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A rejoinder to comments on 'Swim encounters with killer whales (*Orcinus orca*) off northern Norway: interactive behaviours directed towards human divers and snorkellers obtained from opportunistic underwater video recordings'

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Introduction

This is a reply to the comments on our research note, 'Swim encounters with killer whales (*Orcinus orca*) off northern Norway: interactive behaviours directed towards human divers and snorkellers obtained from opportunistic underwater video recordings', authored by G. Bertella and M. Acquarone, and published in the *Journal of Ecotourism* Vol. 16 (2). In response to our article, the commenters reflected on:

- (1) the concepts of sustainability and ecotourism;
- (2) the researchers' position in terms of animal ethics;
- (3) the relevance of the empirical context in which the field work occurred and the related research ethics; and
- (4) the difficulty of evaluating the risk of injury.

The commenters argue that these aspects are particularly relevant to wildlife tourism research and were not addressed appropriately in our research note. Before we reply to each of these criticisms in turn, we would like to clarify that our study had a behavioural research focus. We described behaviours of unhabituated killer whales being addressed towards human snorkellers and divers during open-water encounters, and we pointed out why this research is important. We chose a research note as the final format because (a) we believe that we were addressing a hot topic and had discovered something that has not been explored before in the literature and (b) our data quantity is small, and thus cannot serve as the content of a full paper. As a consequence of our format choice, we were not able, or regarded it as inappropriate, to cover in detail background information about related topics such as those being pointed out by the commenters. Had we included these, the manuscript would have been nearly twice as long and would have significantly exceeded the maximum word count for research notes. Because we are sure the commenters are aware of this, we do not perceive their comments as criticism but rather that they confirm our research is indeed a hot topic. Consequently, we welcome the comments as they now give us the opportunity to broaden our position on swim-with programmes

(SWPs) in general, and specifically with free-ranging killer whales in northern Norway. We will reply according to the four themes of concern to the commenters; however, we will focus on aspects that have a management dimension, or that refer to anthropogenic impact aspects.

Aspects of our research addressed by commenters

The concepts of sustainability and ecotourism

We selected the *Journal of Ecotourism* to publish our research because whale watching has been branded in the recent literature as ‘sustainable’ and promoted as ‘ecotourism’, while, at the same time, has been criticized in other publications as lacking the attributes required for sustainable ecotourism (Neumann & Orams, 2006; Ramage, 2009; Samuels & Bejder, 2004; Tiitmamer Kur & Hvenegaard, 2012). We agree that SWP, as an integral sector of commercial whale-watching activities, is a non-lethal consumptive activity (Higham, Bejder, Allen, Corkeron, & Lusseau, 2016). This is a shift from a former definition as non-consumptive by Barstow (1986) when among Western societies whale watching was regarded as a commercial alternative to whaling. We claimed that SWPs can be a sustainable and environmentally friendly activity. We define ‘sustainable’ as not negatively affecting the health status, population parameters or behaviour of the target species, neither in the short term nor in the long term, as a result of SWP activities. And, we claim the activity is ‘environmentally friendly’ by excluding (acoustical and chemical) pollution as a result of boat presence and manoeuvres (e.g. exhaust fumes, motor and propeller noise of vessels, waste flow). We addressed neither economic nor social aspects in detail as we did not collect data that targeted such issues. However, we pointed out that economic sustainability is essential for market development. And that, this is limited in the area by a strong seasonality of killer whale occurrence, fluctuations in animal abundance, the location’s remoteness, and uncomfortable weather and sea conditions.

The commenters made the criticism that we did not address the educational value of whale-watching activities and its potential to influence tourists’ attitudes. We want to add accordingly that SWPs can have a strong positive impact on customers’ conservation attitudes that is even more profound than among participants of boat-based excursions (Lück, 2003, 2015, 2016). Furthermore, SWPs can positively change customers’ perception of animal characteristics (O’Neill, Barnard, & Lee, 2004).

