
15 Protecting the Ocean by Regulating Whale Watching: The Sound of One Hand Clapping

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Il faut aller voir. ('We must go and see')

Jacques Cousteau, motto of the Calypso

[A]ll conservation of wildness is self-defeating, for to cherish we must see and fondle,
and when enough have seen and fondled, there is no wildness left to cherish.

Aldo Leopold, *A Sand County Almanac*

Introduction

The history and current status of interactions between humans and marine mammals provide an important focus in the discussion of wildlife tourism and conservation. The relationship between whale watching, marine tourism and wildlife tourism in general has been described by Curtin (2003), as illustrated in Fig. 15.1. Whether we consume whales (Worm *et al.*, 2007) or merely watch them (Orams, 1999), the impact of humans on marine species and ecosystems can be dramatic and detrimental. Yet, in contrast to impact assessment of human activities on land, our ability to monitor degradation of the marine environment is severely constrained by the relative remoteness and apparent impenetrability of the ocean; our general lack of knowledge about range patterns and habitat needs of pelagic animals; and the tremendous cost and labor required to carry out the necessary science (Norse *et al.*, 2005).

Recreational excursions to view marine mammals have developed as among the most visible, accessible and frequent of human activities in the marine environment. Such activity takes place primarily on the ocean surface, requires no more specialized equipment than a floating platform, and is one of the world's fastest growing sectors of marine tourism (Hoyt, 2001, 2005). This chapter will consider whale and dolphin watching from the perspective of whether marine wildlife tourism and marine conservation are antagonistic or complimentary concepts, and the significance of legislation in mediating the relationship between the two.

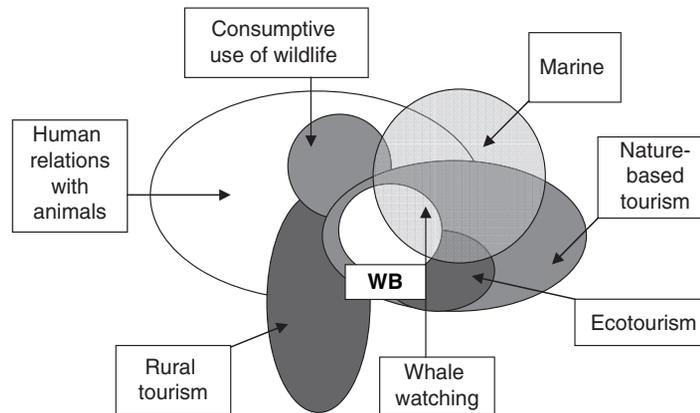


Fig. 15.1. The relationship between whale watching and other forms of human interactions with animals. (From Curtin, 2003.)

Human Interest in Cetaceans

Our fascination with whales and dolphins (and to a lesser degree pinnipeds, polar bears, manatees, dugongs and sea otters) has a history extending back at least as far as the Stone Age (e.g. Norwegian petroglyphs, drawn 6000–9000 years ago, depict whales and dolphins; Sognes, 2003). Across millennia, human interaction with cetaceans has changed from localized subsistence hunting, to whaling on a global scale, and eventually to fascination with their biological and aesthetic importance, also on a global scale (Forestell, 2002). The change in public attitude towards whales and dolphins has been most profound during the last 50 years (Lavigne *et al.*, 1999). On the face of it, this may represent a general transition from a consumptive to a non-consumptive point of view (Lavigne *et al.*, 1999), although others describe the change more as a move from direct consumption to indirect consumption (Forestell, 2002; Corkeron, 2004).

Until the end of the Second World War whales were widely viewed as a source of food and by-products that challenged industrialized nations to turn their ingenuity towards maximum extraction of the resource with maximum efficiency (Robertson, 1954). However, as the 1960s dawned, the public perception of whales and dolphins began a dramatic and relatively rapid transformation (Forestell, 2002). Television allowed millions to follow the exciting underwater escapades of Jacques Cousteau and his team of divers. Neuroscientist John Lilly argued that dolphins are highly intelligent and live complex social lives (Lilly, 1975). Popular books by conservationists and scientists like Aldo Leopold (*A Sand County Almanac*, 1949), Rachel Carson (*Silent Spring*, 1962) and Victor Scheffer (*The Year of the Whale*, 1969) raised the collective consciousness about environmental concerns. A growing number of aquariums displayed dolphins and small-toothed whales in tanks and shows for the public (Norris, 1974). Throughout North America, the UK, Europe and Australia/New Zealand

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during the 1960s there grew a perception of whales and dolphins as intelligent, entertaining and endangered. That general perception provided the backdrop for the development of two dramatic human impacts on the marine environment: the movement to save whales and dolphins from commercial hunting, and the great rush to see them in the wild.

Growth of Whale Watching

Prior to the mid-1960s, whale watching was a localized, relatively low-key activity known only in the USA. In Hawaii, a loosely organized 'whale watchers' club on the island of Oahu made occasional reports of humpback whales during the winter breeding season (Herman, 1979), but sightings were few, interest waned and the group was discontinued. In California, however, gray whales could be seen in fairly large numbers from shore during their annual migration from Alaska to Mexico, and they attracted the attention of Carl Hubbs, a professor of zoology at Scripps Institute near San Diego. Hubbs organized his graduate students to conduct an annual shore-based census of the whales starting in the 1940s (Norris, 1974), and interest in the migration began to grow. In 1950, a popular whale-watching lookout site for the public was established at the Cabrillo National Monument in San Diego (Hoyt, 2002). In January of 1953, the USA Department of the Interior's Fish and Wildlife Service issued a press release announcing the whales' 'little-known but spectacular wildlife migration' (US Department of the Interior, 1953). The government's interest in the gray whales was to monitor population size with a view to recommencing shore-based whaling under the terms of the International Whaling Commission (IWC). 'The once great American whaling industry – 100 years ago over 700 whaling ships involving an investment of \$40 million were engaged in the business – is temporarily dormant because of a lack of demand for the products. The business may be revived because the flesh of whales is similar to beef in flavour and texture, and is extensively used for food in Japan, as well as in several European countries, and has recently been introduced in the USA' (US Department of the Interior, 1953).

