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Can whale-watching and whaling co-exist? Tourist perceptions in Iceland

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Both whaling and whale-watching tourism occur in Iceland, but these activities are considered incompatible by many, and previous studies have suggested that whale-watch tourists would boycott whale-watch destinations where whaling takes place. This study assessed the perceptions of and attitudes towards ongoing whaling amongst whale-watch tourists in Iceland. A majority of whale-watching tourists in Iceland did not support whaling and did not think that whale-watching and whaling could exist side by side. However, 31% of respondents were unaware of Iceland's whaling before their visit and most of these indicated that prior knowledge of whaling activities would not have affected their choice of destination. More tourists had tried whale meat than either puffin or guillemot meat, suggesting that whale meat may be more strongly marketed to tourists visiting Iceland. These results suggest that not all tourists would consider boycotting travel to a whaling nation. The whale-watch industry is important to Iceland's economy, but given that the whaling industry can potentially negatively impact upon whale-watching activities, a careful analysis of the compatibility of these two industries is recommended.

Keywords: tourism, commercial whaling, questionnaire, whale meat, seabirds, traditions, Iceland

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INTRODUCTION

There are three forms of whaling as distinguished by the International Whaling Commission (IWC): those conducted for commercial, aboriginal subsistence and research purposes (Freeman, 1993). Aboriginal subsistence whaling (ASW) was proposed in 1981 as whaling 'for purposes of local aboriginal consumption carried out by or on behalf of aboriginal, indigenous or native people who share strong community, familial, social and cultural ties related to a continuing traditional dependence on whaling and on the use of whales' (Donovan, 1982), while commercial whaling is simply defined as any whaling, unrelated to research, which does not fit with the aforementioned definition (Holt, 1985).

Worldwide, several countries still practise either ASW or commercial whaling (Reeves, 2002; WWF, 2003; Corkeron, 2007; Hoyt, 2008), whilst the majority of industrial nations are opposed to whaling at a commercial scale (Aron *et al.*, 2000). Most of the whale stocks depleted in the past have yet to recover to pre-whaling levels (Brownell *et al.*, 1989; Brownell, 1995; Clapham *et al.*, 1999; Aron *et al.*, 2000; Clapham & Baker, 2002; Alter *et al.*, 2007). However, those who support whaling propose that sustainable harvests of some whale stocks are now possible (Aron *et al.*, 2000), and some countries even argue that culling of marine mammals is necessary to reduce conflict with commercial fisheries and re-establish 'balance' in certain marine ecosystems (Lavigne, 2003; Swartz & Pauly, 2008).

In Iceland, whaling began around the 17th Century when Basque hunters came to the region (Cunningham *et al.*, 2012), and modern whaling started around 1883 (Sigurjónsson, 1988; Sigurjónsson & Gunnlaugsson, 2006). Despite this history of whaling activity, whale meat has not been a particularly important traditional food in Iceland (Altherr, 2003). The occasional use, in the past, of whale meat on an opportunistically-harvested basis has been reported (Einarsson, 1987), but in the second half of the 20th Century the only 'traditional' use that was left was *sour whale* (traditionally prepared whale blubber), of which Icelanders might sample a small piece during the midwinter festival *þorrablót* (Altherr, 2003). The current view of whale meat in Iceland is still as a specialty food for Icelandic people, but it is also promoted to tourists as a novelty food. Several other marine species are available in Iceland as unusual local foods. Shark meat, mainly Greenland or basking shark, is also offered in Iceland, accompanied with a shot of the local spirit called brennivín (Trichopoulou *et al.*, 2007). The harvesting of seabirds for their meat, eggs and feathers (Petersen, 2005) also takes place. Puffins (*Fratercula arctica*) have been traditionally hunted for many centuries around Iceland (Petersen, 2005); they are considered a delicacy and have been part of the Icelandic diet for many generations (Sigurgeirsson, 2001).

