

MARINE WILDLIFE AND TOURISM MANAGEMENT

**Insights from the Natural and
Social Sciences**

To George, Gus and Will
and
To Jette

MARINE WILDLIFE AND TOURISM MANAGEMENT

Insights from the Natural and
Social Sciences

Edited by

James Higham and Michael Lück



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1

Marine Wildlife and Tourism Management: In Search of Scientific Approaches to Sustainability

J.E.S. HIGHAM AND M. LÜCK

Introduction

The marine environment encompasses two-thirds of the surface of the 'blue planet' (Lück, 2007a). From inshore environments, such as estuaries, lagoons, atolls and reef systems, mud flats and mangroves, to the pelagic environments of the open oceans, the marine environment has become, albeit relatively belatedly (Orams, 1999), a major venue for tourism and recreation. Many marine environments, such as the North Atlantic Gulf Stream and the Antarctic convergence, boast high biomass and fantastic arrays of wildlife. Marine wildlife ranges from the complex ecologies of the Great Barrier Reef (Coral Sea) – coral reefs support over 25% of all known marine species (International Coral Reef Information Network, 2002) – to the Southern Ocean, where one link in the food chain is all that separates the smallest one-cell organisms from the largest animal on earth (see Maher, Chapter 16, this volume).

It is remarkable, then, that nature-based marine tourism has so recently become the subject of tourist attention. While marine environments have long been, and continue to be, venues for exploration, subsistence, transport and communication, merchant trade and conflict, recreation and tourist attention have relatively recently turned to the pursuit of marine experiences. Excursions to coastal resorts in Great Britain date to the 1850s, and beach holidays to the 1930s, following the unveiling of the bikini on the cover of *Vogue* magazine in 1929. The phenomenon of holidays at Mediterranean and Caribbean coastal and island resorts and destinations dates from the 1950s (Bramwell, 2004), and cruise shipping, exclusively the domain of the rich and famous in the early 20th century, has experienced a renaissance since the 1990s (Lück, 2007b).

In recent decades the spatial expression of marine tourism has expanded far beyond coastal resorts and the beach as a setting for leisure and recreation.

Forming an important part of this process, appreciation of and demand for marine wildlife experiences are recent developments. Viewing whales in the wild, for example, originally dates to the early 1950s, but the growth of commercial whale watching, along with other forms of non-consumptive wildlife-based marine tourism, has burgeoned since the 1980s (Hoyt, 2000). The scuba phenomenon and, as a consequence, a growing appreciation of the need to protect fragile marine ecologies also date to the 1980s (Bennett *et al.*, 2003).

Perhaps as a consequence of this belated development context a full appreciation and adequate conservation of marine environments remains largely unfulfilled. While the establishment of terrestrial national parks, initially Yellowstone National Park (USA), dates to the 1870s, the designation of marine protected areas (MPAs) remains a work in progress. For example, over one-third of New Zealand's land area has been designated for conservation (much of it in a system of national parks), yet less than 1% of New Zealand's extensive marine environments has been incorporated into a system of marine reserves (Department of Conservation, 2007). New Zealand's first marine reserve (Cape Rodney – Okakari Point Marine Reserve) was established in 1975 and was one of the world's first no-take marine reserves. There are now 28 marine reserves established in New Zealand waters with the majority initiated by applications lodged by groups such as the indigenous *tangata whenua*, conservation groups, fishers, divers and marine science interest groups (Department of Conservation, 2007).

However, 99% of the total area designated as New Zealand marine reserves lies in two extremely remote offshore island groups: Kermadec Island to the far north of New Zealand and the Auckland Islands to the far south. The Department of Conservation (2007) notes that 'of New Zealand's total marine environment, just 0.3% is protected in marine reserves'. This situation still exists despite the Department of Conservation's intention to incorporate 15% of New Zealand's marine environments into MPAs. Canada, which boasts the longest coastline of any nation (244,000 km), adopted an 'Oceans Action Plan for Present and Future Generations' as recently as 2005. This document notes in its foreword: 'Our oceans are important and represent an opportunity to make a greater contribution to our well-being and to benefit from the protection of critical marine environments' (Government of Canada, 2005, p. 3).