Two years later the first commercial whale-watching trips began operating out of San Diego (Hoyt, 2002). Within 6 years, Raymond Gilmore (the biologist hired by the Fish and Wildlife Service to oversee the issuance of whaling permits and operation of whaling stations in California) became the first onboard naturalist for whale watches operated by the San Diego Natural History Museum (Nickerson, 1977). Despite the government's focus on whale consumption, the public seemed more interested in live whales than dead ones. Gilmore developed a devoted following of avid whale watchers, and continued his popular trips for 25 years until he died of a heart attack as he boarded a whale-watching boat for one more trip at the age of 77 (New York Times, 1984).

Gray whale watching expanded to the north and south from its San Diego base throughout the 1970s, and other species began to attract attention in Canada (fin, minke and beluga whales on the Saint Lawrence River), the north-east USA (humpback whales, fin whales) and Hawaii (humpback whales;

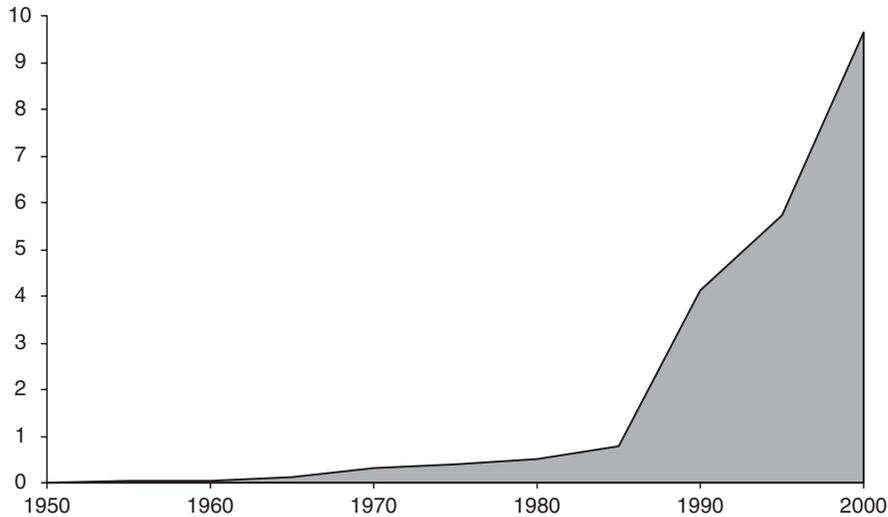


Fig. 15.2. Estimated millions of whale watchers per year, worldwide. (Modified from Hoyt, 2001.)

Forestell, 1991; Hoyt, 2001, 2002). During the following decade, commercial whale-watching operations grew rapidly throughout the world (Hoyt, 2002), and the concept of 'whale watch' grew to include both whales and dolphins. Since 2000, some 10,000,000 people have been spending nearly half a billion US dollars a year to watch whales and dolphins in more than 85 countries (Hoyt, 2001). Whale watching has been the fastest growing wildlife-based activity in the world (Lien, 2001). A general picture of the growth of whale watching between 1950 and 2000 is shown in Fig. 15.2, based on information provided by Hoyt (2001).

Environmental Impacts of Whale Watching

As whale watching has developed in hundreds of locations around the world, increasing attention has been paid to its impact on individual species (Bejder and Samuels, 2003), the local ecosystem (Olesinski, 1994), the host community (Forestell, 2005) and the global environment (IFAW, 1999). Whale watching shares with all other marine tourism activities the potential for degradation of species and their marine environment (Swartz, 1989; Miller, 1993; Orams, 1999). Corkeron (2004) notes that whale watching is unique, however, in that many conservation groups actively promote whale watching as a net benefit overall, despite short-term negative impacts to target species. He cites four justifications used by conservation groups for whale watching:

- Observing whales in their own environment will induce support for marine conservation.
- Commercial whale-watching platforms provide opportunity for scientific research.

- Whale watching will reduce the need for captive display facilities.
- Observing whales in their own environment will reduce support for commercial whale hunting.

Corkeron (2004) argues that encouragement of whale watching has a trivial impact on improving cetacean conservation. Whale watching, he believes, is an outdated manifestation of the iconic value of whales developed during the 1970s, as a reaction to rampant industrialized whaling. The 'whales as icons' perspective is now problematic he suggests, because it interferes with a rational ability to address such current questions as 'how much of the reduced productivity of the oceans and coasts should remain available to whales' (Corkeron, 2004, p. 848). Whale watching is, in his view, an outmoded front for anti-whaling advocates. He raises the question as to whether it is time to 'spread new messages' to whale watchers that 'whale populations will fare better under an internationally controlled regime of sustainable hunting rather than under culls instigated by individual nations' (Corkeron, 2004, p. 848).

Indeed, international non-profit organizations do promote a wide range of marine tourism activities that target marine mammals: World Wildlife Fund (<http://worldwildlife.org/travel/>), International Fund for Animal Welfare (<http://www.ifaw.org>), Whale and Dolphin Conservation Society (<http://www.wdcs.org/whalewatching>), American Cetacean Society (<http://www.acsonline.org/>) and Pacific Whale Foundation (<http://pacificwhale.org/>) are all international marine conservation organizations that actively promote responsible whale watching. None of them supports a return to commercial whaling. All of them recognize the rapid growth in whale watching (averaging 12% per year between 1990 and 2000; Hoyt, 2001), and the need to reduce the negative impact of tourism on the target species through the development of responsible whale watching.