In the discussion of our research note, we introduced globally applied management strategies for SWPs, and, although we did not detect negative impacts in our study, we do not exclude the possibility of banning SWPs in the area as a result of a precautionary management strategy. We think that local deciders should choose a pro-active form of management regime rather than, as is mostly the case in other areas, a reactionary strategy to control (or to not control) market developments (see section 3) in response to proven negatively anthropogenic effects.

The researchers’ position in terms of animal ethics

Motivated by a strong desire to get up close to a dolphin, an increasing number of people seek out tourism activities offering SWPs. Valentine, Birtles, Curnock, Arnold, and

Dunstan (2004) showed that the swimmers' encounter satisfaction strongly correlates with their spatial proximity to dolphins. The closer they can get, the more satisfied they will be. Eye-contact, touch, food-provisioning, close proximity, and the perception of the dolphins' sonar are further key factors for satisfaction (Curtin, 2006; DeMares, 2000; Muloin, 1998; O'Neill et al., 2004; Wiener, 2013). Here, managers are confronted with conflicting agendas: customers want to be as close as possible to the animals, while environmentalists want to establish regulations preventing customers from approaching too close (Knight, 2009; Wiener, 2013). We completely reject SWPs in closed settings with captive animals or at food-provisioning sites as they are controlled, lack physical space, prevent animals from avoidance, include physical touch, and allow food-provisioning (e.g. Warkentin, 2011; Yerbury, Boyd, Lloyd, & Brooks, 2017). In this context, customers learn anthropocentric attitudes (e.g. being 'kissed' by a dolphin; or being approached by a dolphin because a trainer has given the order to initiate such a behaviour; or that it is natural that free-ranging animals are food-provisioned) and ignore the price the animals have to pay. A major difference of SWPs in natural open-water settings is the animals' freedom of choice. Though it is reasonable to assume that customers prefer to be exposed to affiliative behaviours and would not feel comfortable experiencing aggressive, threatening, or sexual behaviour, the behavioural quality during SWPs with wild and unhabituated animals is unpredictable. Thus, we would conceptualize SWPs with free-ranging and unhabituated animals as wild and non-anthropocentric. However, the relationship between habituated animals and humans can change over time (e.g. Knight, 2009) and might favour behaviour that cannot be found among unhabituated animals.

The discussion on the appropriateness of SWPs is, rather, a discussion about whether animals should be used as wildlife attractions and whether there is a human right to use animals for recreation, leisure, and tourism (e.g. Yerbury et al., 2017). However, as wildlife tourism has evolved into a huge global market (including Norway), and therefore cannot be generally banned, a recently suggested alternative is to empower customers to follow animal welfare and conservation strategies and to foster ethical consumption (Moorhouse, D'Cruze, & Macdonald, 2017). A key problem is that tourists have no information about what negative impacts could result from their participation. Next to qualified customer education, we would strongly recommend governmental market control, as pointed out in section 3 of our research note, as we think that ethical considerations have no impact on the speed of or pressure for implementing regulations. We further disagree with the commenters' suggested strategy of developing non-enforceable guidelines 'that could assist the operators'. As we argued in section 3, in many cases operators are not cooperative, self-regulation often triggers non-compliance, and, which is most relevant, non-enforceable guidelines stop communities from further developing enforceable regulations.

Research on SWPs has recently been conducted in areas where they have previously been banned for many years (e.g. Scheer, Alves, Ritter, Azevedo, & Andriolo, 2014; Scheer, Hofmann, & Behr, 2004); this research had to be authorized by the Spanish government and the researchers' presence in the water was not misused for non-compliant behaviour among local operators. In our own research, we followed a code-of-conduct to limit potential disturbance to the animals during our approaches, and deliberately limited the overall number of approaches by using already existing video material

which had been recorded recently by other persons. Our research note was not a feasibility study to promote, implement, or increase commercial SWPs on site. Our study was a collection and characterization of unpredictable and uncontrollable killer whale behaviours that a swimmer, snorkeler, or diver is potentially confronted with during SWPs in an open-water environment. Though our video data span a period of 15 years and aggressive or sexual behaviours have been absent from our observations, further studies might reveal additional behaviours.

