



Interpretation in wildlife tourism: Assessing the effectiveness of signage on visitor behaviour at a seal watching site in Iceland



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ABSTRACT

The effectiveness of interpretive signage as a means of modifying visitor behaviour to reduce negative impacts on wildlife was tested empirically at a seal watching site on Vatnsnes peninsula in North West Iceland. From July to September 2014, the actions of 2440 visitors were observed and their behaviour recorded. To test the importance of how interpretive information is presented, signs with either ontological (instructions without explanation) or teleological (instructions with explanation) information were positioned along the path towards the site. A control group, to which no signs were provided, was also observed. Our results show that the majority of the tested behaviour was influenced when signs were present and that under some conditions teleological signs were more effective than ontological. The type of visitor group was found to significantly influence behaviour, with families having the most intrusive behaviour compared to singles, couples or other groups. The findings of this study contribute to a better understanding of how interpretive signage can modify tourist behaviour to facilitate sustainable wildlife tourism. The use of teleological signs for managing wildlife tourism activities is recommended because they are more effective than ontological signs in terms of modifying the general visitor behaviour. In addition, signage and other management strategies should address the different needs and responses relevant to the nature of the tourist group visiting the site. Special focus should be placed on families when signs are designed because this group type showed the highest probability of causing disturbance at the site.

Management implications: In this paper we show that interpretation through signage can be a useful tool for sustainable development and management of wildlife watching. We recommend the following when designing interpretive signs:

- Visitors should be provided with teleological, rather than ontological, information.
- Signs should include illustrations with informative text.
- The information provided should take care to address families because they show the most intrusive behaviour.
- Information should be offered in multiple languages, as appropriate, to make information accessible to the greatest number of visitors.
- The content of the information should include practical information about wildlife protection, take home messages and comparisons between wildlife and humans to enable visitors to more readily establish a psychological connection with the wildlife. Although signage has many advantages, other methods for conveying information, such as guided tours with educated guides, are suggested as a way of supplementing signs.

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1. Introduction

1.1. Wildlife tourism in marine areas

Wildlife tourism involves an experience with non-domesticated animals, either in their natural habitat or in captivity. Urbanization has led to fewer wildlife encounters for many people in their everyday life, which in turn has increased the desire to watch and interact with wild animals when travelling (Higginbottom, 2004a; Newsome & Rodger, 2013). Interest in wildlife tourism is growing, in particular for some sectors within wildlife watching such as whale and bird watching (Cordell & Herbert, 2002; Higginbottom, 2004a; Hoyt & Hvenegaard, 2002; O'Connor, Campbell, Cortez, & Knowles (2009); Newsome & Rodger, 2013). In rural areas, wildlife tourism can enhance the economy and is considered an important industry within the tourism sector (Burns, 2004).

Tourism, however, can have both positive and negative effects upon wildlife. Possible positive effects include financial support for conservation, increased research, and education of visitors regarding wildlife (Higginbottom & Tribe, 2004; Reynolds & Braithwaite, 2001). These factors can enhance the protection of wildlife species and their habitats (McNeely, 2004) and improve the wildlife tourism experience. The presence of humans may however disturb and negatively impact wildlife. Such disturbance is often amplified by the increased number of visitors in the area and the intensity of their behaviour (Granquist & Sigurjonsdottir, 2014; Green & Giese, 2004). Disturbance of wildlife can lead to physiological effects among the animals; for example, increased heart rate (Carney & Sydeman, 1999; Giese, 1998) and hormonal effects (Barja et al., 2007; Creel et al., 2002). Disturbance may also lead to changes in the natural behaviour of animals; for example, animals may be forced to spend more time in behaviours that have high energy costs, such as fleeing, and at the same time spend less time in essential behaviour such as resting or feeding (Bejder, Samuels, Whitehead, & Gales, 2006; Christiansen, Lusseau, Stensland, & Berggren, 2010; Higham, 1998). Such effects may ultimately result in lowered fitness among the animals, and changes in their distribution.

1.2. Pinniped tourism

Pinnipeds are fin-footed marine mammals and include all species of seals, sea lions and walruses (Newsome & Rodger, 2007). Pinnipeds are key species in wildlife tourism due to their temporal and spatial predictability of occurrence (Boren, Gemmill, & Barton, 2002; Cassini, Szteren, & Fernández-Juricic, 2004; Pavez, Muñoz, Inostroza, & Sepúlveda, 2011). In many areas pinniped tourism, as a part of marine wildlife tourism, has high economic value (Kirkwood et al., 2003). Although pinniped tourism is becoming more popular, regulatory frameworks based on research are often lacking (Curtin, Richards, & Westcott, 2009; Kirkwood et al., 2003).

