



Contents lists available at ScienceDirect

Journal of Environmental Management

journal homepage: www.elsevier.com/locate/jenvman

Review

Effects of non-consumptive wildlife-oriented tourism on marine species and prospects for their sustainable management

Shelley Burgin ^{a, *}, Nigel Hardiman ^{b, 1}^a Faculty of Society and Design, Bond University, Gold Coast 4229, Australia^b University of Kent, School of Anthropology and Conservation, Canterbury Campus, Kent CT2 7NZ, United Kingdom

ARTICLE INFO

Article history:

Received 4 December 2014

Accepted 6 December 2014

Available online

Keywords:

Marine wildlife tourism

Wildlife management

Sustainable management

Animal behaviour modification

Wildlife provisioning

Recreation management

ABSTRACT

Marine non-consumptive wildlife-oriented tourism, whereby tourists observe and/or interact closely with animals, without purposely having a detrimental effect on them, has been growing globally in recent decades. Human-mediated feeding (provisioning) is widely used by tour operators to attract target species, facilitate viewing and interaction with tourists. Although potential effects of such provisioning on terrestrial fauna have been given moderate scientific research attention, equivalent research in the marine environment is limited. Effects of provisioning marine wildlife may include direct habituation, behavioural change, and/or dietary impacts among individuals and species. There may also be disruption to the species associated assemblage. It was found that the literature on the effects of non-consumptive wildlife tourism is fragmented and results from different areas and taxa are frequently contradictory. Most studies appeared to be of a few years duration, at most. This reflects the relative immaturity of the industry – many enterprises studied typically commenced within the 1990s. Studies (other than fish) tended to focus on a focal species with few addressing the wider implications for the associated assemblage. Supplementary feeding may also have impacts on the health and wellbeing of provisioned animals. It is concluded that such nature tourism is often not benign – focal species and their assemblage are often disrupted. We conclude that funding to better understand the impacts and thus address them is imperative. To supplement funding for the research and monitoring required, an additional charge could be incorporated into the fee charged to those engaging in marine wildlife tourism.

© 2014 Elsevier Ltd. All rights reserved.

1. Introduction

Non-consumptive wildlife-oriented tourism, whereby tourists observe wildlife, often at close quarters, without purposeful detrimental effects on the targeted individuals, has grown substantially over several decades (e.g., Bejder et al., 2006a; Davis et al., 1997; Duffus and Dearden, 1990; Hammerschlag et al., 2012; O'Malley et al., 2013). Viewing may be opportunistic or focused on a specific species. While the opportunistic approach is well established in the terrestrial environment (e.g., safaris in Africa since the 19th century), focused viewing of fully aquatic, marine species is more recent (Badalamenti et al., 2000; Bruce and Bradford, 2013; Milazzo et al., 2002; O'Malley et al., 2013; Orams, 2002, 2004). However, in

comparison to terrestrial animals, marine species may be difficult to observe (Austin et al., 2004; Hammerschlag et al., 2012). To maximise interaction (including viewing) with fully aquatic marine species, provisioning has increased in popularity in recent decades, particularly for difficult-to-observe animals (Bruce and Bradford, 2013; Maljković and Côté, 2011; Newsome et al., 2004; Orams, 2002).

Social, economic, and environmental benefits may emanate from provisioning. These benefits may include enhanced public awareness (Clua et al., 2010a; Laroche et al., 2007; Smith et al., 2010), and revenue for the maintenance of protected areas/biodiversity/local communities (Birtles et al., 2002; Brookhouse et al., 2013; Milazzo et al., 2006; Orams, 2002; Steckenreuter et al., 2012a; Vianna et al., 2012). However, assessment of the biological effects on marine fauna is limited (Maljković and Côté, 2011; Newsome et al., 2004; Orams, 2002). In addition to the scientific literature on the topic being published in tourism-specific journals (e.g., Brookhouse et al., 2013; Catlin and Jones, 2010; Davis et al., 1997; Gallagher and Hammerschlag, 2011), relevant papers on

* Corresponding author. Tel.: +61 7 5595 2189; fax: +61 7 5595 1474.