Prior to the Romantic movement of the 19th century, wilderness areas in Europe and North America were seen as cursed and chaotic wastelands (Oelschlager, 1991). In many respects marine environments are still seen in discriminatory terms. Many see marine environments as threatening, unpredictable and dangerous, not to mention home to some of the world's last great and least understood predators (see Dobson, Chapter 3, this volume). Although efforts to protect the megafauna and the great predators of terrestrial environments are well established, again, protection of their marine counterparts is belated and not so well advanced. The large-scale hunting of whale populations continued unopposed until the 'Save the Whales' campaigns of the 1970s (Barstow, 1986; Dalton and Isaacs, 1992), and in some countries the slaughter and exploitation of whales and dolphins continue even today.

Diversity of Marine Tourism

Yet, despite infuriatingly slow progress towards a new marine environmental paradigm, tourist interests in marine experiences and the growing diversity of marine tourism is perhaps evidence of the emergence of such a paradigm. Tourism activities that are set in coastal and marine environments have evolved far beyond the traditional passive leisure experiences of the classic resort holiday. While the traditional beach holiday remains a contemporary mass tourism phenomenon (Bramwell, 2004), marine tourism now extends beyond beach activities to a wide spectrum of activities, such as scuba-diving and snorkelling, windsurfing, jet skiing, fishing, sea kayaking, visits to fishing villages, marine parks and aquaria, sailing and motor yachting, maritime events and races, and the cruise ship industry, among others (Lück, 2007a). This list makes no specific mention of the tourists and their activities that are the focus of this book – those who specifically access marine environments to observe and appreciate marine wildlife.

Such has been the pace of growth in demand for marine tourism that visitor numbers, development of private sector tourism businesses and issuing of permits and consents, as well as outfitting of private recreational interests, have forged ahead of legislative and management responses aimed at sustainability. As such, marine recreation and tourism has, at least for the time being, been added to a lengthy list of interests that essentially treat the marine environment as a common pool resource to be exploited or otherwise used in the interests of personal gain or other reward.

Marine Environments: A Common Pool Resource

Today, as in the past, the vast majority of the global human population lives in close proximity to coastal areas. According to Burke *et al.* (2002), more than 350 million people live within 50 km of the coast in South-east Asia. Historically this has been due to the high biomass of riverine, estuarine and other littoral environments, making coastal areas strategically important in terms of the diversity and relative abundance of annual and seasonal subsistence resources. While this remains critically important in many parts of the world, coastal areas additionally offer strategic advantages in terms of communications, transport, commercial development of marine resources, indigenous claims for exclusive access to traditional marine resources, lifestyle, recreation and tourism. Thus, in terms of tourism as well as all other forms of human use and exploitation of the marine environment, the neritic (inshore) and pelagic (ocean) environments of the world remain, and have become, an increasingly contested, common pool resource.

Consequently, there exist manifold examples of resource use conflict in the marine context. The plunder of marine resources continues unabated in many parts of the world. Stocks of large fish species such as bluefin tuna (*Thunnus thynnus*) (one of the most prized fish at risk of overfishing), and long-lived species such as

orange roughy (*Hoplostethus atlanticus*) and Patagonian toothfish (*Dissostichus eleginoides*) have been exploited to the very brink of collapse (Ellis, 2003). Efforts to establish Southern Ocean fishing rights and catch sizes led to the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) in 1980. However, a sustainable toothfish industry remains dubiously improbable. The seabird by-catch of longline fisheries and the indiscriminate destruction of non-target species such as sea lions and diving birds by drift and set nets remain unresolved. However, it should be acknowledged that the 'tragedy of the commons' (Hardin, 1968) also applies in many instances of marine wildlife-based tourism development.