To make SWPs more predictable and manageable, it is essential to know the quality and quantity of behaviours that might occur during in-water interactions. Swimmers who have little or no SWP experience are in danger of misinterpreting behaviours (e.g. they might not recognize threatening behaviours which could result in violent and injuring behaviours), and should be prepared with information before swim contact is initiated. Swimmers might be trained to recognize affiliative, aggressive/threatening, or sexual behaviours so that they can decide whether to continue or terminate their encounters accordingly, and also to avoid own behaviours which could elicit undesirable responses from the animals. Inappropriate human behaviours (such as approaches that are too close, approaches towards calves, touch or touching attempts, teasing with objects or fish, and splashing) have been reported to potentially elicit aggressive/threatening behaviours (for a review, see Scheer, 2010), or to prevent swimmers from having underwater visual contact with the animals (Neumann & Orams, 2006). Thus, our study provides baseline data for management decisions, represents a supporting document for long-term monitoring, and delivers data for educational and regulatory measures.

The relevance of the empirical context in which the fieldwork occurred and the related research ethics

The whale-watching market (including SWPs) in northern Norway is growing and unregulated (Bertella, 2017; O'Connor, Campbell, Cortez, & Knowles, 2009). Excursions are conducted by an increasing number of commercial operators and private recreationists (Bertella, 2017; Bertella & Vester, 2015). At the time this study began (January 2015), there did not exist any form of (voluntary) regulation or governmental control over this activity. As the first author attended as a volunteer at the local non-governmental organization Ocean Sounds (where the field study was originally planned to be located) in 2014, the regulatory processes initiated among local stakeholders, pointed out by the commenters, were neither foreseeable nor communicated. However, as Ocean Sounds was involved in regulation efforts on site (Bertella, 2017), Pagel, Scheer, and Lück (2017) could have been a supporting document to inform management as it is so far the only on-site scientific study dealing with behavioural effects occurring between whale watchers and killer whales in Norway.

The evolutionary anatomy of whale-watching markets has been described as stereotypical, and its temporal development can span decades. It starts with the discovery phase (5–10 years) and runs through the stages of competition (up to 10 years), confrontation, and hopefully stabilization (Forestell, 1992). We feel that the local situation in Norway can be identified as competition, as it displays the features that this phase is characterized by: an increase in the number of operators, upgrades in infrastructure, market differentiation, competitive behaviour among operators, global informal reach (journalism, websites,

social media), unfavourable marketing ('we bring you closer'; picture language on promotional material), and price dumping (Forestell, 1992). Furthermore, and this is a critical factor for future developments, local economic dependencies have arisen.

Recently, two effective management strategies have been applied to SWPs: a ban following a precautionary approach (e.g. Allen, 2014; Gobierno de Canarias, 1995); and a proactive one regulating markets by governmental control (e.g. Allen, 2014; Birtles, Arnold, & Dunstan, 2002; Heenehan et al., 2015; Kessler & Harcourt, 2012; Martinez, Orams, & Stockin, 2010). Quite recently, Western Australia was planning to implement SWPs with humpback whales in Ningaloo Marine Park by launching an SWP feasibility study (Department of Parks and Wildlife, 2016). However, a global review of 58 whale-watching codes of conduct found that swim-with activities were prohibited in 34.5% of them (Garrod & Fennell, 2004). A key problem for SWPs and for commercial whale watching in general is that enforceable regulations and governmental controls are mostly absent when markets arise, and by the time they are proposed local communities have already become dependent on the income. As a result, governments attempting to introduce controls at a later stage have to politically balance local economy and environmental protection, but are commonly rather keen to promote tourism for jobs and economic growth (Moorhouse et al., 2017). The commenters have initiated favourable discussions among local stakeholders but it has also been pointed out that local whale-watching companies on-site engage only marginally in debates (Bertella & Vester, 2015), and some operators disagree with license and sanction systems (Bertella, 2017). This might be a sign that the confrontation phase of the markets' evolution is beginning, as mistrust between operators, environmentalists, researchers, and government representatives are often the precursors (Forestell, 1992).

