

# Wildlife-based tourism: Edging slowly towards sustainability?

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## Introduction

This article addresses a series of recent events that we argue collectively represent a paradigmatic shift in the way commercial tourism encounters with dolphins are managed. They also represent a significant step towards sustainable dolphin-based tourism. These events coalesced around a ministerial decision that is to our knowledge unprecedented in terms of proactive management of tourist interactions with cetaceans. The wider significance of this development became apparent at the 2<sup>nd</sup> National Wildlife Tourism Conference (Fremantle, Western Australia, 13-15 August 2006). The conference represented the intersection of three timely events; (i) the completion and reporting of a five year programme of research (which drew upon over fifteen years of data collection) monitoring the impacts of commercial tourism at Shark Bay, Western Australia (Bejder 2005; Bejder et al., 2006a, 2006b) (ii) the subsequent ministerial decision (Minister for the Environment, Western Australia) in response to the research and (iii) a draft resolution from delegates at the National Wildlife Tourism Conference supporting that ministerial decision. This article overviews these developments and considers their significance in terms of the sustainable management of wildlife tourism, both in Australia and elsewhere. It also notes that Shark Bay, a well managed site of relatively low level commercial dolphin-watching activities, carries important insights that should not be ignored, particularly when extrapolated to the many high-intensity dolphin-tourism sites around the world.

## Tourist engagements with dolphins – the search for sustainability

Three decades have passed since Budowski (1976) wrote that tourism and conservation may exist in a relationship of conflict, coexistence or symbiosis, and that most commonly the relationship is one of conflict, or coexistence moving towards conflict. Since that time many words have been both spoken and written to the effect that tourism may contribute in meaningful ways to conservation, i.e. there is perhaps potential for symbiosis (Beaumont, 2001; Orams, 1997; Tarrant and Cordell, 1997; Higham and Carr, 2002), but thirty years after Budowski (1976), examples of genuine symbiosis remain the exception rather than the rule. In many parts of the world the evidence for symbiosis between tourism and conservation interests is either nonexistent or, at best, worryingly obscure (Higham, 2007). One could be forgiven for thinking that, at least at the present time, coexistence is the best that can be hoped for.

Within the broad field of nature-based tourism, this appears to be particularly true of wildlife-tourist interactions (Duffus and Dearden, 1990; Higham 1998). The interactions of wildlife populations with tourists have, rather belatedly, become acknowledged for their complexity (e.g., in reference to tourist engagements with cetaceans, see Beale & Monahan 2004; Bejder et al., 1999; Bejder et al, 2006c; Constantine, 2001; Corkeron, 2004; Gill et al. 2001; Williams et al., 2002). Herein lies a critical test for tourism sustainability.

The recent 2<sup>nd</sup> Australian National Wildlife Tourism Conference which was hosted by Wildlife Tourism Australia (WTA) and the Forum Advocating Cultural and Eco- Tourism (FACET) took place in Fremantle, Australia in August 2006. The conference explored issues surrounding the development and long-term sustainable management of wildlife tourism in more critical detail than previously. It succeeded in highlighting and exploring a range of key issues that are central to the sustainability of wildlife-based tourism. These included

the dynamic nature of tourist engagements with wildlife as tourism develops over time (Dearden, 2006) and the complexity of achieving rigorous insights into wildlife responses to anthropogenic pressure, particularly in relation to long-term biological significance (Bejder et al., 2006a, 2006b, 2006c).

Two clear conclusions to emerge from the conference were (i) that it is only with rigorous scientific research that we can begin to understand the complex relationship that prevails when tourists engage with wild animals (individual animals or populations of animals) and, (ii) managers must be responsive to the outcomes of rigorous science. These outcomes were clearly articulated in a series of draft resolutions which were developed at the conclusion of the conference to actively influence the legislative and managerial context for wildlife tourism in Australia (Wildlife Tourism Australia, 2006). One paper, which reported on a five year monitoring research programme at Shark Bay (Western Australia), contributed to the drawing of these conclusions with particular intensity (Bejder et al., 2006a, 2006b).