The relationship between commercial whale watching and commercial whale hunting has become a more visible issue with the increasing interest by the members of the IWC in whale watching. In 1993, the IWC, an international organization charged with providing for conservation of whale stocks and the orderly development of the whaling industry, undertook initial investigations of whale watching as a sustainable use of cetacean resources. Following 3 years of preliminary collection of information, the IWC adopted a resolution in 1996 to develop guidelines for the management of whale watching to ensure ecological sustainability and satisfy, to the extent possible, the requirements of the industry and expectations of the wider community (available at: <http://www.iwcoffice.org/conservation/whalewatching.htm>). At a workshop in South Africa in 2004, a recommendation was made by representatives of the member nations to ensure that 'the best science is available for the sustainable management of whale watching' (IWC, 2004).

Established whale-watching venues consist of complex assemblages of tourism support services that develop in a relatively predictable series of phases (Forestell and Kaufman, 1994, 1996). Following some period of limited and informal public interest in the presence of one or more marine mammal species in a particular location (the Discovery phase), commercial entities either

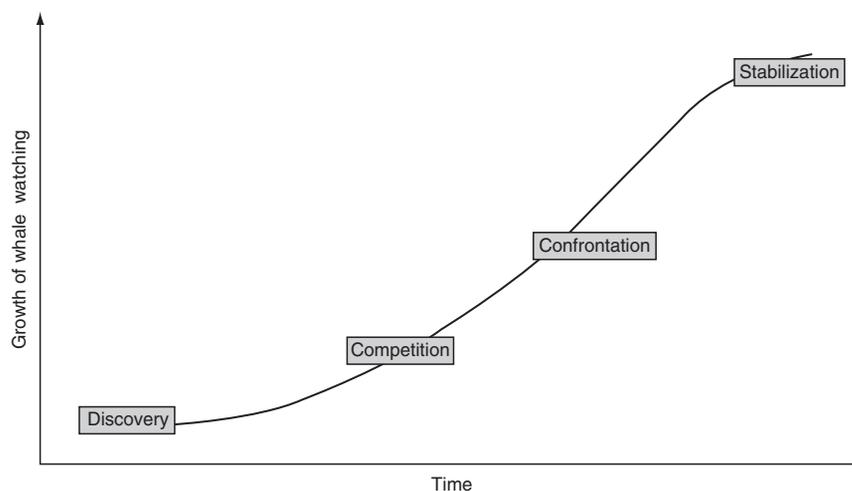


Fig. 15.3. Proposed stages in development of whale watching. (From Forestell and Kaufman, 1994, 1996.)

develop or refocus to exploit the tourists' needs for food, accommodation, transportation, equipment and guide services (the Competition phase). A by-product of the Competition phase is growth in the number of people who participate in the activity (Forestell and Kaufman, 1996). That growth frequently leads to conflicts among a range of stakeholders, including business owners, members of the local community (who may also be business owners), researchers, conservationists, resource managers and tourists (the Confrontation phase). Eventually, the conflicts are brought to some state of resolution, and a period of Stabilization ensues (Fig. 15.3). Depending upon a variety of local considerations the Stabilization phase may remain as a steady state or occasionally cycle between Stabilization and Confrontation (IFAW, 1999).

Regulation of Whale Watching

One mechanism for moving stakeholders from the Confrontation to the Stabilization phase has been the enactment of various forms of regulations developed at local, regional, state, federal and international levels. The introduction of regulations may serve as a marker that the Confrontation phase is underway (Forestell and Kaufman, 1996). Many efforts to regulate the impact of whale watching on the community, the target species, or the environment develop retroactively. The passage of the legislation post-dates the realization that there might be a problem. During the early years of legislative control of whale watching (1975–1985), uncertainty about the impacts of whale watching and the focus of legislative mandates on balancing conservation with development made decision making difficult: 'The primary objectives of guidelines and legislation regarding whale watching are to protect whales from harmful effects and

minimize disturbance of whales during this activity. Complementary objectives include the sustainable development of the whale-watching industry, educating the public and ensuring the safety of operators and the public involved' (IFAW, 2000, p. 18). In a context of competing demands and limited knowledge, legislation is likely to serve more as a retroactive tool for negotiating resolution of disparate constituent demands than a proactive mechanism for anticipating and preventing potential negative impacts (Thorne-Miller and Catena, 1991; IFAW, 2000; Garrod and Fennell, 2004; Reynolds, 2005).

Regulations are a type of intervention, and can range in degree of formality from government legislation to suggested guidelines, or voluntary codes of conduct (Garrod and Fennell, 2004). During the last five decades, a wide range of guidelines and regulations directed at whale watching have developed around the world (Carlson, 2004). At least 32 countries (including territories and dependencies) have enacted hundreds of regulatory actions specifically directed at whale (i.e. cetacean) watching. A review of the regulations, guidelines and codes in Carlson (2004) shows that current regulatory actions aim to control disturbance to specific marine mammal species from human behaviour and platform characteristics during whale-watching activities, taking into consideration a range of species-specific temporal, geographical and biological factors, while allowing for some level of tourism development.