In Iceland, minke whales are the main target species of the whale-watching industry around Húsavík (Hoyt & Hvenegaard, 2002) and Reykjavik (O'Connor *et al.*, 2009). Most recently, the abundance estimates available for minke whales have detected a drastic decline within Icelandic

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coastal waters (Pike *et al.*, 2011). This decrease in the number of minke whales observed could be the result of food shortage in the south-west area, most likely due to a severe decline, since 2005, in the sandeel (*Ammodytes* sp.) population (Bogason & Lilliendahl, 2009; Víkingsson *et al.*, 2014), which has also affected puffin, razorbill and common guillemot colonies in the area (Bornaechea & Gardarsson, 2006; Gardarsson, 2006b; Umhverfisráðuneytið, 2011; Helgason, 2012). A complete ban of puffin harvesting, in order to give the population a chance to recover, has recently been suggested (Helgason, 2012). However, the decline in the minke population may be also in part due to whaling activities which have been conducted in waters adjoining the whale-watching area in Faxaflói Bay since 2006. Further research is needed in order to produce accurate estimates of abundance and residency patterns of minke whales in Icelandic coastal waters, in order to assess the sustainability of the whaling industry.

Whilst some supporters of whaling believe that it is possible for commercial whaling and whale-watching to co–exist, thereby providing two sources of revenue (Moyle & Evans, 2008), several studies have suggested that the coexistence of these two industries is not feasible (Orams, 2001; Higham & Lusseau, 2008). As well as reducing whale populations overall, whaling can impact upon the local whale populations which support many whale-watching industries, for example by potentially causing whales to develop avoidance responses to boats (Hoyt & Hvenegaard, 2002). A number of studies on the attitudes of tourists towards whaling have found that whale-watchers did not support commercial whaling (e.g. Orams, 2001; Parsons & Rawles, 2003; Wende & Gothall, 2008; Kuo *et al.*, 2012). A study in Scotland documented that 79% of whale-watchers would boycott a country where whaling occurs, and 91.4% of respondents stated that they would not take part in whale-watching tours in such a country (Parsons & Rawles, 2003). A recent study suggested that, in any given location, the resumption of commercial whaling could result in a decline in whale-watching demand and a reduction in visitor numbers overall (Kuo *et al.*, 2012). However, numerous studies have demonstrated that cetacean-watching activities can also have negative impacts on whales and dolphins (summarized in Parsons, 2012). Impacts such as interruption of feeding behaviour (e.g. Steckenreuter *et al.*, 2012; Christiansen *et al.*, 2013) and collisions between whale-watch vessels and cetaceans (Laist *et al.*, 2001; Leaper, 2001) may have biologically significant effects at the population level. Furthermore, because many whales display intra-annual and inter-annual site fidelity, and some of those sites are areas where whale-watching take place (Clapham *et al.*, 1992), whale-watching may impact upon certain individuals or groups of whales more than others (Lien, 2001).

In contrast to the long history of consumptive use of marine wildlife in Iceland, the history of whale-watching is comparatively recent. Whale-watching only commenced as a commercial venture in the 1990s, after the publication of a feasibility study (Lindquist, 1990). Not long afterwards, Iceland re-joined the IWC (in 2002) and resumed commercial whaling in 2006. Despite this resumption of whaling, the whale-watching industry grew from 61,000 whale-watchers in 2000 to 115,000 in 2008, representing a 12% growth per annum (Agnarsson, 2010). This might appear to support the view that whaling has not discouraged whale-watch tourists from visiting Iceland.

This study addressed the perceptions of whale-watch tourists in Iceland towards whaling, and examined whether the nationality and environmental awareness of tourists affected their attitudes. The study also examined the frequency of whale meat consumption amongst tourists, using the consumption of seabird meat as a comparison. Ultimately, the study aimed to address whether Icelandic whaling might be considered as detrimental to the lucrative whale-watch industry, via its impacts on tourist behaviour, and to describe the means by which the whaling industry is potentially reliant on whale-watch tourism for a significant sector of its market.

MATERIALS AND METHODS

From 8 June to 28 August 2009, questionnaires were completed by tourists (18 yrs and older), on-board whale-watch vessels run by a single company (Elding whale-watching, based in Reykjavik, Faxaflói Bay). Passengers responded to 19 questions in English (see Appendix) relating to whaling, whale-watching, their opinions on the coexistence of these two activities and their experiences of whale and seabird meat consumption. The participants were left to complete the questionnaires themselves, although some of the authors (C.G.B., T.B. and D.S.M) were present to provide clarification on the questions, if required. Demographic information was also collected from participants including: sex, age, nationality (country of origin) and reason(s) for being in Iceland. The majority of the questions comprised closed-ended and multiple-choice one-answer questions (Brace, 2004). Where questions allowed the respondents to choose more than one answer, the total number of answers provided was used to calculate proportions of each response.