### **Tourism at Shark Bay (Western Australia)**

The dolphins of Red Cliff Bay, and particularly those who visit Monkey Mia, Shark Bay, are of extreme economic significance to the local community. Monkey Mia receives over 100,000 visitors annually, 69% of whom come primarily to see dolphins (Reark Research 1995; Stoeckl et al. 2005). Since the 1960s, several dolphins have received fish handouts from humans at a beach in Monkey Mia (Connor & Smolker 1985). At present, five adult female dolphins are provisioned with strict supervision by wildlife rangers. Vessel-based dolphin watching also occurs in the Red Cliff Bay area off Monkey Mia. One commercial dolphin-watching tour vessel has been operating within Red Cliff Bay since 1993. A second license application was approved in 1997 by the Marine Parks and Reserve Authority and by the Minister for the Environment. In August 1998, the then Department of Conservation and Land Management (CALM), now Department of the Environment and Conservation (DEC), made a license available to the second commercial tour-vessel operator.

When the second commercial dolphin-watch permit was issued in 1998, the Marine Parks and Reserve Authority proposed that CALM carry out research and monitoring to assess the potential impacts of additional commercial and recreational dolphin-watching vessels on dolphins off Monkey Mia. In response to this visionary decision, a four year research programme commenced in April 2000, partly funded by the two license holders via license fees and by CALM. In December 2000, when both licenses were renewed for three years, both operators were advised that further license renewal applications would be conditional upon consideration of the results of the research and monitoring of possible impacts. Subsequently, both licenses were renewed until December 2005 while the research was being completed.

### **Shark Bay dolphin research**

Investigations of anthropogenic disturbance often must generate time-sensitive information under crisis conditions. However, investigators regularly fend off issues of scale, both in time and space, problems in research design and a lack of baseline data for comparative analysis (Bejder and Samuels 2003). Studies evaluating the effects of human activity on wildlife typically emphasize short-term behavioural responses, from which it is difficult to infer biological significance or formulate plans to mitigate harmful impacts (Lusseau and Higham, 2004).

Fortunately the bottlenose dolphin population of Shark Bay is one of the best-studied cetacean populations in the world (e.g., Smolker *et al.* 1992; Connor *et al.* 1992; Connor and Smolker 1995; Connor *et al.* 1999; Mann *et al.* 2000; Krützen *et al.* 2003). At this location dolphin research commenced in 1984, nine years prior to the advent of vessel-based dolphin-watching in the area. Significantly, data were available both before and during vessel-based dolphin-watch tourism and at two tourism levels (control and tourism sites); and there existed identifiable subsets of the population with very different levels of encounter with tour vessels. This provided for before/after and control/impact comparisons – a powerful research design referred to as a ‘BACI’ design (Before-After-Control-Impact) that monitors impact variables over time and space in response to stimuli (Underwood 1991, 1992). By choosing adjacent tourism and control sites, it is unlikely that differences in changes in impact measures between sites and time periods are attributable to confounding factors (e.g., changes in prey or predator abundances) since the effects of such would likely influence both adjacent sites similarly (Bejder et al., 2006b). This allowed for the documentation of long-term responses to an expanding dolphin-watch tourism industry in the area.

## Research outcomes

Based on decades of detailed behavioural records, dolphin abundance was compared within adjacent 36km<sup>2</sup> tourism and control sites, over three consecutive 4.5-year periods wherein research activity was relatively constant but tourism levels increased from zero, to one, to two dolphin-watch operators. When comparing periods of no-tourism and one-operator within the tourism site, there was no change in dolphin abundance per km<sup>2</sup>; however, as tour operators increased to two, there was a significant average decline of 14.9% in dolphins per km<sup>2</sup>, approximating a decline of one per seven individuals. Concurrently, within the control site, there was a non-significant average increase of 8.5% in dolphins per km<sup>2</sup>. While acknowledging that research vessels are likely to have contributed to documented effects, it was concluded that, given the substantially greater presence and proximity to dolphins by tour vessels relative to research vessels, tour vessel activity was identified as the more significant contributor to declining dolphin numbers within the tourism site (Bejder 2005; Bejder et al., 2006a, 2006b).