Behavioural changes of seals due to human disturbance include increased vigilance (Granquist & Sigurjonsdottir, 2014), flushing into the water, and abandonment of haul-out (resting) and/or breeding sites (Newsome & Rodger, 2007). Further, disturbance during the nursing period may lead to separation between female and pup or cause disrupted suckling, which could ultimately decrease the weaning weight and potentially reduce the survival chances of the pup (Kovaacs & Innes, 1990; Osinga, Nussbaum, Brakefield, & de Haes, 2012; Renouf, Lawson, & Gaborko, 1983).

In Iceland, tourism has recently undergone enormous growth with the number of visitors travelling to Iceland tripling from 2010 to 2016 (Icelandic tourist board, 2016). A main reason cited for visiting Iceland is to explore nature and in 2014 almost 230,000 tourists went on a whale watching trip during their stay in Iceland (Icelandic tourist board, 2016; IceWhale, 2016). Although not as popular, seal watching tourism is also growing rapidly and seal watching sites are being developed in many areas of Iceland to cater for this demand

(Granquist & Sigurjonsdottir, 2014).

1.3. Interpretation as a management tool

Numerous strategies can be employed to reduce visitor disturbance of wildlife. These include restricting visitor numbers, implementing protected areas, providing economic incentives, and interpretation (Higginbottom, 2004b). As defined by Moscardo, Woods, and Saltzer (2004): "Interpretation broadly refers to educational activities used in places like zoos, museums, heritage sites and national parks, to tell visitors about the significance or meaning of what they are experiencing" (Moscardo et al., 2004, p. 231). It is used as a tool to both enhance visitor experience and manage their behaviour (Bramwell & Lane, 1993) and thereby reduce their disturbance on wildlife (Ham & Weiler, 2002; Higginbottom, 2004b). Interpretation is often conveyed via guides, books, shows, brochures and signs and can lead to visitor engagement with conservation issues (Moscardo et al., 2004). Roberts, Mearns, and Edwards (2014) describe the goals of interpretation as being to (1) ensure visitor satisfaction, (2) increase visitor knowledge, (3) achieve attitude change and, consequently, (4) achieve behavioural change.

Many wildlife tourism visitors are eager to support and follow behavioural guidelines (Curtin et al., 2009; Granquist & Sigurjonsdottir, 2014; Nilsson, 2012) and some studies have shown that visitors like, or even expect, to receive information during their wildlife experience (Lück, 2007). Thus, providing information about wildlife and their ecology and defining appropriate visitor behaviour could fulfil visitor expectations and thereby increase their satisfaction with the experience (Curtin et al., 2009; Lück, 2007). Support for, and compliance with, guidelines, however, also depends on their design: wording, message content and the manner of conveying information (Ballantyne, Packer, & Hughes, 2009; Jacobs & Harms, 2014; Moscardo et al., 2004).

1.3.1. Signage

Signs with interpretive information are prevalent in both captive and non-captive wildlife tourism settings (Moscardo et al., 2004). Some studies have investigated whether or not interpretation and signage effectively change visitor's behaviour and increase compliance with regulations (Acevedo-Gutiérrez, Acevedo, Belonovich, & Boren, 2011; Hueneke & Baker, 2009; Hughes, 2013; Park, Manning, Marion, Lawson, & Jacobi, 2008; Roberts et al., 2014). Empirical studies thoroughly investigating how providing interpretive information changes visitor behaviour in non-captive wildlife tourism settings are, however, lacking. So too are studies which test the effectiveness of information with explanation (teleological information) on visitor behaviour against information without explanation (ontological information) (Granquist & Nilsson, 2016). Where studies have been conducted, there is usually no control group, as reported in Jacobs and Harms (2014). Furthermore, most studies use surveys of self-reported visitor's behaviour or intentions as an indicator for the effectiveness of interpretation tools and do not study actual behavioural change (Hueneke & Baker, 2009; Hughes, 2013; Jacobs & Harms, 2014; Orams, 1997). Hughes (2013) found that intentions of behavioural change might not necessarily result in an actual change of behaviour. Therefore, in contrast to previous studies this present study tests directly the effects on visitor behaviour as a consequence of the provided information. An important contribution of this study is that it provides evidence of actual change in visitor behaviour.

1.4. Aim

The aim of this study was to assess if interpretation of signage at wildlife tourism sites leads to a behavioural change of visitors. We also examine how visitors respond and behave when receiving teleological guidelines compared to ontological guidelines. Furthermore, visitor

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