Though self-regulation is usually initially the only option for introducing guidelines – and can be the precursor for governmental control – self-regulation (which means rules without sanctions and enforcement) is questionable because operators often fail to comply with it (Allen, Smith, Waples, & Harcourt, 2007; Scarpaci, Dayanthi, & Corkeron, 2003; Sitar et al., 2016; Whitt & Read, 2006). The commenters cited a website showing proposed regulations which were also communicated by a press release; however, customers are often not aware of these regulations unless they are presented both on site and before or during the excursions (Lopez & Pearson, 2017). Thus, customers are not empowered to influence non-compliance among operators.

The commenters were critical that we did not specify whether our cited operators were professional or not. Although professionalism has, of course, an influence on the quality of the excursions and on the compliance with regulations, foreign customer behaviour would not change: they are searching the internet for local operators and are mostly driven by price. In order to differentiate compliant operators on site and in the media, it would be more transparent for customers if they could rely on a licensing system or seal of approval issued by the government or an independent certification programme. Furthermore, promoting and reviewing websites could foster 'green consumption' (Moorhouse et al., 2017).

More rigorous protection can effectively be achieved under governmental legislation, and a ban on SWPs may be the result. The commenters were critical that we had conducted a study addressing SWPs, even though this activity is discouraged in Norway by local guidelines. We strongly respond to this by arguing that currently operators can

still continue with their business practices without being sanctioned. As stated by Allen (2014, p. 40), 'management regimes have typically been implemented on a reactionary basis as a result of perceived or measured impacts'. Although SWPs are often discouraged by governmental bodies and NGOs, they still continue to be offered. Indeed, globally there is an increase in SWPs. For most species and locations, there is still a lack of scientific evidence for detrimental outcomes. Thus, scientific studies, such as ours, are essential steps for investigating and monitoring SWPs. In this context, our research activity cannot be in conflict with local DMO efforts, as it should serve to initiate management activities. We further argue against the commenters' fear that operators might 'collect and sell data from underwater whale encounters'. As we did not pay for the videos used for analysis, and have never heard of colleagues doing this, this is an unrealistic scenario.

The difficulty of evaluating the risk of injury

The commenters cited a part of our introduction incorrectly, and limit the possibility of potential injury during SWPs solely for the animals in focus. However, we stated that there is a risk for injury to both animals and tourists. While threats to animals involved in tourism activities are widely discussed in the literature, potential impacts of wildlife on tourist safety (including being bitten, stung, hit, or charged) remain understudied (Moscardo, Taverner, & Woods, 2006). In this context, we examined the self-initiated behaviours of killer whales in response to the presence of human swimmers and divers.

As stated in our research note introduction, swimmers and divers are often in close and uncontrolled contact with the animals in their open-water environments, and exposed to unpredictable behaviours. Although there is a general popular belief that cetaceans are friendly and peaceful animals, free-ranging cetaceans have been reported to aggressively interact with human swimmers and even injure or kill them (Shane, Tepley, & Costello, 1993, for short-finned pilot whales; Santos, 1997, for bottlenose dolphins). On the other hand, targeted animals have also been shown to approach swimmers in a non-aggressive, affiliative way (e.g. Birtles et al., 2002, for dwarf minke whales; Scheer et al., 2004, for short-finned pilot whales; Martinez, Orams, Pawley, & Stockin, 2012, for Hector's dolphins; Pagel et al., 2017 for killer whales). Furthermore, in open waters human swimmers and divers are confronted with natural oceanographic conditions such as currents, swell, limited underwater visibility, and sometimes low water temperatures. Swimmer group compositions are often heterogeneous: swimmers show varying gear use experience, physical fitness, psychological stability, and encounter expectation (Amante-Helweg, 1996; Birtles et al., 2002; Valentine et al., 2004; personal observations). For the development of a sustainable whale-watching industry, regulations should be implemented in order to satisfy demands and to prevent both human swimmers and the target species from any health risks.

