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## Who's watching whom? – an interdisciplinary approach to the study of seal-watching tourism in Iceland

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### ABSTRACT

Due to increasing interest in wildlife tourism, there is a growing need to consider the balance between use and protection of wildlife. Mutual exchange and acceptance of research results between different academic disciplines, such as wildlife ecology and tourism research, has until recently been scarce. Absence of discipline-independent guidance on the management of wildlife tourism, in combination with a lack of knowledge-transfer from academia to society regarding how human impact can be reduced, may contribute to unintended disturbance of wildlife. Here we present a methodology, where use and protection constitute equal importance within wild animal watching, by showing how a synergetic gain of combining knowledge from different academic disciplines may occur and be implemented in order to decrease potential human disturbance on harbour seals (*Phoca vitulina*). Further, we suggest that improved transfer of interdisciplinary research from academia to industry increases understanding of the wildlife tourism industry and has the potential to change tourist behaviour and hence minimise disturbance of wild animals. We exemplify this possibility by combining results from two case studies derived from biology and tourism research. The aim of both was to study potential human disturbance on harbour seals (*P. vitulina*) during land based seal-watching. The combined findings indicate that more attention should be paid to understanding and communicating the types of tourist behaviour likely to cause distress.

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## 1. Introduction

### 1.1. Growing interest for wildlife experiences

Interest in wildlife tourism has grown rapidly and it is now a fast growing sector of the tourism industry (e.g. Hoover-Miller et al., 2013). Higginbottom (2004) described wildlife tourism as any tourist activity that has wildlife as its primary focus of attraction and wildlife activities as either consumptive (e.g. hunting and fishing) or non-consumptive (e.g. wildlife watching). In this paper, we focus only on non-consumptive wildlife tourism. The underlying assumption of this work is that more detailed interdisciplinary exchange of research in biology and tourism would result in a synergetic impact on tourist behaviour within wildlife watching. The model will be exemplified by combining findings from two

previous case studies with origin from the two disciplines. Exchange between academia and the tourism sector can be a key factor regarding how to create a balance between use and protection when managing wildlife.

The necessity of interdisciplinary approaches to management of wildlife–tourist interactions has been recognized by several authors (Giannecchini, 1993; Moore et al., 2009; White and Alastair, 2010). The traditional approach has been to study tourist–wildlife interactions either from a natural or social science perspective (Liu et al., 2007) since the different disciplines usually focus upon different sides of the interactions. This division has prevented the development of sustainable solutions on how to manage a balance of the use and protection of wildlife.

The peripheries of the North Atlantic have become more accessible, especially farther north because of the effects of climate change, and wildlife tourism has now spread to remote locations (Dobson, 2008; Brouder and Lundmark, 2011; Hoover-Miller et al., 2013), to new animal species (Dobson, 2006; Lemelin and Dyck, 2008) and new contexts (Boncoeur et al., 2002; Orams, 2002; Gmelch, 2003; McElroy, 2003; Scarpaci et al., 2005). This interest

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has also resulted in a widened debate on how to balance use, and protection of, wildlife in remote areas, especially in the Arctic region (e.g. Hinch, 2001). The challenge is to balance the legitimate desire of visitors for close interaction with wildlife with the need to minimize human impacts on animals and ecosystems (Zeppel and Muloin, 2008). As an example of that challenge, McMinn (1997) highlighted the concept of carrying capacity, which tourism researchers borrowed from ecologists (Lickorish, 1991), referring to the maximum tourist population that a given destination can support without detrimental effects. It is, however, difficult to measure the overall general impact of tourists since each destination is unique with different factors to measure – often by extremely subjective criteria. This makes it hard to use carrying capacity as a planning instrument (Saarinen, 2003). Saarinen (2003) stressed that the concept of carrying capacity, unlike the concepts of sustainable tourism or sustainable development, does not ideologically or rhetorically imply or promise global or generational solutions but more time and space-specific solutions at the local level. Also, since many tourists behaving appropriately may sometimes have less effect compared to few tourists behaving inappropriately, it should be possible to increase the carrying capacity at a certain destination by manipulating the behaviour of tourists (Weaver and Lawton, 2006; Fredman and Wall-Reinius, 2012).

Wildlife-tourism systems, like all tourism systems, tend to have complex structures, including interrelations between tourists, tour operators, local residents, authorities and in this case also wild animals, each factor affecting the others in complicated manners. Due to this complexity, several different factors need to be included when attempting to manage wildlife tourism in a sustainable way (Duffus and Dearden, 1990; Orams, 2002; Catlin et al., 2011). Moore et al. (2009) defined different forms of integrative research between disciplines as multidisciplinary, interdisciplinary or trans-disciplinary.