Whale Watch: The Vanguard of Marine Wildlife Tourism

Commercial whale watching dates to the 1950s and originated in Baja California/Mexico and Hawaii (Tilt, 1987). Since then whale watching has proliferated into boat, land and airborne interactions with all 83 species of whales, dolphins and porpoises (Hoyt, 2000). The phenomenal growth in popularity of whale watching post-dates the mid-1980s. Whale and dolphin activities in Australia and New Zealand became major tourist activities from the late 1980s (Orams, 1999) and since then similar activities have become commercially available in destinations such as Indonesia, Hong Kong, Fiji, Tonga and the Solomon Islands (Lück, 2007a). In Asia, similar patterns of growth have occurred in the 1990s. Although in 1994, no whale watching whatsoever took place in Taiwan, in 1998, 30,000 people engaged in whale watching in that country. Despite a whale- and dolphin-hunting industry that is both highly visible and highly contentious internationally, whale and dolphin experiences have also become big business in Japan. An average annual growth rate of 37.6% between 1991 and 1998 demonstrates the rapid ascension of the whale-watching phenomenon in Japan. By 1998, more than 100,000 people sought whale- and dolphin-watching experiences in Japan, and spent nearly US\$33 million in doing so (Hoyt, 2000).

Such rates and patterns of growth may be viewed as encouraging in terms of conservation, but they also raise intriguing questions relating to resource use conflicts. Thus, while whale hunting continues to be practised in Japan and Norway, these countries have also seen the development of significant whale-watching industries in recent years. Norway formally objected to the International Whaling Commission's moratorium which was set in 1986, and therefore never stopped hunting Minke whales. By contrast, whale watching began in Iceland in 1991, and within 3 years the number of whale watchers rapidly approached 10,000 per annum. By 1999, this number exceeded 30,000 and in 2001 over 60,000 people engaged in whale-watching activities (E. Hoyt, 2001; World Wide Fund for Nature, 2003). In 2002/03, the year in which the Icelandic government announced its intention of resuming scientific whaling, this period of rapid growth in whale watching came to an abrupt end (Higham and Lusseau, 2008). Thus, it is timely for researchers in the social science disciplines to address complex resource use issues such as the impacts of whale hunting (be it commercial, scientific or traditional/indigenous) on the whale-watching industry.

Of course, in the intervening years a diverse range of other marine wildlife viewing experiences have also grown in prominence, each associated with different global, national and regional environmental, resource conflict and conservation issues. These include viewing wading and migratory birds, marine mammals (from cetaceans and pinnipeds to polar bears), coral reef ecologies, species of great albatross, penguins and sharks. With each new manifestation of tourist engagements with marine wildlife come new and unique conservation and tourism management challenges.

Seeking the Insights of Natural Science

Tourist interactions with marine mammals on a regular basis can have detrimental effects on both focal animals and the health of local animal populations. While some science has paid attention to the impacts of tourism on wild animals, a comprehensive understanding of impacts is incomplete. Constantine (1999, p. 14) states that since 'the development of commercial dolphin watching and seal watching is a relatively new occurrence in most places, information on the effects of tourism on these animals is limited'.

The management of tourist interactions with cetaceans is a case in point. A range of rigorous publications concerning possible impacts on cetaceans in different regions and contexts has emerged (Finley *et al.*, 1990; J. MacGibbon, New Zealand, 1991; Gordon *et al.*, 1992; Corkeron, 1995; Williams *et al.*, 2002) but a comprehensive *understanding* of those impacts does not yet exist.

Hearing is the primary sense of cetaceans (Higham and Lusseau, 2004). They use vocalizations not only to communicate and maintain group cohesion (Janik and Slater, 1998), but also to locate prey and navigate using echolocation (Popper, 1980). Vocalization patterns are altered by the presence of tour boats. In the case of Humpback whales in Hawaii, the presence of boats has been found to affect song phase and unit duration (Norris, 1994). The production of an 'alarm signal', as well as an increase in silence time, in belugas and narwhals has been related to the presence of boats (Finley *et al.*, 1990). An increase in whistling rate in different species of dolphins has also been linked to the maintenance of group cohesion during interactions with boats (Scarpaci *et al.*, 2000; Van Parijs and Corkeron, 2001).