The local decline was not part of an overall population decline because an opposite trend occurred in the adjacent non-tourism site, and the local decline was not explained by ecological factors, which would have had equivalent effects in the adjacent control site. Possible between-site differences in immigration or mortality could not be discounted, and differential recruitment via reproduction is under investigation. Specifically, analyses indicate that the female dolphins with high exposure to tour vessels are less successful at reproducing compared to the lower-exposed females (Bejder, 2005). Although this trend would not jeopardize the large, genetically diverse Shark Bay dolphin population, the decline in dolphin abundance and decreased reproductive success of exposed females was deemed unlikely to be sustainable for local dolphin tourism. Recommendations based on these results included imposing a moratorium on research permits and reducing the current exposure of dolphins within the tourism area to tour-vessels by 50%. It was proposed that, in theory, a range of management options were available to reduce the current level of exposure of individual dolphins to tour vessels. However, a feasibility analysis would be needed in order to evaluate which of these options are most viable ethically, practically and financially.

Management options that were proposed for consideration included to:

1. maintain the number of licensed tour operators and the number of trips offered per day per operator, but restrict the number of trips that can occur within the tourism area;
2. maintain the number of licensed tour operators and the number of trips offered per day per operator, but restrict the allowable time with animals within the tourism area;
3. maintain the number of licensed tour operators, but decrease the number of trips allowable per operator per day;
4. reduce the number of licensed tour operators;
5. eliminate all tour vessel activity.

## The ministerial decision

Both the Department of Conservation and Land Management and the Marine Parks and Reserves Authority considered the research findings and the options to reduce exposure of dolphins to tour vessels and provided advice to the Western Australian Minister of the Environment. After careful consideration and consultation with CALM, MPRA, the existing license holders, other dolphin researchers and stakeholders, Mark McGowan, the Minister of the Environment decided, among other things, upon the following:

- a) reduce the number of commercial dolphin-watch licenses from two to one;
- b) introduce a moratorium on any increase in research vessel activity in the effected area (Ministry Media Statement, 2006)

The Minister of the Environment clearly stated that the Monkey Mia tourism industry was largely based on the dolphin experience and the withdrawal of one license was a necessary sacrifice for the long-term sustainability of the area. An expression of interest process is currently being undertaken to determine the sole operator (Naturebase, 2006). Significantly, the 2<sup>nd</sup> Australian National Wildlife Tourism conference delegation supported the ministerial decision of July 2006 in its conference resolutions (Wildlife Tourism Australia, 2006).

In Shark Bay the dolphin-watching tourism industry is licensed and controlled, yet measurable impact over a relatively brief period has been documented. If the findings at this site of low-level tourism are extrapolated to

the many high-level tourism sites around the world (e.g., killer whales in British Columbia, Canada (Williams et al., 2002) bottlenose dolphins in the Bay of Islands, New Zealand (Constantine et al., 2004) and bottlenose dolphins in Port Stephens, Australia (Allen et al., in press) one might conclude that cetacean-based tourism is not be as low-impact as previously presumed. Given the scarcity of studies with adequate controls or longevity to fully evaluate tourism impacts, a cumulative impact, like that detected in Shark Bay, will probably go unnoticed for many years, perhaps decades, if detected at all. Thus, management deliberations must draw strong inference from the best-documented sites, such as Shark Bay, where long-term, individually specific information can be taken into account.