E-mail address: sburgin@bond.edu.au (S. Burgin).¹ Current address: Business School, Top Education Group, 1 Central Avenue, Eveleigh 2015, USA.

marine wildlife provisioning also appear in other discipline-focused journals. These include journals with a focus on fisheries/marine studies (e.g., Barber et al., 2000; Brunnschweiler and McKenzie, 2010; Martin, 2007), conservation/environmental management (e.g., Bejder et al., 2006a; Constantine et al., 2004; Knip et al., 2012; Steckenreuter et al., 2012a), and biology/ecology (e.g., Beale and Monaghan, 2004; Bejder et al., 2006b; Dill et al., 2003; Vianna et al., 2012).

Most studies on this type of tourism have focused on dolphins (e.g., Bejder et al., 1999, 2006a,b; Constantine et al., 2004; Mustika et al., 2012; Samuels and Bejder, 2004; Steckenreuter et al., 2012a, b), whales (e.g., Aragones et al., 2013; Birtles et al., 2002; Lundquist et al., 2013; O'Connor et al., 2009), dugongs, manatees (e.g., Hodgson and Marsh, 2007; Nowacek et al., 2004), sharks, and rays (e.g., Maljković and Côté, 2011; Martin, 2007; O'Malley et al., 2013; Semeniuk and Rothley, 2008). They have also tended to be short-term, not more than a few years (southern stingrays – *Dasyatis americana*, Semeniuk et al., 2007, 2009; killer whale *Orcinus orca* – Williams et al., 2002, 2006), and typically concerned with direct impacts (e.g., avoidance behaviour – dolphin *Tursiops truncatus*, Constantine, 2001; Lusseau and Higham, 2004; whales – Lundquist et al., 2013; Orams, 2000).

Despite the popularity of non-consumptive wildlife-oriented tourism, there is limited consensus about its management (Bruce and Bradford, 2013), even within a single group (e.g., sharks – Clua et al., 2010a). In this paper, we briefly discuss i) the extent of non-consumptive wildlife-oriented tourism in the marine environment before considering ii) potential effects of supplementary provisioning of marine pelagic wildlife; and finally iii) we pose the question is non-consumptive wildlife-oriented tourism detrimental?

2. Extent of non-consumptive wildlife-oriented tourism

In 2002, Newsome et al. (2002) reported that the increase in non-consumptive viewing of pelagic marine wildlife had been 'explosive'. The increasing participation rate was confirmed by others (e.g., Bruce and Bradford, 2013; O'Connor et al., 2009; Vianna et al., 2012). For example, O'Connor et al. (2009) reported that in 2008, globally 13 million people participated in viewing/swimming with cetaceans (whales, dolphins, porpoises; i.e., 'whale watching'), an increase of 30.5% compared to 1998. With whale watching established in 119 countries and serviced by an estimated 3000 commercial tour operators, it was already a global industry. The regions with the highest participation were North America (48.2%) and the Oceania, Pacific Islands and Antarctica Region (19.1%), with an increased participation of 12.1% in the decade 1998–2008 for North America, and 60.6% for the Oceania, Pacific Islands and Antarctica Region. Others regions also recorded substantial growth (e.g., Europe, 49.5%; Central America and Caribbean, 69.9%). In 2008, direct global expenditure on whale watching was estimated at USD 2.1 billion, up from USD 1.0 billion in 1998 (O'Connor et al., 2009). The growth in whale watching has been paralleled by the growth in other marine megafauna viewing with sharks and rays particularly popular (Vianna et al., 2012). For example, O'Malley et al. (2013) reported that manta ray watching occurred across 23 countries and attracted some USD 213 million annually.