Despite the developing proliferation of controls (voluntary or otherwise) on whale watching and other anthropogenic marine activities over the last 10 years or so, there remains a concern that such controls have either trivial (Corkeron, 2004) or insufficient (Meffe *et al.*, 1999) effects on the reduction of harmful impacts on marine mammals. Two possible reasons for the failure of whale-watching regulations to significantly enhance environmental recovery are that: (i) the regulations are not being effectively followed; or (ii) the regulations do not correctly address the impact of concern.

Managers and regulators must negotiate compromises between the needs of naturally evolving ecosystems and the needs of increasingly exploitative humans (Thorne-Miller and Catena, 1991). As Aldo Leopold (1949) pointed out, it is not ecosystems that can be managed, but the humans who exploit them. Although whale-watching regulations are for the recovery and/or protection of cetaceans, they are directed at modifying behaviours of humans. To be effective, regulations must be coincident with the psychological make-up of that group expected to comprehend the regulation and comply with it (Gardner and Stern, 1996). Unfortunately, very little work has been done to develop a systematic understanding of the relationship between regulations and the psychological or physical predispositions of whale watchers (Forestell, 1995). Garrod and Fennell (2003) undertook a comparative content analysis of 58 whale-watching codes of conduct compiled by Carlson (2001) in an effort to assess their overall consistency. The analysis was carried out on the basis of three themes (controls on approaching cetaceans, controls on interacting with cetaceans and the overall management orientation of guidelines). The authors found considerable variability among the codes, and concluded that the lack of systematic development of codes on a global basis threatened both the sustainability of whale watching and the conservation of cetaceans.

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Of particular interest in Garrod and Fennell's (2003) analysis was the finding that more than 90% of the codes they reviewed were based on a deontological perspective (correct action is mandated by authority), rather than a teleological one (correct action derives from a pursuit of best consequences). Piaget (1977), Kohlberg (1981) and others (e.g. Gardner and Stern, 1996) have emphasized the dependence of an individual's behaviour and the level of cognitive development. Their work suggests that deontological and teleological motivations to behave will influence different segments of the human population, based on factors such as life-span development, general cognitive capability and education. Garrod and Fennell's (2003) findings, however, show that the ethical orientation of the codes they reviewed was not based on careful consideration of the human population meant to follow the codes, but was a by-product of the fact that most of the codes were developed by government agencies, which are generally in the business of telling people how to behave, rather than why certain behaviours may be desirable. The result is that codes of behaviour most often result in a 'lack of ownership' (Garrod and Fennell, 2003) or a level of outright antagonism (Marion and Reid, 2007) that limits compliance.

Development of 'values-based' regulation by government agencies is restricted by the fact that enforcement must generally be based on the observable behaviours of the human rather than the internal states of either the human or the whale, or the potential long-term effects of a given behaviour (Forestell, 1995). Deontological, action-based codes are more likely to be proposed by regulatory agencies responsible for ensuring compliance. Unfortunately, this can create further problems if deontological regulations are implemented which are out of step with the competencies of the group that is expected to comply with them. Recreational boaters not experienced at differentiating between species will have difficulty following species-specific regulations. Distance limitations on approaching pods with calves are of little utility for those who cannot determine whether a calf is present until after the limitation is exceeded. The most frequently invoked regulation in the codes reviewed by Garrod and Fennell (2003) concerned approach distance (found in 88% of the codes). A restriction on approach distance was first employed in 1976 in a public notification as to how National Marine Fisheries Service would define 'harassment' in its efforts to protect humpback whales from human activity in Hawaii. Since then, the control of approach distance has become an integral part of regulations throughout the world. The prevalence of distance limitations is somewhat surprising, given that humans are relatively poor at estimating the distance between a boat they are on and pods of whales they are observing (Baird and Burkhart, 2000).

Formally established codes of conduct (whether legislated or voluntarily accepted) frequently suffer from inflexibility and intractability. The ability to track changes following implementation of regulations and the ability to modify regulations on the basis of change in a timely and effective manner are critical components of successful management and stakeholder acceptance (Hilborn, 2005). In 1991, the state of Hawaii passed a law banning commercial Jet Ski and parasail operations in certain near-shore waters of Maui during the winter

time while humpback whales were present. It was argued that these operations might be responsible for displacing mothers and calves from preferred near-shore areas. No systematic surveys had ever been undertaken to establish that mothers and calves had, in fact, been displaced from shore (although some anecdotal observations supported that conclusion, e.g. Glockner-Ferrari and Ferrari, 1990); nor were data available regarding the effect of Jet Ski and parasail operations on whales in Maui waters, relative to other activities such as whale watching, near-shore development, military activity on a near-by island and so on. None the less, it was generally felt that, given the endangered status of humpback whales and the proliferation of human activities in the near-shore waters of Maui, it was best to 'err on the side of caution', and ban the activities in question.

Following the implementation of the ban, no studies were carried out to determine whether any observable change in the distribution or behaviour of humpback whale mothers and calves resulted. Consequently, little or nothing was learned that might be of value to managers in other areas with respect to how to deal with potential problems associated with similar activities. No evidence has been established to verify either that such activities have a measurable impact, or that any effects of such activities have been mitigated following imposition of regulatory control. Any manager operating elsewhere must fight the same battle from scratch, unaided by any precedents that might have emerged from the Hawaii experience. In 2004, a US District court ruled the ban unconstitutional (Kubota, 2004), and although further legislative efforts have been taken to reinstate the ban, the matter continues to be debated without the benefit of scientific evidence.