The influences of nationality (whether respondents came from commercial or scientific whaling nations or non-whaling nations) and environmental awareness, on attitudes towards whaling and consumption of whale meat were investigated. Data are presented as proportions of the total number of questionnaires completed except where multiple answers were allowed, in which case the total number of responses (N) is also provided. For all statistical analyses, the 'no answer' response category was excluded, and data were then analysed using χ^2 tests in R v.1.4.1 (R Development Core Team, 2010).

RESULTS

Questionnaires were collected on a total of 49 whale-watching tours over 39 days. In total, 1421 questionnaires were completed (N = 580 in June, N = 443 in July, N = 398 in August), including 34 questionnaires completed by Icelandic respondents. Since the study aimed to address the attitudes of overseas tourists only, these 34 questionnaires were removed from the final sample, resulting in a sample size of 1387 questionnaires. The majority of respondents were aged between 26 and 40 (38.1%: 18–25; 14.3%: 41–60: 35.0%; over 60: 11.1%; no answer (n/a) = 1.5%). There were more female respondents (51.7%) than male (46.7%; n/a: 1.6%). Most respondents were European (82.3%), followed by North American (10.4%). A smaller percentage were from other countries, including Asia (3.0%), Australia and New

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Zealand (1.4%), as well as South America (0.9%), Africa (0.2%) and Middle East (0.3%; n/a: 1.4%). These figures mirror the 2009 Icelandic Tourist Board data on tourist origin: 70.4% from Europe, 11.5% from North America and 16.1% from elsewhere (Tourist Board Data, n.d.) (Figure 1). Respondents from whaling nations (Faroe Islands $n = 1$, Norway $n = 38$ and Japan N = 10) accounted for 3.5% of all respondents. The majority of tourists (89.9%) were on their first visit to Iceland.

Whale-watch passengers were asked the question 'What was/were the main reason(s) for you to come to Iceland?' (total number of responses N = 2535) and the main reason given was 'the landscape' (41.3%), followed by 'whale-watching' (19.4%), 'the Icelandic culture' (19.0%), 'other' (11.5%), 'work and/or conference' (4.7%) and 'visiting friends' (3.8%; n/a: 0.2%). In order to assess respondents' levels of interest or involvement in environmental issues, they were also asked whether they have ever been members of an environmental organization (e.g. WWF, Greenpeace, etc.). Significantly more people (75.1%) had never been involved in any such organization ($\chi^2 = 380.0587$, df = 1, $P < 0.01$) (member: 22.7%, n/a: 1.6%). The majority (71.1%) of respondents also did not have any previous whale-watching experience (previous experience: 28.0%; n/a: 0.9%). Of the subset of 493 tourists who had come to Iceland primarily for whale-watching, 30.6% had been whale-watching before (no prior whale-watching experience: 68.2%; n/a: 1.2%).

When asked about their opinion of whaling, the majority of respondents (75.2%) declared themselves to be opposed, whilst 16% supported whaling (n/a: 8.8%). When the responses of tourists from whaling and non-whaling nations were analysed separately, a distinct difference in attitude was apparent: of 49 people from whaling countries, 67.4% were in favour of whaling (against: 16.3%; n/a: 16.3%), whilst the majority of respondents from non-whaling countries

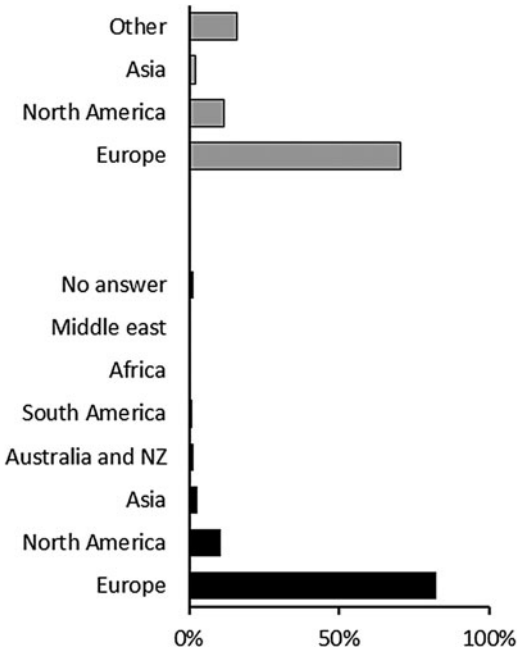

Fig. 1. Nationalities of whale-watching tourists completing questionnaires (black) and 2009 Icelandic Tourist Board data on nationalities of tourists visiting Iceland (grey).