There are perhaps signs to suggest that the paradigmatic shift observed at Shark Bay, and the warning signalled in the previous paragraph, may be adhered to at other international sites where tourist activity focuses on engagement with cetaceans. A long-term monitoring programme focused on reducing interference of resting schools of spinner dolphins (*Stenella longirostris*) in Kealakekua Bay (Hawaii) is currently being established by State of Hawaii Department of Land and Natural Resources (DLNR) which has received approval to establish a temporary human exclusion area (HEA) over a 12 month-period (Ania Driscoll-Lind and Jan Östman-Lind, pers. comm). After a one year trial period, DLNR will implement a more permanent management protocol, which may include the continued use of a human exclusion area. At the same time a recent Advanced Notice of a Proposed Rule (ANPR) generated by the National Marine Fisheries Service (NMFS) Protected Resources Division will present the creation of exclusion zones as one possible management rule to be added to the US Marine Mammal Protection Act. This rule will be specific to spinner dolphins in Hawaii (Ania Driscoll-Lind and Jan Östman-Lind, pers. com).

Lusseau's (2004) research on a small and genetically isolated population of bottlenose dolphins (*Tursiops* spp.) in Doubtful Sound (New Zealand) also clearly demonstrates the complexity of managing tourist interactions with dolphin populations. His research identifies critical behaviours, namely resting and socialising, that are commonly discontinued when dolphins are accompanied by tour vessels (Lusseau & Higham, 2004). The clear conclusion is that the regions where these critical behaviours most commonly take place must be protected from anthropogenic interference. The small and genetically isolated character of this population of bottlenose dolphins adds to the urgency of appropriate management responses. While no such responses have yet been forthcoming, the opportunity to follow the Shark Bay example (Bejder et al., 2006a, 2006b; Ministry Media Statement, 2006), and enact management initiatives that are responsive to robust scientific research findings in pursuit of long-term sustainability, clearly exists.

## Conclusion

Recent research, socio-political decision-making, tourism management and conference outcomes in Western Australia represent a series of critical developments in our understanding of the sustainable management of wildlife tourism. We argue that collectively these developments represent a paradigmatic shift in accepting that wildlife tourism can be unsustainable. The ministerial decision taken by Mr. McGowan (Minister of the Environment) in 2006 may be unprecedented in a wildlife tourism context. It represents a socio-political complement to a science programme in which a demonstrated negative impact on cetaceans was considered to be unacceptable. This differs significantly from what Fennell and Ebert (2004) refer to as the 'precautionary principle'. In this case scientific rigour in research and monitoring has replaced the need for a precautionary approach borne from ignorance or uncertainty surround the critical elements of tourism that are likely to determine long-term sustainability.

The 2<sup>nd</sup> National Wildlife Tourism Conference draft resolutions contribute to the same end. They were developed with the intention that they guide research and advocacy as well as inform state/federal decision making relating to wildlife tourism in Australia. The resolutions include support for the ministerial decision relating to dolphin-based tourism in Shark Bay (FACET, 2006). These developments represent a competitive advantage for the continuing development of wildlife tourism in Western Australia. To our knowledge they demonstrate a greater commitment to sustainable wildlife tourism, and the protection of animal populations from impacts of tourism development, than anywhere else in the world currently.

However, it is important to note that Shark Bay is unique in many important respects. It is a geographically remote site, where a relatively small industry is supported by excellent science and where a robust legislative context provides for an advanced management regime (i.e., a rigorous system of operator licensing). This is a rare combination, indeed relatively few sites internationally are subject to robust legislation and sound management, and fewer still are afforded the benefits of good science. Nonetheless it is likely that in time the

events reported in this paper will justifiably be recognised as representing a major threshold in thinking regarding the long term sustainability of wildlife tourism. Such a significant advance has been at least thirty years in the waiting.