A further limitation on the ability of whale-watching regulations to improve the conservation status of cetaceans is lack of enforcement (Beaubrun, 2002). As the economic significance of the whale-watching industry grows, the lobbying capabilities and overall political influence of operators become a major force in the determination of how, or whether, regulations are enforced. Especially during the Competition phase (Forestell and Kaufman, 1996) the stakes increase, and so may the degree of self-interest and perceived need to protect the status quo. Establishing a pattern of equitable and effective enforcement as quickly as possible may decrease the likelihood that regulations will become neutered or abandoned in the interests of economic success. Rules should be enforced. While this may appear obvious, it is frequently the case that regulations are developed even when there may be little hope of enforcing them. Often this is because the resources are not available to permit monitoring, enforcement or prosecution. In some cases the activity may take place in relatively inaccessible areas, in other cases the cost of enforcement is prohibitive.

The author's personal experience at various levels in the development and growth of whale watching in Hawaii, Japan, Australia, Costa Rica and Ecuador over the last 25 years has provided a number of disparate views of enforcement. Perhaps the most well-funded and stringent enforcement occurs in the USA (viz. Hunter, 2007). Enforcement is also well funded in Australia, but in many cases, the view that operators know best prevails (May, 1994), and the development and oversight of regulation is heavily influenced by the industry.

In Japan, an age-old network of local fishermen's cooperatives is used to manage inshore resources equitably among the members (Acheson, 2005), and the system has been adapted to allow operators to manage whale watching in some areas (IFAW, 1997). In Costa Rica, enforcement is not funded at the local level, although federal regulations prohibit swimming with cetaceans (L. May-Collado, San Jose, Costa Rica, personal communication). Ecuador does not yet have regulations controlling whale watching. While there is some degree of control over commercial operations, it is aimed primarily at passenger safety (C. Castro, Puerto Lopez, Ecuador, personal communication). Fewer than half the countries reported by Hoyt (2001) to promote whale watching are included in the list of those that have regulations in place to control the activity (Carlson, 2004), and even where regulations are in place there is ample evidence that regulation without enforcement is an exercise in futility. [AU3]

What Does Regulation of Whale Watching Accomplish?

Regulation of whale watching has been driven by concerns that particular species may be irreversibly damaged by the presence and behaviour of humans on boats or in the water (IFAW, 1995). An increasing number of studies have shown that short-term behaviour (e.g. vocalization patterns, respiration rate, diving pattern, direction and speed of movement, activity state) of many cetacean species is significantly altered by the presence and activity of whale-watching boats and/or humans entering the water to engage in a variety of 'swim-with' programmes (Constantine, 1999; Bejder and Samuels, 2003; Samuels *et al.*, 2003). The short-term damage cetaceans can experience from interactions with 'curious' humans has been demonstrated many times in all parts of the world. The last intentional killing of a right whale in the USA occurred off the coast of Florida in 1935, when a group of recreational deep-sea fishermen repeatedly shot and harpooned a mother and calf over a 6 h period, until the calf finally died (Kraus and Rolland, 2007a). The calf was then tied to the boat and dragged back to shore for public display. Doak (1988) reviews a number of incidents, extending over a 30-year period, in which lone 'sociable' dolphins were injured or killed following interactions with humans. In Brazil, a lone bottlenose dolphin approached and swam with humans over a 15-month period beginning in March 1994 (Santos, 1997). Swimmers repeatedly attempted to touch, grab and climb onto the dolphin's back. Attempts were made to stick objects in the dolphin's blow-hole. The dolphin injured a number of swimmers in response to harassment, finally killing a 30-year-old man with its tail flukes. In Australia, unruly behaviour of tourists attempting to feed wild dolphins at two locations (Shark Bay in Western Australia and Tin Can Bay in Queensland) has resulted in government regulations to control (but not prevent) such activity (Constantine, 1999; Mann and Kemp, 2003; Samuels *et al.*, 2003).

The evidence is overwhelming (both quantitatively and qualitatively) that unregulated interactions between humans and dolphins are almost always more dangerous for the dolphin (Doak, 1988). For that reason it is not only

appropriate, but critical, that limits on feeding and touching wild cetaceans be imposed to prevent the most egregious forms of human behaviour. Samuels *et al.* (2003) provide evidence that such limits can have positive outcomes. However, even with regulations (whether legislated or voluntary) in place there remains a need to engage in proactive efforts to inform the public about appropriate behaviour, and maintain ongoing monitoring and enforcement (Orams, 1995b; Santos, 1997).

Although it seems clear that regulating human behaviour in the vicinity of whales and dolphins can reduce direct, short-term impacts, the greater concern that has emerged in the past decade is the need to address the long-term effect of anthropogenic impacts (IFAW, 1995). As noted by Meyers and Ottensmeyer (2005, p. 59): '[I]t is the process of extinction that is important, not the recording of the last individual.' Whale researchers are rising to the challenge of those who call for rigorous, quantitative and systematic evidence of long-term effects of whale watching. A comprehensive review by Bejder and Samuels (2003) provides a much-needed framework for not only conducting future studies, but also putting current and past efforts into a more unified context. The use of methodologies and analyses such as those described by Bejder and Samuels (2003) and Lusseau (2003) has led to a more rigorous and nuanced understanding of the effects of tourism on marine mammal behaviour. Lemon *et al.* (2006) have shown that the presence of boats can change the behaviour and movement direction of resident bottlenose dolphins without changing the rate of whistling or duration of echolocation bouts. The effect of boats was found even beyond the 30 m distance limit imposed on boats by federal regulations in place in that area (Lemon *et al.*, 2006). Bejder *et al.* (2006) found that some, but not all, bottlenose dolphins left an area when boat approaches were newly introduced, although no change in residence was documented in an area where boat approaches had been in place for some time. The finding is important because it bears directly on claims that dolphins (or other marine mammals) habituate to the presence of boats over time (Watkins, 1986). In reality, it may simply be the case that the more disturbed animals leave an area permanently, and only those who may not be able to change their habitat-use patterns remain (Bejder *et al.*, 2006). The result is a kind of 'double whammy' on resident populations, since sensitized animals are driven into less preferred habitat, while the remaining animals are left to bear the brunt of boat disturbance. These studies have significant importance for their ability to inform a rational, science-based development and use of regulations to control the impact of whale watching on cetacean populations.