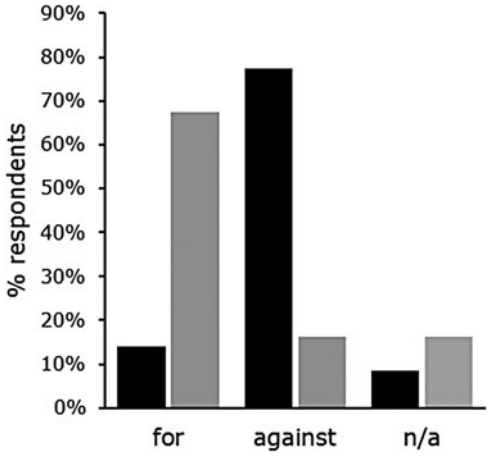

Fig. 2. Proportions of respondents from whaling (grey) and non-whaling (black) nations who supported ('for') and were opposed to ('against') whaling.

(N = 1338) opposed the practice (opposed: 77.4%; in favour: 14.1%; n/a: 8.5%; Figure 2). 31.2% of respondents (N = 944) did not know about Iceland's whaling activities prior to their visit (n/a: 0.7%). Only 18.7% of this group stated that they would have supported a boycott of the country for its decision to resume whaling (that is, they would have chosen not to visit Iceland if they had had knowledge of Iceland's whaling policy prior to their visit) (n/a: 4.4%).

The attitude of respondents towards whale meat consumption was also examined. When asked 'Have you ever consumed whale meat?', significantly more respondents (65.0%) stated that they would never try it (tried it: 20.0%, not yet, but I will: 12.8%, n/a: 2.1%; $\chi^2 = 680.0825$, df = 2, $P < 0.01$; Figure 3). Of respondents who had tried whale meat already or had not yet tried but wanted to (N = 499), the majority (69.1%) stated that they would do so or had done so out of curiosity. Nevertheless, the vast majority of respondents (79.7%) agreed that whale meat consumption supports whaling (did not agree: 15.3%; n/a: 5.0%). To investigate how people perceive the consumption of whale meat compared to other wild sources of meat, passengers were also asked whether they had tried puffin or guillemot meat (hereafter referred to as bird meat). Only 6.1% of tourists stated that they had tried meat from one of these two seabird species,

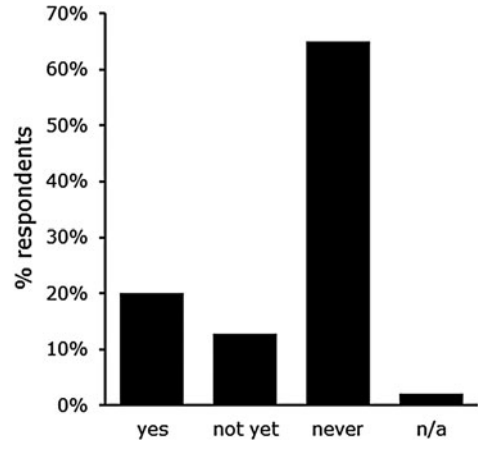

Fig. 3. Responses to the question 'Have you ever consumed whale meat?'; N = 1387.

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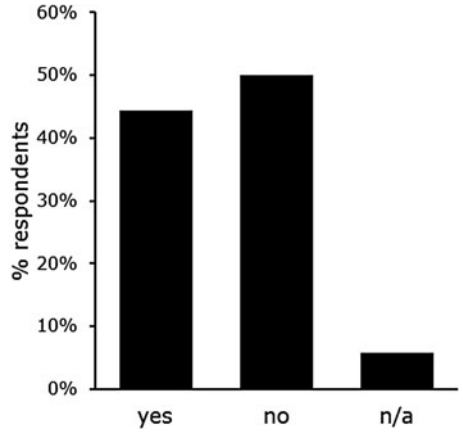

Fig. 4. Responses to the question 'Do you see any difference between consuming whale or wild bird meat?'; N = 1387.

while a significant proportion of them (68.0%) again declared that they would never try it (not yet but I will: 22.4%; no answer: 3.3%; $\chi^2 = 888.5157$, df = 2, $P < 0.01$). Significantly more people (50.0%) were of the opinion that there was no difference between consuming whale and bird meat (there is a difference: 44.3%; n/a: 5.8%; Figure 4; $\chi^2 = 4.7751$, df = 1, $P < 0.05$).