## References

- Beaumont, N. (2001) Ecotourism and the Conservation Ethic: Recruiting the Uninitiated or Preaching to the Converted? *Journal of Sustainable Tourism* 9(4): 317-341.
- Allen, S., Constantine, R., Bejder, L., Waples, K and Harcourt, R. (Accepted) 'Can't sleep, can't eat - let's split': Indo-Pacific bottlenose dolphin responses to tour boats in Port Stephens, Australia. *Journal of Cetacean Research and Management*.
- Beale, C. M. & Monaghan, P. 2004b. Behavioural responses to human disturbance: a matter of choice. *Animal Behaviour*, 68, 1065-1069.
- Bejder, L., Dawson, S.M. & Harraway, J.A. 1999. Responses by Hector's dolphins to boats and swimmers in Porpoise Bay, New Zealand. *Marine Mammal Science*. 15(3): 738-750.
- Bejder, L. & Samuels, A. (2003). Evaluating impacts of nature-based tourism on cetaceans. In *Marine Mammals: Fisheries, Tourism and Management Issues* (eds N. Gales, M. Hindell & R. Kirkwood), pp. 229-256. CSIRO Publishing, Collingwood.
- Bejder, L., Samuels, A., Whitehead, H., Gales, N., Mann, J., Connor, R., Heithaus, M., Watson-Capps, J. and Flaherty, C. 2006a. Decline in relative abundance of bottlenose dolphins (*Tursiops* sp.) exposed to long-term disturbance. *Getting real about wildlife tourism*. Proceedings, 2<sup>nd</sup> National Wildlife Tourism Conference. Fremantle, Western Australia. 13-15 August 2006. p. 30.
- Bejder, L., Samuels, A., Whitehead, H., Gales, N., Mann, J., Connor, R., Heithaus, M., Watson-Capps, J., Flaherty, C and Krutzen, M. 2006b. Decline in relative abundance of bottlenose dolphins (*Tursiops* sp) exposed to long-term disturbance. *Conservation Biology* 20 (6): 1791–1798
- Bejder, L., Samuels, A., Whitehead, H. and Gales, N. 2006c Interpreting short-term behavioural responses within a longitudinal perspective. *Animal Behaviour*. 72, 1149-1158
- Bejder, L. 2005. Linking short and long term effects of nature-based tourism on cetaceans. Ph.D. thesis, Dalhousie University.
- Connor, R.C., Smolker, R.A., & Richards, A.F. (1992). Two levels of alliance formation among male bottlenose dolphins (*Tursiops* sp.). *Proceedings of the Natural Academy of Science*, 89, 987-990.
- Connor, R.C., Heithaus, M.R., & Barre, L.M. (1999). Superalliance of bottlenose dolphins. *Nature*, 397, 571-72.
- Constantine, R. 2001. Increased avoidance of swimmers by wild bottlenose dolphins (*Tursiops truncatus*) due to long-term exposure to swim-with-dolphin tourism. *Marine Mammal Science* 17 (4): 689-702.
- Constantine, R., D. H. Brunton, and T. Dennis. 2004. Dolphin-watching tour boats change bottlenose dolphin (*Tursiops truncatus*) behaviour. *Biological Conservation* 117:299-307.
- Corkeron, P. 2004. Whale watching, iconography, and marine conservation. *Conservation Biology*, 18, 847-849.
- Dearden, P. 2006. Effects of participating in wildlife tourism: A case study from diving. In: *Conference Program: The 2<sup>nd</sup> Australian Wildlife Tourism Conference, 13-15 August 2006*. Promaco Conventions, WA.
- FACET (2006). Conference resolutions. *Getting real about wildlife tourism*. Proceedings, 2<sup>nd</sup> National Wildlife Tourism Conference. Fremantle, Western Australia. 13-15 August 2006. [www.facet.asn.au](http://www.facet.asn.au) Accessed 23 February 2007).