So clearly, it is difficult to assess the impact of human activities on marine mammals because they live in a different environment and use their senses differently from humans (Higham and Lusseau, 2004). Strict methodologies are necessary to interpret responses to anthropogenic impacts objectively. Several short-term studies have shown a variety of responses. Most studies have focused on behavioural changes depending on the presence and density of boats. In most cases, schools of animals tend to tighten when boats are present (e.g. Blane and Jaakson, 1995; Barr, 1996; Novacek *et al.*, 2001). Some species show signs of active avoidance. Responses range from changes in movement patterns (Edds and MacFarlane, 1987; Salvado *et al.*, 1992; Campagna *et al.*, 1995; Bejder *et al.*, 1999; Novacek *et al.*, 2001),

to increases in dive intervals (Baker *et al.*, 1988; Baker and Herman, 1989; Blane, 1990; J. MacGibbon, 1991; Janik and Thompson, 1996), and increases in swimming speed (Blane and Jaakson, 1995; Williams *et al.*, 2002). These signs of avoidance can be a result of not only the presence of boats, but also the manoeuvring of boats including sudden changes in vessel speed or rapid approaches (J. MacGibbon, 1991; Gordon *et al.*, 1992; Constantine, 1999).

The presence and density of boats (Briggs, 1985; Kruse, 1991; Barr, 1996) and the distance between boats and individuals (Corkeron, 1995) can also affect the frequency or occurrence of behaviours. Humpback whales in Alaska have been seen reacting to vessels up to 4km away from their pod (Baker *et al.*, 1988). In addition, the behavioural state of cetacean groups interacting with tourist vessels can be affected and changed (Ritter, 1996; Constantine and Baker, 1997; Lusseau, 2003). For example, interactions with boats led to a decrease in resting behaviour in spinner dolphins in Hawaii (Würsig, 1996); resting behaviour seems to be the most sensitive state to boat interactions (Lusseau, 2003).

More and more studies show that the navigation of vessels interacting with animals is a key parameter in the intrusiveness of interactions (Novacek *et al.*, 2001; Lusseau, 2002; Williams *et al.*, 2002). The more boats are manoeuvred unpredictably and erratically, the more animals tend to try to elude them. The observed avoidance strategies are similar to typical anti-predator responses (Howland, 1974). For decades many species of marine mammals have associated the presence of a boat following them at close range with the harpooning, distress and death of members of the pod. It is therefore not surprising that whales and dolphins employ anti-predator techniques when a vessel targets them directly, especially when the vessel attempts to out-maneuvre or impair their movement. Of course, much of this research relates to the impacts of boat-based whale watching rather than land-based or airborne tourist activities, which have been the subject of significantly less research attention to date.

Unfortunately, most studies have examined only one aspect of complex impact problems and few studies have gathered data that can address the long-term impacts associated with tourist disturbance of wild animals. Increasingly, studies are being based on long-term observations, or are designed to capture a temporal element of analysis (Würsig, 1996; Constantine, 1999). Some studies have, for example, been able to relate changes in habitat use as well as avoidance of previously preferred areas to an increase in boat traffic (Baker *et al.*, 1988; Salden, 1988; Corkeron, 1995; Lusseau, 2002). Studies with long-term elements of analysis have now become a priority. To date, perhaps only the work of Bejder *et al.* (2006a) adequately meets this need.

Measuring and understanding biological significance

It is generally recognized that one critical but largely unresolved issue centres on the consequences of observed marine mammal avoidance responses. The

biological consequences of increased dive times, decreased blow intervals, changes in travel directions, disruption of important behaviours and increases in aggressive behaviours are not adequately understood. It is necessary to relate the effects of the responses observed to standardized parameters such as the energetic budget of the species to assess their biological significance (Higham and Lusseau, 2004).

Moreover, observing the impacts of tourism on the behavioural budget of different populations offers the opportunity to scientifically link observational data to energetic budget (Lusseau, 2003). The behavioural budget of a population is directly linked to its energetic budget (Lusseau, 2002). It is therefore possible to assess the energetic cost of avoiding interactions with boats by observing the changes in the proportion of time engaged in different behavioural states (e.g. resting, socializing and feeding). New analytical techniques are opening this avenue of research and will afford more rigorous insights into the likely biological significance of observed responses (Lusseau, 2003). For some this means that a precautionary approach should be applied to the management of cetacean-watching activities until the real extent of the problem is understood scientifically (see Shelton and McKinley, Chapter 12, this volume). Clearly, there exists an urgent need to encourage and act upon good research in the natural sciences to inform the sustainable management of tourist interactions with marine wildlife species.