Factors affecting respondents' attitudes towards a boycott of travel to Iceland were investigated solely within the group of people who did not know that Iceland practiced whaling, before their visit (N = 433). A χ^2 test to examine whether a person's involvement in environmental issues affected their inclination to boycott Iceland because of its whaling activities revealed that the majority of those who would support a boycott had never been a member of any environmental group (72.8%; n/a: 1.2%; $\chi^2 = 18.05$, df = 1, $P < 0.01$). The link between membership of an environmental organization and the likelihood that a respondent had tried whale meat and seabird meat was also investigated. The majority of both non-members and members would neither try whale meat (non-members: 62.8%; members: 71.1%) nor puffin/guillemot meat (non-members: 66.6%; members: 72.9%).

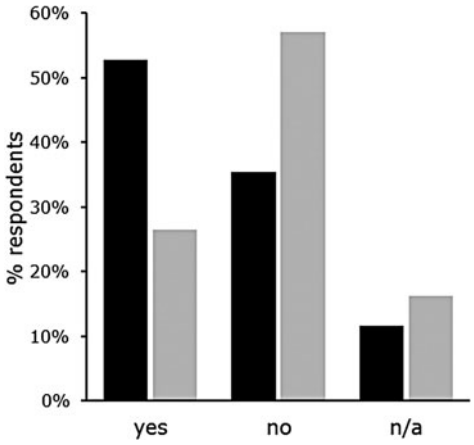

Fig. 5. Responses to the question 'Do you think that whale hunting might interfere with whale-watching operations?' (black—non-whaling countries, N = 1338; grey—whaling countries, N = 49).

Nationality was a key determining factor in whether respondents had tried whale meat or not. The majority of people from whaling countries had tried it (71.4%), whilst a considerably smaller proportion of people from non-whaling countries had done so (18.2%; n/a: 2.2%). For the majority of people from whaling countries (N = 49), the enjoyment of the taste of whale meat was the main motivation (enjoyment: 42.3%, curiosity: 28.8%, would not consume it: 13.5%, other: 11.5%). The majority of respondents from both whaling (87.8%; n/a: 6.1%) and non-whaling (90.5%; n/a: 3.2%) nations had never tried wild bird meat. Finally, more respondents from whaling countries believed that whaling did not interfere with whale-watching activities (does not interfere: 57.1%; does interfere: 26.5%; n/a: 16.3%), whilst in contrast, the majority of respondents from non-whaling nations believed that it does interfere (52.8%; does not interfere: 35.4%; n/a: 11.7%; Figure 5).

DISCUSSION

More than 100,000 tourists each year, 1 in 8 visitors, go whale-watching in Iceland (Hoyt, 2001; O'Connor *et al.*, 2009). In 2010, whale-watching in Iceland directly contributed US$6.3 m (€4.6 m; €1 = US$1.37 (online conversion, 20 October 2013)) to the national economy and had a total economic impact of US$16.4 m (€12.0 m) (Cunningham *et al.*, 2012). It is thus evident that whale-watching in Iceland is important to the local economy and could potentially continue to grow if promoted in a sustainable way.

The conflict of interest between whale-watching and whaling in Iceland in recent years has received much attention, especially after the Icelandic government's decision to resume commercial whaling in 2006. Previous studies have investigated this issue (e.g. Parsons & Rawles, 2003; Cunningham et *al.*, 2012), but there are very few that have examined how whale-watch tourists may react if whaling occurs in their preferred whale-watching destination (Higham & Lusseau, 2007; 2008). Investigating the cultural and environmental values of this demographic may facilitate an understanding of the degree to which they will partake in whale-watching, in whaling nations (Higham & Lusseau, 2007).