Whale watching has been identified as a potential threat to local populations of marine mammals (Constantine, 1999; Marsh *et al.*, 2003; Samuels *et al.*, 2003), particularly in the case of endangered species. Physical damage or behavioural disturbance by boats (Marsh *et al.*, 2003) and harassment by human swimmers (Samuels *et al.*, 2003) are of particular concern. The stark reality, however, is that even if we were to win the battle of protecting specific marine mammal groups in particular areas from the impacts of marine tourism by successfully controlling the behaviour of whale watchers through legislative initiatives, it is unlikely that we would have done much to win the war of

protecting endangered marine mammal species or the ocean in which they live. Simply put: 'In the big picture of conservation concerns for cetaceans . . . the effects of whale watching are pretty trivial' (Corkeron, 2004, p. 848). Even when considering one of the most endangered cetacean species in the world, the North Atlantic right whale, Kraus and Rolland (2007a) write: 'Although whale watching could potentially have some effect on the whales by distracting or stressing them, it is difficult to imagine this is a significant problem compared to the fatal threats posed by large ships and fixed fishing gear' (p. 25). Recent compendia of detailed scientific analyses of issues considered most detrimental to marine biodiversity in general (Norse and Crowder, 2005a) and marine mammals in particular (Twiss and Reeves, 1999; Gales *et al.*, 2003; Reynolds *et al.*, 2005; Estes *et al.*, 2006; Kraus and Rolland, 2007b) are, with one exception (Gales *et al.*, 2003), devoid of any mention that whale watching presents a substantial threat to the overall protection of marine mammals or the global marine environment. Commercial hunting, fisheries by-catch and entanglement, ship strikes, toxic run-off from land, marine debris, noise pollution, habitat degradation and global warming all present far greater threats to cetaceans than whale watching (see Twiss and Reeves, 1999; Reynolds *et al.*, 2005 for detailed treatment of these effects). Kraus and Rolland (2007c) argue that many species of cetaceans, including right whales, killer whales, beluga whales and Indo-Pacific humpbacked dolphins suffer from what they term 'urban whale syndrome' – increased mortality, decreased reproduction, compromised health and habitat loss as a result of exposure to anthropogenic factors. While whale watching might add to the problems, it is not considered a major contributor to the syndrome.

As whale watching continues to grow and thrive worldwide, global perspectives are becoming more and more important in shaping conservation agendas. The conversation has shifted from protection of species to protection of ecosystems (Meffe *et al.*, 1999). There is a continuing debate about the relative importance of observing individual organisms acting locally in the short term (Greene, 2005; Parrish, 2005) versus clusters of species interacting in complex benthic webs across vast temporal and spatial scales (Paine, 2006). Despite the challenges to understanding how large-scale marine ecosystems have been impacted by current and historical anthropogenic impact patterns (Jackson, 2007), the emerging view of appropriate strategies for conservation of marine species is tipping towards 'whole of ocean' strategies (Soulé, 2005). The focus of legislation and management (and the science to support them) based on a 'whole ocean' approach is to maintain or restore the natural structure and function of ecosystems, including their biodiversity and productivity (Currie, 2006). Ecosystem Based Management (EBM) faces the challenge of protecting resources across a wide range of political and cultural agendas protected by the 1982 Convention of the Law of the Sea out to the limits of each coastal country's Exclusive Economic Zone (generally 200 nautical miles from shore), and the 'frontier exploitation' (Norse, 2005) that has characterized human behaviour on the open ocean.

Perhaps one of the most widely recognized tools available to assist in the promotion of EBM is the use of 'place-based management' strategies (Norse

et al., 2005). The first images taken of Earth from space brought realization to many that we live on the 'Ocean Planet' (Benchley, 1994). Those images may have also reinforced the notion of a vast, featureless realm, like the big blue spaces found on maps of the world. The real ocean, of course, is a complex web of horizontal and vertical patterns of movement of great portions of seawater driven by wind, tide and temperature, but shaped by interactions with diverse geological and biological formations on the ocean floor, stretching from coastal reef structures all the way out to deep ocean sea mounts and trenches (Thorne-Miller and Catena, 1991). The biological diversity of the ocean is, in turn, largely determined and distributed by the presence of 'hot spots' generated by a range of these heterogeneous sub-surface features that are largely hidden from view (Norse *et al.*, 2005). Marine place-based management aims to identify and conserve the resources associated with specific 'hot spots'. In doing so, such an approach may be viewed as consistent with the perceived need to protect habitats and ecosystems of biological significance (Ragen, 2005).