Developing Insights into the Social Science of Wildlife Tourism

The complex relationship between different human activities and resource utilities also raises a number of intriguing questions which need to be addressed by social scientists. Apart from the work of Herrera and Hoagland (2006), little is known about the social and economic opportunities and opportunity costs of whaling, whale watching, tourism and tourist boycotts of destinations where whale hunting continues. In instances where potential tourists are discouraged from visiting particular destinations because of whaling activities, an important question arises as to the net economic impact of such decisions.

Higham and Lusseau (2008), in their call for empiricism to address these issues, raise a range of timely research questions. They ask: Do tourists, both actual and latent, respond to the national stance on whaling of a country where they may otherwise choose to engage in whale watching? Do they respond differently to commercial, scientific and traditional/aboriginal whaling? Does whaling undertaken by indigenous communities actually add to the cultural mosaic that makes destinations unique and attractive? Do tourists engage in whale watching in a country that hunts whales to promote the prospects of whale watching becoming an exclusive alternative to killing whales of any species? Rodger *et al.* (2007) highlight the need to better understand the interface between visitors and wildlife. They note that an understanding of the social and environmental contexts of wildlife tourism generally must make a critical contribution to the sustainability of wildlife viewing.

Responding Effectively to Good Science

The engagement of scientists from both the natural and social science disciplines is, however, only a first step. The effectiveness of good science ultimately rests with the ability for policy makers and resource managers to respond to research, and apply the insights achieved by the scientific community in meaningful and effective ways. Here again lies a barrier to sustainable tourist-wildlife interactions in marine contexts. In their study of wildlife tours in Australia, Rodger *et al.* (2007) specifically address the place of science and monitoring in wildlife tourism businesses. Their recent results demonstrate low levels of engagement of scientists in protecting the wildlife of interest to tours. They conclude that 'given the centrality of science to sustainability, mechanisms for increasing this involvement particularly in impact research, through partnerships and other means, are critical for the long-term sustainability of this industry' (Rodger *et al.*, 2007, p. 160).

The management of tourist interactions with wild dolphin populations in various parts of the world demonstrates a lack of acknowledgement of the findings of scientists, and a high degree of policy and effective management paralysis. Data collection dating back over 20 years at Shark Bay (Western Australia), where low-level commercial tourism brings groups of tourists into interactions with bottlenose dolphins (*Tursiops* sp.), was recently published in the December 2006 (Vol. 20, No. 6) issue of *Conservation Biology* (Bejder *et al.*, 2006a). This article provides rich historical insights into the development of dolphin-based tourism over time. Specifically, the unique Shark Bay data set allows detailed interrogation of the long-term impacts of vessel activity in the vicinity of bottlenose dolphins. Bejder *et al.* (2006a) present data generated over three phases: a pre-tourism phase, through the establishment of one commercial dolphin-watching operation, and two commercial operations. Through all of these phases research activity was constant. Their data collection also affords the comparative analysis of dolphin behaviour in zones where interactions with tourists take place and control (non-tourism) sites. They report that

A nonlinear logistic model demonstrated that there was no difference in dolphin abundance between periods with no tourism and periods in which one operator offered tours. As the number of tour operators increased to two, there was a significant average decline in dolphin abundance . . . approximating to a decline of one per seven individuals.

(Bejder *et al.*, 2006a, p. 1793)

Their research also identified a divergence in the tourism and control site data sets based on an analysis of patterns of dolphin avoidance and reduced female reproductive success.

The authors conclude that where 'small, closed, resident, or endangered cetacean populations' are exposed to such impacts, the consequences are likely to be serious. These findings are derived from a site of low levels of recreational and commercial tourism activity. In contrast, Higham and Hendry (see Chapter 19, this volume) report on whale watching in the San Juan Islands (USA) where it is not uncommon to witness more than 100 commercial and private boats following

a group of 25–30 cetaceans (Kind-Keppel *et al.*, 1999). Bejder *et al.* (2006a) highlight both the critical need for good science and the considerable challenge of the sustainable management of tourist–wildlife interactions. Where a large fleet of vessels seeks interactions with small, closed or endangered cetacean populations – not an uncommon scenario when tourist demand runs ahead of appropriate and comprehensive management response – the situation is particularly pressing.