Respondents were asked whether they belonged to an environmental organization, or had ever done so, to provide a means of assessing the environmental awareness of respondents, and potentially to examine whether an interest in environmental issues might be a factor affecting attitudes towards whaling or the consumption of whale meat. It was difficult to test the latter hypothesis, given a majority of non-member respondents. Some studies have proposed that people with a higher level of environmental concern are more frequently involved in environmentally-responsible behaviours (e.g. Antil, 1984; Roberts, 1991; Shetzer *et al.*, 1991; Urban & Ščasný, 2012). However, attempting to qualify environmental concern is difficult, since this can encompass many issues and behaviours, and membership of environmental groups may in fact not have been a suitable measure of the awareness or concerns of respondents in this study. Future studies of this nature should investigate other means of qualifying environmental concern amongst interviewees, such as petitioning on environmental issues, or 'private-sphere' environmental behaviours like 'green' consumerism and household waste management practices (Stern, 2000).

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A prevalence of first-time whale-watchers amongst respondents suggests that lack of awareness of issues surrounding the sustainability of both whaling and whale-watching might have contributed to the attitudes documented in this study. The majority of respondents were opposed to whaling, although predictably, there was a strong correlation between support for whaling and nationality. The majority of whale-watchers come from Western countries, have Western ecological values and thus do not perceive whales and dolphins as the harvestable resource they were considered to be in the past (Einarsson, 1993, 1997; Hinch, 2001; Hoyt, 2001). Given that the vast majority of respondents in this study were European, the opinions described in this study represent largely this Western viewpoint. A third of respondents did not know that Iceland was a whaling nation, prior to their visit, and only a relatively small proportion of this group stated that they would support a boycott of travel to Iceland because of its whaling activities. This contrasts with previous studies, which have suggested that many whale-watching tourists would not choose to visit whaling nations, and that whaling nations could lose a significant proportion of their tourism market by resuming commercial whaling (e.g. Parsons & Rawles, 2003; Kuo *et al.*, 2012). Respondents in this study who were aware of Iceland's whaling activities prior to their visit may have believed that a boycott would have no effect on whaling policy, or their desire to visit Iceland may have over-ridden any environmental concerns. Alternatively, tourists may see their visit to Iceland and participation in whale-watching activities as a means by which to express their support of this industry as an alternative to whaling. However, this study clearly represents only the opinions and choices of tourists already in Iceland. It is possible that a large number of potential tourists and whale-watchers, perhaps those more aware of environmental issues or with involvement in environmental groups, had chosen not to visit. The results presented here do not, then, represent the attitudes of whale-watchers in Europe overall, but rather the specific demographic of whale-watchers visiting Iceland (which does, however, include a considerable number of visitors who were not aware of whaling in Iceland prior to their visit). In order to assess whether significant numbers of tourists do in fact choose not to visit because of the whaling industry, the sample population would have had to be broadened to include respondents outside of Iceland, which was beyond the scope of the present study.

Most of the respondents had visited Iceland either for the landscape or in order to whale-watch, but culture was also mentioned as a reason for visiting, and the consumption of whale meat, marketed as a 'traditional' food, is thus an activity that many tourists might consider during their visit. Despite the lack of support for whaling amongst tourists, some respondents had already tried or would consider trying whale meat. These somewhat contradictory findings may be linked to the marketing of whale meat to tourists, or an inability of the tourists to make a connection between this consumption and the support that it provides for the whaling industry. Numerous studies have identified similar disconnections between consumers' concerns and their behaviour (e.g. Webster, 1975; Ritchie *et al.*, 1981; Verhallen & Van Raaij, 1981). A majority of respondents believed that whaling might interfere with whale-watching activities, although respondents were not asked to qualify the way(s) in which they thought this interference might manifest. Nonetheless, this highlights that the harvesting of whales and the need to have healthy populations of live whales for tourists to watch do not appear to be compatible activities, at first glance, to the general whale-watching public.