Viewing and/or diving with sharks also occurs globally, with 376 dive-with-sharks tour operators in 83 locations (Gallagher and Hammerschlag, 2011) offering an estimated 500,000 tourists opportunities for close-up encounters with sharks annually (Topelko and Dearden, 2005). The experiences range from interacting with the 'gentle giant' whale shark *Rhincodon typus* (Catlin et al., 2010; Catlin and Jones, 2010; Quiros, 2005; Rowat and Engelhardt, 2007) to 'adrenaline' experiences, either in protective cages or in

open water, with large species including tiger shark *Galeocerdo cuvier* (Dicken and Hosking, 2009) and the white shark (*Carcharodon carcharias* – Hara et al., 2003; Laroche et al., 2007). Shark tourism also continues to increase in popularity (Clua et al., 2011; Fitzpatrick et al., 2011; Gallagher and Hammerschlag, 2011; Hammerschlag et al., 2012; Orams, 2002; Smith et al., 2010; Topelko and Dearden, 2005). The income from these activities contributes millions of dollars annually to local and regional economies (Topelko and Dearden, 2005; Vianna et al., 2012). For example, at Port Lincoln (South Australia), the only white shark cage diving industry in Australia, the industry grew from an average 67 days per year prior to 1997 to 287 in 2011 when it was estimated that approximately 5200 passengers spent USD 5.28 annually to view the white shark (Bradford and Robbins, 2013).

While reliable information on the global economic value of whale shark/shark watching/diving is sparse, regional data suggest it is substantial. For example, whale shark diving has generated between an estimated annual USD 4.3 (Davis et al., 1997) and USD 5.28 (Catlin et al., 2010) million in revenue in Ningaloo Marine Park (Australia), and USD 5.0 million in the Seychelles (Rowat and Engelhardt, 2007). Sicklefin lemons shark *Negaprion acutidens* viewing off French Polynesia was reported to generate USD 2.6 million in 2011 (Clua et al., 2011), while in Palau, Vianna et al. (2012) reported that shark-diving tourism generated some USD 18 million annually and accounted for 8% of the Gross National Product of the country. Off South Africa, white shark cage-diving was reported to generate USD 3.1 million (Gansbaai region – Hara et al., 2003), and tiger shark diving USD 1.3 million (Aliwal Shoals – Dicken and Hosking, 2009).

Non-consumptive marine wildlife recreation has typically been the purview of commercial operators. However, particularly in coastal waters, use of privately-owned recreational vessels has been increasing dramatically in most economically developed countries (Buckstaff, 2004; Burgin and Hardiman, 2011). In parallel, the use of private vessels to view marine wildlife has also increased (e.g., polar regions – Erbe, 2002; Jelinski et al., 2002; Orams, 2010). Together with whale-watching vessels, Wiley et al. (2008) suggested that whale-watching from privately-owned vessels presented substantial challenges for management, despite interaction with whales being restricted to viewing (i.e., not provisioning).

3. Wildlife provisioning and associated effects

3.1. Provisioning

To maximise close animal-tourist encounters, provisioning of marine pelagic species has become popular among tour operators (Brunnschweiler and Baensch, 2011; Brunnschweiler and Barnett, 2013; Clua et al., 2010a; Dobson, 2006; Foroughirad and Mann, 2013). However, the practice is controversial (Brunnschweiler and Baensch, 2011; Foroughirad and Mann, 2013; Laroche et al., 2007; Maljković and Côté, 2011; Meyer et al., 2009), and is banned/restricted in many marine protected areas (Brunnschweiler and Baensch, 2011; Hawkins et al., 1999; Orams, 2002; Semeniuk and Rothley, 2008). However, it remains widespread, for example, throughout tropical and subtropical seas (Brunnschweiler and Barnett, 2013; Clua et al., 2010a) and the activity is growing (Ponzo et al., 2013).

Shark provisioning has been particularly contentious (Brunnschweiler et al., 2014; Brunnschweiler and Barnett, 2013; Brunnschweiler and Clua et al., 2010a,b; Dobson, 2006; Orams, 2002), and has been banned in many areas (e.g., Florida, Hawaii, US – Hammerschlag et al., 2012; Maljković and Côté, 2011; Cayman Islands and South Africa – Maljković and Côté, 2011), with pressure for wider bans (Topelko and Dearden, 2005). However, shark-

Download English Version:

<https://daneshyari.com/en/article/7482806>

Download Persian Version:

<https://daneshyari.com/article/7482806>

[Daneshyari.com](https://daneshyari.com)