pay in the CHAID analysis. This indicates that environmental attitudes do not significantly influence a behavioural intention in terms of a monetary contribution to improve birdwatching facilities. This indicates a missing link between environmental attitudes and environmentally friendly behaviour. To the best of our knowledge, this result is new in the context of birdwatching.

This missing link was also found by Wearing et al. (2002) in a study on international backpackers in Australia. The authors stress that the relationship between environmental concern, intention and behaviour is fragile and poses an important challenge to ecotourism. The existence of a gap between attitudes and environmental behaviour has been documented in other fields, such as environmental psychology (e.g. Fransson & Gärling, 1999) and in consumer behaviour (e.g. Minton & Rose, 1997). Moreover, the lack of correspondence between attitudes and behaviour is an old topic in behavioural sciences (Ajzen & Fishbein, 1977).

The bulk of the literature addressing environmental attitudes and environmental behaviour does show, however, a relationship between these two elements. Dolnicar and Leisch (2008), using a sample of Australian tourists, showed through a regression analysis that the NEP score is a significant explanatory variable of pro-environmental behaviour. Veisten et al. (2014) use a regression model to explain the expenditure of nature-based tourists in a Norwegian natural park, in which the NEP score is used as an explanatory variable. It was found that a higher NEP score has a positive impact on tourist expenditure. Park et al. (2018), based on a structural equation model applied to a sample of Korean travellers, found that environmental beliefs measured by the NEP had a significant effect on environmental

behaviour intention. He et al. (2018), also based on structural equation modelling, reached a similar conclusion regarding tourists in central China: environmental commitment has a positive effect on intentions for environmentally responsible behaviour.

What can justify the missing link between environmental attitudes and environmentally friendly behaviour found in our case study? According to Wearing et al. (2002) the missing link may emerge in tourism simply because individuals travel away from their homes. By leaving their daily routine, tourists are likely to behave differently. Some social norms that govern behaviour at home may be abandoned in holidays and impact on pro-environmental behaviour. Hence, in some tourism contexts, such as birdwatching in our case study, pro-environmental attitudes may not translate into pro-environmental behaviour.

Q3: To what extent is the birdwatching activity able to contribute to fund the protected area, i.e. what percentage of birdwatchers is willing to contribute to the improvement of the site? How much would they be willing to pay? And what are the characteristics of segments with a higher willingness to contribute?

The survey results showed that the vast majority of the sample was willing to pay an entrance fee (92%). It also showed that the maximum amount birdwatchers are willing to pay ranges from €0.5 to €16, with an average value of €4.3, and a mode (the most frequent response) of €5. Moreover, the CHAID analysis allowed identifying the birdwatchers' characteristics strongly associated with a greater willingness to contribute to the protected areas. Indeed, 'nationality' was shown to be the most important segmentation variable, with the British showing a greater willingness to pay than the Portuguese and other nationalities. The other important variables are: 'Member of nature conservation organization?'; 'Do you do birdwatching on vacation?'; 'Is birdwatching the main reason for your visit to this park?'

Overall, among the socio-economic variables, only nationality was a significant predictor. None of the most common socio-demographic factors found in previous studies, such as age, gender, education, income and political orientation (Dolnicar, 2010; Kiatkawsin & Han, 2017) were significant predictors in the segmentation process. Three out of the four predictor variables were not socio-demographic. This result is in accordance with the finding of Uysal et al. (1994) that the most important variables in identifying environmentally sensitive tourists are behavioural rather than demographic. Having behavioural variables as the main predictors of environmental attitudes was also found by Valle et al. (2012) and Miller et al. (2015).

The CHAID analysis revealed two segments with a willingness to pay to improve birdwatching facilities in the RFNP above the overall sample. The most notable was 'birdwatching fans', in which all individuals were willing to pay an entrance fee above the average value (€4.3). This segment was composed of UK nationals who birdwatch on vacations and whose main reason to visit the site was birdwatching. Nationality and hence culture play a crucial role in the willingness to pay of birdwatchers. People who practise birdwatching on holidays and whose main purpose when visiting a natural site is birdwatching are more prone to contribute to improving birdwatching facilities. The other segment was 'environmental stewards', with 93.5% willing to pay an entrance fee above the average value. This segment was composed of UK nationals who were members of nature conservation organizations. The association of personal norms like altruism with pro-environmental behaviour is in line with previous studies (Mehmetoglu, 2010; Valle et al., 2012).

Conclusion

Through a survey of birdwatchers in the RFNP located in South Portugal, this paper contributes to three strands of research, which are still underdeveloped: first, the environmental attitudes of birdwatchers, particularly in South European countries (Steven et al., 2015); second, the link between environmental attitudes and pro-environmental behaviour of birdwatchers; and third, park finance, by understanding visitors' willingness to pay to improve site facilities (Eagles, 2014).

Regarding the first contribution, using the NEP Scale, our study shows that birdwatchers in the RFNP present strong pro-environmental attitudes, which is in line with previous results on nature-based tourism in developed countries. The second contribution is the main novelty of our paper. We explore the link between environmental attitudes and willingness to pay, a behavioural intention variable, by using the NEP Scale in a CHAID analysis. This methodology allows, among other aspects, the identification of possible links between environmental attitudes and behavioural intentions. To the best of our knowledge, this methodological approach is novel in the tourism literature. The results show that environmental attitudes are not predictors of willingness to pay to improve the environmental quality of the site, a behavioural intention. This missing link between attitudes and behaviour is new in the context of birdwatching tourism literature. With regard to the third contribution, the results show that the vast majority of respondents are willing to pay an entrance fee to improve the environmental quality of the park.

This shows that the management of protected areas can raise significant funds for environmental improvements by applying a user-pay principle, or even voluntary contributions. The methodology proposed identifies the segments with the highest willingness to pay.

This study has important policy implications. It suggests that birdwatching tourism has great potential in the RFNP, as birdwatchers have pro-environmental attitudes and are willing to contribute to improving birdwatching infrastructures. As shown by Steven et al. (2013), tourism revenue can make a significant contribution to nature conservation. The fact that the vast majority of birdwatchers are willing to pay to improve the site shows that significant revenue, through an entrance fee or even a voluntary contribution, can be generated. Moreover, our study shows that birdwatchers may attribute a significant economic value to improvements in birdwatching facilities. This concurs with the findings of the studies by Lee et al. (2009) and Lee et al. (2010), which assessed the economic value of public birdwatching services in South Korea, using contingent valuation and choice experiment methods, respectively. As shown by Whitelaw et al. (2014) and Liu et al. (2013), assessing visitors' willingness to pay for environmental services in protected areas is crucial to designing alternative funding sources, such as visitor fees.

Our results indicate that special attention should be paid to the UK market, as British birdwatchers show the highest willingness to pay. Targeting the UK market to promote the RFNP as a birdwatching destination should not demand a large investment, as British is already the main nationality of tourists in the Algarve.

This study presents some limitations, which open up opportunities for further research. First, a larger sample size would make the results more robust. Second, the questionnaire could be applied to other sites/clusters of the RFNP and the Algarve to validate results and further segment birdwatchers. Third, as a few years have passed since data collection, a new application of the survey could contribute to validate the results. Another research avenue would be to evaluate birdwatchers' willingness to pay through a contingent valuation survey, where the scenario of improved infrastructures would be presented through visual materials. Finally, it would be beneficial to conduct a comprehensive study of the impacts of birdwatching development in the RFNP in order to assess its sustainability.

Disclosure statement

No potential conflict of interest was reported by the author(s).

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