Place-based management efforts have led to a wide range of decisions regarding the location and size of places to be managed, and the activities to be regulated within them. Ideally, management schemes should recognize the interconnectedness and interdependence of physical and biological systems throughout the marine environment. Simply put, 'There is only one world ocean system and all the water circulates throughout it' (Hoyt, 2005, p. 69). In reality, however, only one half of 1% of the entire ocean outside the limits of the Exclusive Economic Zones is subject to some form of fisheries-related protective regulation (Roberts, 2005). Hoyt (2005) has provided a very detailed and informative summary of more than 500 marine protected areas (MPAs) proposed or in place, in all oceans of the world, that are in whole, or in part, aimed at providing some form of protection to marine mammals. Hoyt (2005) also reviews a number of legally and functionally different definitions, listing 68 different designations that may broadly be considered MPAs. In fact, many of these designations provide little substantive protection because they are too small in size, too limited in biological focus or inadequately managed (Roberts, 2005). Hoyt recognizes these challenges, but argues that MPAs for cetaceans are an important beginning, and provide a necessary framework for future improvements in marine conservation. He also emphasizes repeatedly that aggressive pursuit of well-defined and managed MPAs for cetaceans is critical because 'around the world, cetacean habitat, inside and outside protected areas and international sanctuaries, is little recognized, largely undescribed, marginally protected at best and being degraded every day' (Hoyt, 2005, p. 11). Marsh *et al.* (2003) argue that with the appropriate focus on protecting the full range of habitat requirements, incorporation of core areas and 'no-take' zones to protect prey abundance, and embedded within broader networks of protected areas to ensure ecological sustainability, MPAs can serve as critical mechanisms for recovery and protection of marine mammal species. Regional MPAs aimed at controlling direct impacts of wildlife tourism on local groups of animals do not come close to meeting that description (Hoyt, 2005).

The Sound of Two Hands Clapping

Regulation of whale watching as a means of affording global protection to marine mammals and their habitat is akin to putting a band-aid on a gaping, haemorrhaging wound. Regulation might reduce local disturbance to some resident populations targeted by tourism operators, or it might prevent added stress to populations suffering debilitation from other impacts. It will not prevent or reverse the range of more serious human-induced impacts that continue to threaten a number of marine mammal species that, for the most part, are not even targeted by marine tourism. These include the North Atlantic right whale, Florida manatee, Hawaiian and Mediterranean monk seals, Stellar sea lions, southern sea lion, spotted and spinner dolphins in the Eastern Tropical Pacific, beluga whales, killer whales, Asian river dolphins, Western North Pacific gray whales, vaquita, Indo-Pacific humpbacked dolphin, striped dolphin, baiji, bottlenose, Okinawan dugong, sea otter and polar bear to name a few (Perrin, 1999; Ragen *et al.*, 2005). In the grand scheme of marine mammal protection and conservation of marine biodiversity, whale watching is not the problem.

Sadly, however, there is little evidence to date that whale watching is part of the solution.

It need not be that way. With 10 million people a year participating in commercial whale-watching operations (Hoyt, 2001) there is a continuing opportunity to 'turn tourists into Greenies' (Orams, 1997; Johnson, 2002). Forestell (1991, 1993) first made the case that commercial whale-watching trips were an important, generally untapped, venue for promoting environmental awareness, enhancing appreciation for endangered species, and motivating participants to undertake behaviours that would reduce land-based activity that could threaten the oceans. Orams (1995a,b; 1997) further developed the use of interpretation as a mechanism for changing attitudes and behaviours of participants in a dolphin-feeding programme at Tangalooma Resort on Australia's east coast. He showed promising evidence that as a result of educational intervention behaviour change could occur (Orams, 1995b). Despite encouraging signs that interpretation programmes would become an integral part of commercial whale-watching operations around the world (IFAW, 1997), there has been little evidence that such programmes have ever been widely developed. Although onboard interpretation is mandated as conditions of obtaining commercial whale-watching permits in Australia and New Zealand, there is little effort made to ensure the quality of such programmes (IFAW, 1997). Where programmes are in place, their focus is often limited to the local species and environment, and is not based on a structured approach, and fails to connect the whale watcher with global environmental concerns (Curtin, 2003; Lück, 2003). Exceptions have been Orams' (1997) work with tourists at Tangalooma, and programmes offered by Pacific Whale Foundation in Hawaii (Forestell, 2005). In both cases, careful consideration has been given to the structured content of the programmes, the training of the interpretation staff and the need to connect the participant to broader environmental concerns.

The historical focus on whale watching as a place-based, species-specific, locally controlled activity has resulted in a disconnected network of hundreds of

whale-watching operations around the world (Hoyt, 2001) characterized by a wide range of inconsistently developed and enforced codes of conduct (Carlson, 2004) carried out in a vast patchwork quilt of MPAs (Hoyt, 2005). In many cases, the designation of protected areas is little more than a 'national or international statement of good intention' (Hoyt, 2005, p. 23). While there are clearly needs for at least some of the management regimes that have emerged from such a focus (Marsh *et al.*, 2003), one cannot help but notice that in spite of the efforts to keep whale watchers from directly harming whales (and other marine mammals) while watching them, the rate continues to escalate at which the oceans are being emptied of marine life and filled with noise, debris and poison (Norse and Crowder, 2005b). The 10 million people going whale watching every year are part of the reason why that is happening, but with few exceptions, nobody is effectively delivering that message.

It is frequently noted by scientists, resource managers and educators that any effort to reduce the harmful impacts of human use of the ocean and conserve marine biodiversity must incorporate an understanding of human behaviour and include well thought out educational programmes (IFAW, 1999; Meffe *et al.*, 1999; Marsh *et al.*, 2003; Hoyt, 2005). There is excellent evidence that wildlife tourists want to be educated about global issues (Lück, 2003, Fig. 15.4) and that well-designed education programmes can affect their behaviour (Orams, 1997, Marion and Reid, 2007). Despite the best intentions, however, high-quality education programmes are either absent or are overshadowed by 'animal protectionists (who) mobilize concerned, yet uninformed citizens to



Fig. 15.4. There is excellent evidence that whale watchers want to be educated about marine conservation issues. (From Lück, 2003; Photo courtesy Pacific Whale Foundation.)

clamour for an end to any animal use' (Marsh *et al.*, 2003, p. 5). As Corkeron (2004) has suggested, we need to 'refashion' the iconic value of whales and use them to 'help spread new messages about marine conservation' (p. 848).