So what, precisely, has been the response to the findings from Shark Bay published by Bejder *et al.* (2006a) in *Conservation Biology*? Both the Department of Conservation and Land Management (CALM) and the Marine Parks and Reserves Authority (MPRA) considered the research findings and the options to reduce the exposure of dolphins to tour vessels and provided advice to the Western Australian Minister of Environment. After careful consideration and consultation with CALM, MPRA, the existing licence holders, other dolphin researchers and stakeholders, Mark McGowan, the Minister for the Environment decided, among other things, to reduce the number of commercial dolphin-watching licences from two to one and to introduce a moratorium on any increase in research vessel activity in the affected area (Western Australian Environment Ministry Media Statement, 2006, see Box 1.1).

The Minister for the Environment clearly stated that the Shark Bay tourism industry (including dolphin provisioning at Monkey Mia) was almost entirely based on dolphin experiences and the withdrawal of one licence was a necessary sacrifice for the long-term sustainability of tourism in the area. An expression of interest

Box 1.1. Western Australian Environment Ministry Media Statement (26 June 2006) relating to sustainable tourist–dolphin interactions at Shark Bay. (From Western Australian Environment Ministry Media Statement, 2006.)

Long-term sustainability central to Monkey Mia decision (26 June 2006)

The Monkey Mia dolphin population will be given a lifeline, following a decision by Environment Minister Mark McGowan to reduce the number of commercial boat tour licences in the area. Mr McGowan announced today that he would reduce the number of licences issued to marine-based wildlife interaction tour operators in the Monkey Mia Bay from two to one, in the interests of the dolphin populations in the area. 'I will extend the two existing licences – which expire on June 30 – for another three months while an expression of interest process is undertaken to determine a new sole licensee,' he said. The Minister made the decision after carefully considering wide-ranging advice on the best manner in which to license and manage tour boat activities into the future. 'Unfortunately, the research shows that both dolphin populations – the Red Cliff Bay dolphins and the Monkey Mia beach dolphins – are being affected by the tour boat activities,' he said. 'A study by Murdoch University researcher Dr Lars Bejder has found that the Red Cliff Bay dolphins have been using the area frequented by the tour vessels less and less. The same study also found that females exposed to the vessels had lower reproductive success than the females with less exposure. The new licence will strictly limit the number and time of dolphin interactions, as well as minimising engine and propeller impacts of tour vessels. I will also introduce a moratorium on any increased research vessel activity within the Red Cliff Bay area and seek a review of the operations of private and commercial fishing vessels.'

process was subsequently undertaken to determine a sole commercial operator (Naturebase, 2006).

The Second 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, Western Australia, during 13–15 August 2006, soon after the aforementioned ministerial decision. The conference explored issues surrounding the development and long-term sustainable management of wildlife tourism and succeeded in highlighting and exploring a range of key issues that are central to the sustainability of wildlife-based tourism. Minister McGowan's statement on dolphin-based tourism at Shark Bay was both timely and topical, and provided much basis for discussion at the conference.

Two clear conclusions to emerge from the conference were that: (i) 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 conclusions were clearly articulated in a series of resolutions which were discussed at the closing session of the conference, and drafted in full (with post-conference delegate input via e-mail) following the conference. The conference resolutions included the following statement:

The conference delegates endorse and support the decision by Western Australian Minister for the Environment, Mark McGowan, to reduce the number of commercial boat tour licences in Shark Bay in response to research into the impacts of tour boat activities on dolphins.

(FACET, 2006, n.p.)

In Shark Bay, the dolphin-watching tourism industry is licensed and controlled, yet measurable impact over a relatively brief period has been documented (Bejder *et al.*, 2006a). 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 (Constantine, 1999) and Port Stephens, Australia (Allen, 2005)), one might conclude that cetacean-based tourism may 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, could go unnoticed for many years, perhaps decades. This case clearly reinforces the need for responsive and proactive management.