Minke whale meat is used solely for local consumption in Iceland, yet current demand appears to be small. In a survey carried out in 2005, 86% of the Icelandic population did not buy whale meat during a 12 month period prior to their interview (Siglaugsson, 2005b). An online survey of 815 Icelandic people showed that only 12.2% of respondents had tried whale meat three or more times during the 12 months prior to the time of the study, and only 5.3% had purchased the whale meat six times or more in the last 12 months (IFAW, 2010). Almost 20% of respondents in this study had tried whale meat, and over 12% more would consider doing so, suggesting that tourism provides a market for the sale of Icelandic whale meat. In contrast, only 6% of tourists had tried seabird meat, and the majority of questionnaire respondents stated that they would never try it, yet both puffin and guillemot are acknowledged to be part of the 'traditional Icelandic cuisine' and are, therefore, offered in many restaurants in downtown Reykjavik (C.G.B., personal observation). There is a documented failure in breeding success in different seabird species in Iceland (Bornaechea & Garðarsson, 2006; Garðarsson, 2006a, b; Hallgrímsson, 2011), and the sustainability of hunting seabirds for food has yet to be established (Helgason, 2012), yet it is likely that tourists are less aware of this issue than of the high-profile decline of many baleen whale species and the many efforts to conserve whales in recent decades. Nonetheless, whale meat consumption appears to be far more popular amongst tourists than seabird meat.

It would thus be pertinent to assess whether the number of tourists consuming whale meat has increased in recent years due to changes in availability, additional marketing of whale meat to the tourist sector or a difference in demand, perhaps because so-called 'traditional' whaling and opportunities to try whale meat add to the novelty of the tourists' experiences (Higham & Lusseau, 2008). Certainly, in recent years, a highly visible campaign to promote the consumption of whale meat has been conducted in Iceland, resulting in 35% to 40% of Iceland's minke whale catch being consumed by tourists visiting the country (WDCS, 2011c). The number of restaurants and shops now offering whale meat more than doubled between 2007 and 2009 (WDCS, 2011c). Iceland's whaling companies have also invested considerable effort recently into advertising the consumption of whale meat as an 'exotic' food (WDCS, 2011c). A similar situation occurs in Japan, where, despite the observed lack of popularity of whale meat, the government has developed subsidized school lunch programmes in order to promote its consumption amongst school children (Mulvaney & Taylor, 2013).

A number of caveats should be mentioned with respect to the methods employed for this study. It was assumed that the data gathered during the three months (June–August inclusive) of fieldwork were representative of all tourists visiting Iceland. Likewise, the data come only from tourists on board the boats of a single whale-watch company and operating from a single port. Reykjavik is host to the largest numbers of tourists in Iceland, and Elding, a well-established whale-watch company, has vessels that can carry up to 200 passengers, thus this approach allowed for a larger number of people to be sampled daily without requiring large numbers

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of personnel. The distribution of questionnaires only in English may also have excluded some respondents from the study, but English is the working language within the tourism industry in Iceland, and it was assumed, therefore, that at least one member of any given group would be able to fill in the questionnaire, which was purposefully worded in a simple way. The majority of distributed questionnaires were filled in (94.1%), suggesting that the study did sample an adequate representation of tourists on each whale-watching trip. Finally, this study presents data only from visitors who had chosen to visit Iceland, and thus it cannot represent the views of individuals whose decision not to visit was influenced by Iceland's whaling activities.

A recent study suggested that not only whale-watching tourists but also whale-watching operators in Iceland were concerned about their businesses overlapping with whaling activities (Wende & Gothall, 2008). The whaling and whale-watching industries, if truly incompatible, should both be examined in terms of their long-term sustainability, as well as the economic benefits each brings to Iceland. Whale-watching has proven to be a business capable of producing both environmental and considerable socio-economic benefits (Garrod & Fennell, 2004; Cisneros-Montemayor *et al.*, 2010; Parsons, 2012). However, as whale-watching can also have negative effects on whales (Garrod & Fennell, 2004; Parsons, 2012), the careful management of this form of tourism is essential if it is to be sustainable in the long-term. The economic costs and benefits of whaling are less clearly understood and the data required to assess these are not always available. An analysis of the costs related to the scientific whaling programme in 2003–2004 suggested that its total expenses exceeded any immediate monetary benefits (Siglaugsson, 2005a). According to a WDCS report (2011a), Iceland's scientific whaling cost nearly 30 million Icelandic króna (€182,050; €1 = 165 ISK (online conversion, 20 October 2013)) in 2003, and 78.9 million króna (€478,790) in 2006. A report issued by the Icelandic government predicted that fishing quotas for cod, haddock and capelin could be significantly increased if 150 fin whales and 150 minke whales were harvested annually (WDCS, 2011a). However, consumption of marketable fish stocks by cetaceans has been shown to be small relative to takes by commercial fisheries, and, likewise, harvesting of marine mammals is unlikely to increase the volume of fish available to fisheries (Corkeron, 2007; Morisette *et al.*, 2012). Alongside a limited local demand for whale meat, this raises questions regarding the true economic benefits of commercial whaling in Iceland. A cost–benefit analysis incorporating the financial costs and profits of the whaling industry, alongside the supposed potential financial gain to the fishing industry of reduced whale predation, would elucidate whether whaling does in fact benefit the Icelandic economy. However, the longer-term risks, such as changes in the structure of the marine ecosystem resulting from the removal of whales (summarized in Worm *et al.*, 2007), or the possible need for costly marine mammal conservation efforts to recover over-exploited populations, can be difficult to foresee and may be impossible to value financially.