- Fennell, D.A. and Ebert, K. 2004. Tourism and the precautionary principle. *Journal of Sustainable Tourism*, 12(6): 461-479.
- Gill, J. A., Norris, K. & Sutherland, W. J. 2001. Why behavioural responses may not reflect the population consequences of human disturbance. *Biological Conservation*, 97, 265-268.
- Higham, J.E.S. 1998. Tourists and Albatrosses: The dynamics of tourism at the Northern Royal Albatross Colony, Taiaroa Head, New Zealand *Tourism Management* 19(6):521-533.
- Higham, J.E.S. (Ed). 2007. *Critical Issues in Ecotourism*. Oxford: Elsevier Butterworth Heinemann.
- Higham, J.E.S. & Carr, A. 2002. Ecotourism visitor experiences in Aotearoa/New Zealand: Challenging the environmental values of visitors in pursuit of pro-environmental behaviour. *Journal of Sustainable Tourism* 10(4): 277-294.
- Krützen, M., Sherwin, W.B., Barre, L.M., Connor, R.C., Van de Castele, T., Mann, J., & Brooks, R. (2003) Contrasting relatedness patterns in bottlenose dolphins (*Tursiops* sp.) with different alliance strategies. *Proceedings of the Royal Society - Series B: Biological Sciences.*, 270, 497-502.
- Lusseau, D. 2004. The hidden cost of tourism: Detecting the long-term effects of tourism using behaviour information. *Ecology and Society*. 9(1): 2.
- Lusseau, D. & Higham, J.E.S. 2004. Managing the impacts of dolphin-based tourism through the definition of critical habitats: The case of bottlenose dolphins (*Tursiops* spp.) in Doubtful Sound, New Zealand. *Tourism Management* 25(5): 657-667.
- Mann, J., Connor, R.C., Barre, L.M., & Heithaus, M.R. 2000 Female reproductive success in bottlenose dolphins (*Tursiops* sp.): Life history, habitat, provisioning, and group size effects. *Behavioral Ecology*, 11, 210-219.
- Ministry Media Statement. 2006. <http://www.mediastatements.wa.gov.au/media/media.nsf/news/958A19167C70F7934825719900206D69>. Accessed 17 August 2006.
- Naturebase (2006). [http://www.naturebase.net/tourism/pdf\\_files/mm\\_eoi\\_guidelines\\_04072006.pdf](http://www.naturebase.net/tourism/pdf_files/mm_eoi_guidelines_04072006.pdf). Accessed 17 August 2006.
- Orams, M. B. (1997). "The effectiveness of environmental education: can we turn tourists into 'greenies'?" *Progress in Tourism and Hospitality Research* 3: 295-306.
- Quartermain, R. 2006. Electronic monitoring of ecotourism operations. *Getting real about wildlife tourism*. Proceedings, 2<sup>nd</sup> National Wildlife Tourism Conference. Fremantle, Western Australia. 13-15 August 2006. p.65.
- Reark Research. 1995. Summary report of the findings of the Shark Bay visitor survey. A report for Shark Bay Tourism Committee. Western Australian Department of Conservation and Land Management, Shire of Shark Bay, and Monkey Mia Dolphin Resort, Denham, Australia.
- Smolker, R.A., Richards, A.F., Connor, R.C., & Pepper, J.W. (1992) Sex differences in patterns of association among Indian Ocean bottlenose dolphins. *Behaviour*, 123, 38-69.
- Stoeckl, N., Smith, A., Newsome, D. & Lee, D. 2005. Regional economic dependence on iconic wildlife tourism: Case studies for Monkey Mia and Hervey Bay. *The Journal of Tourism Studies*, 16, 69-81.
- Tarrant, M. A. and H. K. Cordell. 1997. "The Effect of Respondent Characteristics on General Environmental Attitude-Behaviour Correspondence." *Environment and Behaviour* 29(5): 618-637.
- Underwood, A.J. (1991) Beyond BACI: experimental designs for detecting human environmental impacts on temporal variations in natural populations. *Australian Journal of Marine and Freshwater Research*, 42, 569-588.
- Underwood, A.J. (1992) Beyond BACI: the detection of environmental impacts on populations in the real, but variable, world. *Experimental Marine Biology and Ecology*, 161, 145-178.

Williams, R., Trites, A.W. & Bain, D. 2002: Behavioural responses of killer whales (*Orcinus orca*) to whale-watching boats: opportunistic observations and experimental approaches. *Journal of Zoology* 256: 255-270.