One important prerequisite for the introduction of such regulations is the knowledge of what behaviours might occur. Swimmers who have little or no encounter experience are in danger of misinterpreting behaviours (e.g. they might not recognize threatening behaviours, potentially culminating in violent and injuring behaviours); however, if information about what behaviours may occur is available, they can be prepared before swim contacts are initiated. Birtles et al. (2002), for example, showed that more than 21% of swimmers did not expect to get that close to Minke whales during in-water

encounters. For management purposes, swimmers could be instructed in advance about which behaviours might occur and be given an indication of approach distances. They might be trained to recognize aggressive, threatening, sexual, or affiliative behaviours so that they can choose whether to terminate or to continue their encounter accordingly.

Allen (2014) pointed out that SWPs have proven contentious among researchers, managers, and operators. We think that during SWPs a given target species has the choice to spatially approach and stay with swimmers, or to avoid them (see also Dudzinski, 1998; Scheer, 2010). Furthermore, once dropped in the water, swimmers are relatively immobile and are too slow to follow, and animals can maintain their 'safety' distance (Martinez et al., 2010). Higher risks arise from boats trying to drop tourists close to a group (e.g. Filby, Christiansen, Scarpaci, & Stockin, 2017) or in a travelling group's path. While unfavourable swimmer placement increases avoidance among animals (Constantine, 2001; Martinez et al., 2010) as a short-term form of harassment, intense and permanent tour vessel activity was shown to elicit declines in abundance as a long-term consequence (Bejder et al., 2006; Lusseau, 2004). The commenters proposed the measurement of changes in killer whale population abundance in the area in order to detect the potential impacts of the whale-watching industry. While this is a promising indicator likely to induce local management activities, we did not refer to this because the most recent data were obtained between 1986 and 2003, and thus were relatively outdated (Kuningas, Similä, & Hammond, 2014). Furthermore, these authors' study sites do not match our observation area.

Thus, there are no data to show that most recent or current whale-watching activities have an impact on abundance. However, in opposition to the commenters stating that there are no technical means to determine the effects of human activities on killer whales in the area in question, researchers can gather baseline information and may detect short-term consequences. As stated by Scheer (2010), for SWPs it might be that reports did not describe the whole behavioural repertoire for a specific species and location, and certain behaviours occurred but were not reported. Pagel et al. (2017) acknowledged the small amount of data used in their study, and remarked that further observations might reveal additional and perhaps threatening behaviours. Next to the detection of negative behavioural effects during SWPs, monitoring of market activities (boat and tourist numbers, direct and indirect expenditures) and the potential short-term impacts of boat manoeuvres (e.g. swimmer placements, changes in killer whale activity budgets, surface behaviours, collisions, propeller injuries) would help in identifying other negative aspects of the local whale-watching market.

Conclusions

The commenters provided critical thoughts about our research note, and we welcome critical discourse on this topic. While we appreciate the commenters' position on a number of points made, we strongly disagree with the view that our study may hinder local management activities among stakeholders. In fact, as this was the first scientific behavioural study on whale-watching activities at this specific site, the findings of our study provide valuable data that can help shape the future management of SWPs in the area. As at most other SWP locations, local management regimes are typically reactionary and baseline, and impact studies are essential to induce enforceable governmental

regulations. We stress that we provide data for management activities and material for the initiation of educational activities for both customers and operators. In this context, we put our research methodology and standards in place using globally applied strategies.

Disclosure statement

No potential conflict of interest was reported by the authors.

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