However, despite the concerted efforts of various stakeholders with interests in Shark Bay, challenges remain. While dolphin-viewing permits in Shark Bay have been reduced to one, nothing can legally prevent other commercial operators or private boat owners operating vessels in the area, including the control site that has previously been used by mutual agreement exclusively for research purposes. Thus, it is possible that despite the best of intentions, the recent development at Shark Bay may inadvertently result in an expanded spatial range of tourism operations and, therefore, an expanded range of tourism impacts as well as the loss of comparative data from tourism and non-tourism (control) sites.

Meanwhile, on the east coast of Australia, the New South Wales state government adopted the new National Parks and Wildlife Amendment (Marine

Mammals) Regulations 2006 to apply in that state from 2 June 2006. The main features of the amendment include:

- Minimum approach distances in line with the new Australian guidelines;
- New penalty infringement notices (AUS\$300) for any recreational and commercial vessel breaching the regulations;
- New operating rules for vessels and aircraft;
- Provision for the minister to declare approach distances for special interest marine mammals.

In a subsequent letter to all commercial operators and other tourism stakeholders, emerged the following:

In recognition of the importance of the commercial marine mammal observation tour industry to regional economies and the role of industry in educating the public about marine mammals, the Minister for the Environment has asked the Department of Environment and Conservation to investigate a *closer approach distance to whale and dolphin calves for commercial marine mammal observation tour operators* than that prescribed in the Regulation. [emphasis added]

(S.J. Allen, 2006, Sydney, personal communication)

Such a move has no doubt mystified the research community given that any such decision would fly in the face of a significant weight of scientific research that confirms the importance of approach direction, speed and distance in terms of the impacts of tourism upon focal animals (Baker *et al.*, 1988; Corkeron, 1995; Ritter, 1996; Würsig, 1996; Constantine and Baker, 1997; Lusseau, 2003), with animals engaging in resting behaviour most likely to be disturbed by approach distance (Lusseau, 2003).

In recent years, there has been a call for site- and species-specific research into the impacts of tourist interactions with various species of marine wildlife. This call is echoed in various chapters in this volume (see Seddon and Ellenberg, Chapter 9, this volume). However, the urgency of the dolphin-viewing situation perhaps argues in support of the case for careful management in respect to some clear and consistent impact issues that are now well documented in the scientific literature (Higham and Lusseau, 2004). Well-researched sites provide clear indications that dolphin-based tourism should be subject to close management (Lusseau, 2003) to limit interactions, as well as allow a degree of both spatial and temporal relief from anthropogenic interference. Meanwhile, at Port Stephens (New South Wales), where no fewer than 17 dolphin-watching boats operate, the likelihood of medium- or long-term sustainability must be brought into question.

Similarly at Kealakekua Bay (Hawaii) spinner dolphins (*Stenella longirostris*) come inshore in the middle of the day to rest, making them a likely target for observation by visitors on boats or kayaks or in the water (Driscoll-Lind and Östman-Lind, 1999). Barber's (1993) land-based observational research demonstrated shorter resting periods for animals exposed to swimmers and to boat traffic. Fortunately in this case, the State of Hawaii Department of Land and Natural Resources (DLNR) has in recent months moved to establish a temporary human exclusion area (HEA) to protect the critical resting areas of spinner

dolphins in Kealakekua Bay. It is intended that after a 1-year trial period, DLNR will implement a more permanent management protocol, which may include the continued use of an HEA.

The urgency is apparent

'Manage it or lose it' is the conclusion drawn by Bejder in the delivery of his paper at the Second Australian National Wildlife Tourism conference in August 2006 (Bejder *et al.*, 2006b). This is a conclusion that could apply to many forms of tourist engagements with marine wildlife populations, hence the title of this book. In numerous instances of tourist-wildlife interactions, it has proved that voluntary codes of practice and self-regulation do not work in the absence of limits applied to the issuing of commercial operator permits, frequency and duration of interactions and numbers of vessels and/or visitors interacting with animals. Numerous sites worldwide, many mentioned in this chapter, where boat-based interactions with cetaceans take place, such as Port Stephens (New South Wales), Shark Bay (Western Australia), Bay of Islands and Doubtful Sound (New Zealand), San Juan Islands (USA), Kealakekua Bay (Hawaii), Puget Sound (Canada), Moray Firth (Scotland) and Baja (USA/Mexico), all point towards the need for careful visitor management. Despite an expanding body of research that demonstrates the urgency of careful management, little or nothing is happening. The challenge clearly remains to turn scientific knowledge (where it exists) into management actions.