Multidisciplinary research includes loose cooperation between different disciplines, where the knowledge is developed within the discipline rather than combined. Within interdisciplinary research, disciplinary boundaries are crossed and ideas developed with integrated knowledge of a common problem that cannot be broken down into separate solvable disciplinary parts. Further, the trans-disciplinary approach adds knowledge from society to interdisciplinary research and hence deals with the frequently acknowledged gap between science and society (Moore et al., 2009).

The stakeholder approach (Freeman, 1984) provides an example of a model for dealing with cooperations between several disciplines which can be applied to the sustainable management of wildlife tourism. Tourism destination planning depends on involvement from stakeholders representing public sector, tourism industry, local residents as well as special interest groups for example regarding hunting, yachting or trekking. A stakeholder has the capacity to participate in the process and can see that individual and/or mutual benefits might be derived from the process (Freeman, 1984; Gray, 1989; Terpstra and Simonin, 1993; Jamal and Getz, 1994; Timur and Getz, 2002; Getz and Nilsson 2004; Aas et al., 2005; Nilsson, 2007).

The network of stakeholders can be hierarchic where one has the greatest influence in the network and is in many respects independent of the others in the decision making process. Egalitarian networks are, contrary to that model, characterised by social relations, which allow equal power, possibly at the expense of decision making for the benefit of the whole group. It is however, not unlikely for egalitarian networks to exist at a destination as a subculture side by side with a hierarchic network (Freeman, 1984; Friedman and Miles, 2002; Getz and Nilsson, 2004).

## 1.2. Different approaches of tourism and biological research to tourist–wildlife interactions

It is well documented by biologists that the wellbeing and fitness of wild animals can be negatively affected by direct and indirect anthropogenic factors. Tourism has been described as a major cause of disturbance of animals (e.g. Constantine, 2001; Lusseau et al., 2006; Hoover-Miller et al., 2013) at both individual (Creel et al., 2002) and population level (Fernández-Juricic, 2000). Negative impacts on wild animals due to tourism have therefore been a focus for biological research on tourist–wildlife interactions (Duffus and Dearden, 1990; Nisbet, 2000; Catlin et al., 2011). Disturbance (defined by Nisbet, 2000) of wild animal populations can cause stress, leading to physiological responses among the animals, such as higher heart rate (MacArthur et al., 1982; Carney and Sydeman, 1999) and hormonal effects (Creel et al., 2002; Barja et al., 2007), and possibly behavioural changes. For example, disturbance can prevent wild animals from spending time involved in essential behaviour such as foraging (Tyler, 1991; Carney and Sydeman, 1999; Dans et al., 2008) or cause animals to spend more time engaged in behaviour that increases energy expenditure (Tyler, 1991; Christiansen et al., 2010, 2011). Human disturbance may also negatively affect rearing success; for example reducing the time females spend nursing their offspring (Kovacs and Innes, 1990) or resulting in females abandoning their young (Carney and Sydeman, 1999; Osinga et al., 2012).

In addition, changes in the spatial distribution of wild animals can be the result of anthropogenic impact, sometimes leading to animals abandoning breeding and resting sites, and instead choosing sites with less disturbance that in other aspects are less optimal for the animals (Cassini et al., 2004). Though in some cases animals may habituate to human presence (e.g. Boren et al., 2002; Burns and Howard, 2003; Burns, 2009), it is clear that tourism often affects both breeding success and overall survival rate of wild animals (Whoeler et al., 1994; Johnson and Lavigne, 1999). For example, Johnson and Lavigne (1999) identified tourism as among the most significant causes of the decline of the Mediterranean monk seal (*Monachus monachus*). A major problem faced in human–animal interactions is the difficulty in investigating long-term effects on animal populations and, once a long-term effect is recognized, it is often hard to repair (Duffus and Dearden, 1990). Consequently direct- and short term effects have usually been the focus of research.

In tourism research literature, wildlife tourism has until recently been regarded as an instrument for imparting minimum impact on nature, due to its presumed passive character (Higginbottom, 2004). The foregoing discussion between use and protection of wildlife questions, however, the minimal nature of such impact. A central question has been how to develop sustainable use of nature and wildlife (Hull, 2001; Burns, 2009; Burns et al., 2011) alongside ordinary people's need for access to nature and wildlife (Nilsson, 2002), in accordance with preservation needs. Other researchers have focused on how this right to access nature and wildlife reflects an inherent component of a vital democracy (Arler, 2003), or how to model plans for wise implementation of that right (Lindberg and Johnson, 1997; Lindberg et al., 2001; Bosetti et al., 2009). Much emphasis has been put on how to construct guidelines for human behaviour in a nature environment considering sustainable balance between use and protection (Grant, 2000; Hughey et al., 2004; Burns et al., 2011; Granquist and Nilsson, 2013).

## 1.3. Problems associated with wildlife-codes of conducts: why is there a need for an interdisciplinary approach?

Wildlife tourists are often aware of their potential disturbance and willing to reduce their potential impact (e.g. Muloin, 1998;

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