This study provides insights into tourist perceptions of whaling and whale-watching, in a country where both industries operate side-by-side. It is apparent that tourist behaviour is not always in line with the opinions they voice, in this case regarding the consumption of whale meat. The presence of international tourists in Iceland who do not support whaling suggests that the boycott of a whaling nation may not be an action considered by some whale-watch tourists, perhaps because opinions relating to environmental issues such as whaling do not play a significant role in the choice of holiday destination, or because whaling is not an issue of primary concern for these tourists. However, the study provides data only on tourists who have already travelled to Iceland, and thereby excludes an unknown proportion of potential visitors who may have chosen to boycott Iceland because of its whaling activities. More research is required to address concerns relating to the persistence of whale populations alongside the resumption of whaling. The individual effects of whaling and whale-watching on local whale populations, and the compatibility of these two industries, must be addressed as a research priority in order to ensure the long-term viability of Iceland's cetacean populations.

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APPENDIX

Survey of whale-watching tourists towards whaling and whale-watching in Iceland

On the 1st of June 2009 the whaling (hunting of whales) season will start again in Iceland. This survey is meant to determine what you think about whale-watching, whaling and the coexistence of these two different activities in the same area. Please take a couple of minutes to fill in this questionnaire. It will help us to better understand your opinion about this issue.

Nationality:. . . . . **Age**: . . . . . .
Profession: . . . . . **Sex**: – Male – Female

1) Have you ever been to Iceland before? – Yes – No

2) What was the main reason(s) for you to come to Iceland?
– Culture – Landscape – Whale-watching
– Visiting friends – Work/Conference – Other

3) What do you do to help the environment?
– Recycling – Using energy saving light – Avoiding cosmetics tested on animal
– Avoiding to use the car when possible – Vegetarianism
– Other – Nothing

4) Have you ever been member of any environmental friendly organisation? – Yes – No
Which organisation:. . . . .
If yes: have you active member? – Yes – No

5) Have you ever been whale-watching before? – Yes – No
If yes, where: . . . .

6) Did the tour fulfil your expectations? – Yes – No – Partially
Why?
– Proximity to whales/dolphins – Crew members – Weather
– Time spent with whales/dolphins – Comfort – Other

7) Do you think whale-watching tours potentially can harm whales/dolphins? – Yes – No

8) Did you know before coming that Iceland practices commercial whale hunting?
– Yes, I knew it before coming – No, I knew after coming
– No, I'm discovering it filling up this questionnaire

9) Is this hunting a good reason not to come to Iceland? – Yes – No

10) Is this hunting a good reason not to go whale–watching? – Yes – No

11) What is your present opinion about whale hunting? – In favour – Against
For which reason: – Tradition – Science – Moral conviction – Whales are just animals
– Other: .....

12) What was your opinion about whale hunting before coming to Iceland? – In favour
– Against
For which reason: – Tradition – Science – Moral conviction – Whales are just animals
– Other: .....

13) If you changed your mind, for which reason?
– Whale–watching experience – Experiencing Icelandic culture – Having tried whale meat
– Other:..... .....

14) Do you think hunting might interfere with whale-watching operations? – Yes – No

15) Have you ever consumed whale meat?
– Yes – Not yet but I will – No, I will never try

16) Why would you consume whale meat?
– Curiosity – I like it – I would not consume it – Other

17) Do you think that whale meat consumption would support hunting? – Yes – No

18) Have you ever tried Puffin, Guillemot meat?
– Yes – Not yes but I will – No, I will never try

19) Do you see any difference in consuming whale or wild bird meat? – Yes – No

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