There are a number of land-based models of effective interpretation and education programmes that can inform similar efforts in marine settings (Marion and Reid, 2007). However, whale-watching tours are often relatively brief (2–3 h), and are frequently conducted aboard small boats with little stability, noisy engines and limited space and freedom to move about. These factors provide unique challenges to effective delivery and follow-up (Orams, 1999), particularly if half the audience is fighting nausea and/or fear that the boat may sink or be hit by a whale (Forestell, 1992). One of the things that we have learned about whale watchers is that they tend to travel widely and engage in whale watching in a number of venues (Forestell and Kaufman, 1994). Rather than worry about designing 'one-size-fits-all' education programmes, it may well be better to focus more on matching message to platform, with the long-term view of 'modularizing' the information concerning global issues and marine environmental concerns. Another way to extend the opportunity to educate whale watchers is to redefine the whale-watching experience to include time spent planning and preparing for the experience and time spent returning home following the experience (IFAW, 1999). Nature shows on television, airline flights, passage aboard cruise ships, interactions with travel agencies, rental car agencies, booking agencies, accommodations, dining and auto service, all provide novel and potentially important venues to amplify and reinforce an understanding of anthropogenic threats to the marine environment and steps that can be taken to mitigate them.

Not only is it important to broaden and re-imagine the venues available for education and interpretation as part of the whale-watching experience, it is also important that the venues involved model desired behaviours and provide participants the opportunity to engage in well-defined and specific activities that help mitigate environmental concerns. For example, Pacific Whale Foundation in Hawaii, which takes nearly 200,000 people a year on a variety of marine tourism activities (G. Kaufman, Maui, Hawaii, personal communication), has introduced a number of environmentally sound practices. They use purpose-built boats with special noise abatement features to reduce noise, increase fuel efficiency and minimize disturbance to marine mammals; burn bio-fuels; develop pump-out facilities to avoid ocean discharge; use recycled food receptacles; they choose menu items that promote sustainable practices and their staff are trained naturalists with the ability to educate passengers about the local ecology and its linkage with global concerns (Forestell, 2005). There is encouraging news that many sectors of the travel industry are introducing new initiatives to not only reduce their own carbon emissions, but also to provide customers the opportunity to calculate and offset the 'carbon footprint' generated by their own travel (Boehmer, 2006).

[AU3]

One major issue that has yet to be effectively recognized and incorporated within whale-watching interpretation/education programmes is the need to better understand the attitudes, motivations and cultural values of the target audience (Ham and Krumpke, 1996). All too often, tourists are viewed as the

uninformed 'dupes' of animal rights advocates who need to be told the facts by more knowledgeable scientists (Marsh *et al.*, 2003; Corkeron, 2004). This perspective drives a continuing tension between science-dominated environmental research and socio-cultural methodologies aimed at changing behaviour through teleological rather than deontological approaches (Head *et al.*, 2005). Much more work remains to be done to build effective interpretation/education programmes that derive their techniques from a rigorous understanding of the 'zeitgeist' of the whale watcher (Higham, 1998).

Summary and Conclusion

Interest in watching whales, dolphins and other marine mammals has grown exponentially over the last five decades, and shows little evidence of abating. The global reach of marine wildlife tourism ventures focusing on marine mammals raises valid concerns about the potential impact on endangered species and the sustainability of ever-expanding commercial operations. In response, a number of local, national and international efforts have been undertaken to protect marine mammals from short-term and cumulative impacts of whale watching. The long-term effects have yet to be established, but there is growing encouragement for the use of the 'precautionary principle' in developing strategies for protection (IFAW, 1995). Whale watching takes place in more than 80 countries around the world (Hoyt, 2001). Less than half of those have formal regulations or voluntary guidelines controlling the actions of whale-watching platforms or swimmers in the vicinity of marine mammals (Carlson, 2004). More than 500 MPAs have been, or are, proposed to be put in place around the world (Hoyt, 2005). There is good evidence that some of the more obvious and flagrant forms of local, short-term disturbance to marine mammals may be prevented or mitigated by the regulation of whale watching. There are two general problems associated with depending primarily on regulation for the conservation of marine mammals and their ocean environment. First, the marine mammals most threatened by anthropogenic factors are faced with problems generally believed to be far more serious than whale watching. Second, even if we are successful in preventing all disturbance to marine mammals associated with whale watching, we will have contributed little or nothing to the overall protection of marine biodiversity.

Although whale watching does need to be regulated to some degree to ensure it does not add to the greater damage of other anthropogenic effects, such regulation is of little long-term utility on its own. Coupled with appropriate and well thought out education programmes, however, it may be possible to make greater headway in addressing the need to change a range of human behaviours associated with damaging the ocean. Appropriate educational efforts need to go beyond the local context of the particular whale-watching location, species and concerns and extend to the 'big picture' challenges of overpopulation, overfishing, pollution from debris, toxins and noise, habitat destruction and global warming. A two-handed approach of regulation coupled with education could help to significantly increase the number of people who demonstrate their

understanding of the degree to which degradation of the ocean threatens us by changing behaviours that contribute to the problem. Success in such a venture needs a broadened framework that will include not just the stakeholders in the target whale-watching experience, but in all those people and agencies involved in getting whale watchers to and from their destinations.

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Author Queries:

[AU1] Lilly, 1967 has been changed to 1975 to match Reference list.

[AU2] Garrod and Fennell, 2003 not in Reference list.

[AU3] Please provide year for “personal communications”.

[AU4] Please provide volume number for “Glockner-Ferrari & Ferrari, 1990”.