However, it is also important to recognize that tourism is often seen as a pariah and is treated as an easy target for those with concerns for sustainable resource management (see Shelton and McKinlay, Chapter 12, this volume). Concerns for the impacts of human activities upon marine wildlife do not relate exclusively to tourism, indeed some would argue that the impacts of tourism pale alongside the more immediate and in many cases terminal consequences of, for example, fisheries by-catches. In recent times it has also been interesting to note members of the scientific community responding to the impacts of their own research (and that of other researchers) on focal animals. In 2006, the collection of biopsy samples from bottlenose dolphins in Doubtful Sound (New Zealand) by a team of Auckland University marine biologists resulted in protests from fellow scientists. Increasingly, marine scientists are seeking new approaches to the mitigation of research impacts (Lusseau, 2003). Simultaneously, calls in New Zealand to ban recreational set netting in selected inner harbour and in-shore habitats to protect the endangered Hector's dolphin (*Cephalorhynchus hectori*) have largely fallen upon deaf ears.

Thus, it seems that decisions – and instances of apparent indecision – tend to be based on economics and politics which often work against, rather than for, interests in sustainability. In tourism, as in these other areas, there remain considerable barriers to effective planning, the establishment of clear management objectives, positive incentives for good research and management responsiveness to good science. The application of science to marine tourism, as well as other big system issues, remains deeply challenging to social and political

systems. Furthermore, the challenge of integrating science into complex systems to accommodate medium- to long-term future timeframes is a challenge that continues to remain outstanding.

Conclusion

It has been noted previously that the Second Australian National Wildlife Tourism Conference (Fremantle, Western Australia, 13–15 August 2006) concluded with a declaration that included a range of research and management priorities. Among them were some that bear considerable relevance to the central point of emphasis in this chapter. They included to:

- Conduct research to support identification, evaluation and monitoring of environmental impacts associated with wildlife tourism
- Review legislation relating to wildlife tourism, with a view to achieving 'uniform' national regulations and focusing more on positive outcomes
- Develop specific sustainability indicators for wildlife tourism to ensure identification and management of priority environmental impacts
- Build better coordination and cooperation in data collection mechanisms and systems
- Develop and promote broad uptake of national guidelines for managing impacts, especially of sensitive interaction types/species
- Undertake long-term research and monitoring involving sensitive species/interactions and integrate this with management
- Prioritise research on species and sites of most concern in relation to impact management

(FACET, 2006)

This book seeks to underscore the urgent need for scientific approaches to first understanding and then managing tourist interactions with marine wildlife. It draws upon the work of leading natural and social scientists whose work serves the interests of sustainable wildlife-based marine tourism.

Thus, from within the natural science disciplines of marine biology, environmental science, behavioural ecology, conservation biology and wildlife management come chapters that provide insights into the effects of human disturbance on marine wildlife, understanding impacts that tourists may have upon wild animals, and management approaches to mitigating impacts that may in the long term be biologically significant. Equally from the social science disciplines of geography, sociology, management and social anthropology are drawn chapters that explore demand for marine wildlife experiences, the benefits that visitors derive from their experiences, ethical and legislative contexts and management issues that arise when tourists interact with populations of wild animals in coastal and marine environments.

This book inevitably, perhaps preferably, poses more questions than it answers. Selected chapters provide rigorous scientific insights that should inform the management of wildlife tourism; others raise challenges and articulate important research questions that may be taken up by researchers in the natural

and social science disciplines. In both cases, the fundamental aim is to advance an understanding of the complexities of marine wildlife and tourism management, while seeking to gather further momentum behind the advancement and uptake of scholarly research serving this important field.

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