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## Whale Watching

ERICH HOYT

Whale watching is the human activity of encountering cetaceans in their natural habitat. It can be for scientific, educational, and/or recreational purposes (sometimes all three). Mostly, whale watching refers to a commercial enterprise, although it is sometimes undertaken privately. The wide variety of whale watching activities includes tours lasting from 1h to 2 weeks, using platforms ranging from kayaks to cruise ships, from land points including cliffs and beaches, from sea planes and helicopters in the air, as well as swimming and diving activities in which the whale watcher enters the water with cetaceans. Whale watching grew out of the traditions of bird watching and, to a lesser extent, other forms of land-based wildlife watching. To this day, the better whale and dolphin trips include sea birds, seals, turtles, and other marine fauna to appeal to more people as well as to give a well-rounded ecological interpretation.

### I. The Birth of Whale Watching

The species originally responsible for the development of whale watching was the gray whale (*Eschrichtius robustus*). Beginning in

the mid-1940s, students from Scripps Institution of Oceanography, led by Carl L. Hubbs, began participating in annual gray whale counts from university buildings such as Ritter Hall and from coastal headlands and lighthouses. In 1950, the Cabrillo National Monument in San Diego was converted into a public land-based whale watch lookout, attracting 10,000 people the first winter. Year after year, more and more people came to watch whales.

In 1955, the first commercial whale watch operation charged \$1 US to see gray whales on their winter migration off San Diego. Although the gray whales passed close to shore, the boat tours sometimes allowed a closer look. By 1959, Raymond M. Gilmore, a US Fish and Wildlife Service biologist who had taken over the gray whale counting chores from Carl Hubbs, began serving as the first naturalist on whale watch trips out of San Diego. Through the 1960s and early 1970s, boat tours and land-based whale watching spread slowly up the coast of California to Oregon and Washington, and the first long-range commercial whale watch trip to the Mexican calving lagoons was organized out of San Diego.

In 1971, the Montreal Zoological Society began offering whale watch tours to go down the St. Lawrence River in Canada to see mainly fin (*Balaenoptera physalus*) and minke whales (*Balaenoptera acutorostrata*), and belugas (*Delphinapterus leucas*). This was the first commercial trip on the east coast of North America. These trips became an annual event.

It was the humpback whale (*Megaptera novaeangliae*), however, that turned commercial whale watching into a big industry. Humpback whales tend to be more active at the surface than gray or other whales, frequently breaching clear of the water—ideal for whale watchers wanting photographs. Added to this is the phenomenon of “friendly” behavior—the tendency of certain individual humpback whales to habituate to the presence of whale watch boats and to approach them regularly. This behavior, first observed commonly in humpback whales, has now also been found in gray whales, particularly in the mating and calving lagoons of Baja California, Mexico; in certain minke whales; and in killer whales, or orcas (*Orcinus orca*), and bottlenose dolphins (*Tursiops truncatus*), among others.

In New England and Hawaii, tours to see humpbacks began in 1975. For more than a decade before, the Wailupe Whale Watchers, a local club on Oahu, sponsored loosely organized, infrequent tours, but when whale watching began in earnest from Lahaina on Maui, where the humpbacks were more numerous and accessible, it immediately became the center of the humpback whale watch industry in the Pacific. Most of the Hawaiian tours were strictly commercial.

In New England, however, operators established their own brand of commercial whale watching with strong scientific and educational components—naturalists on every trip who were often working researchers. Educational programs to introduce school children to wild cetaceans—began in southern California by such groups as the American Cetacean Society—were expanded in New England. Within a decade, the New England industry would attract even more participants than Californian and Hawaiian whale watching. New England was fortunate to have humpback whales on the feeding grounds centered on Stellwagen Bank, 10 km north of the tip of Cape Cod, as well as North Atlantic right (*Eubalaena glacialis*), fin, minke, and sometimes long-finned pilot whales (*Globicephala melas*), and Atlantic white-sided dolphins (*Lagenorhynchus acutus*). From a commercial point of view, Stellwagen Bank was ideally located close to the large population centers of the US east coast.

## II. Scientific Whale Watching

Whale watching for the purposes of research can be traced back to Aristotle, who spent time on boats and with fishermen in the Aegean Sea. In “Historia Animalium,” Aristotle noted that the fishermen would nick the tails of the dolphins and that they could tell them apart. This practice foreshadows the studying of animals by watching them, a key feature of the ethology approach for studying birds and land animals pioneered by Konrad Lorenz, Niko Tinbergen, and others (Hoyt, 1984). It took longer to attempt such research with cetaceans because of the greater difficulties of approaching close and conducting research at sea. The photographic identification (photo-ID) research of cetaceans began in the early 1970s with humpback whales in the North Pacific and North Atlantic, gray whales and killer whales in the eastern North Pacific, and southern right whales (*E. australis*) and bottlenose dolphins off Argentina.

A successful partnership between science and commercial whale watching began in Provincetown, Massachusetts, in 1975, when Al Avellar of the *Dolphin* fleet asked Charles “Stormy” Mayo to be his naturalist. Mayo soon saw the possibilities for using the boat as a platform for studying whales. He set up the Center for Coastal Studies as a research and educational institution, and the close ties with commercial whale watching have been maintained ever since.

The arrangement works as follows: The Center provides naturalist guides for the *Dolphin* fleet. They are paid to help direct the boat to the whales, presenting an informal educational lecture, and answering questions. The Center sells T-shirts and other merchandise on board. Most important, Center researchers can conduct their own photo-ID research, and often collect other data. Sometimes more than one researcher will come aboard to ensure the maximum use of boat time.

This key partnership between science and commerce has determined the course of whale watching, as well as the practice of whale research, throughout southern New England. As of 1995, 18 of the 21 whale watching operators that mainly go to the Stellwagen Bank area had naturalists guiding boats and lecturing whale watchers, while 10 operations were taking and contributing ID photos. Despite the competitive atmosphere of commercial whale watching in New England, the researchers and their representative institutions have cooperated in setting up the North Atlantic Humpback Whale Catalog—a photo catalog and data-base covering more than 10,000 individual whales. As a measure of the scientific value of whale watching, at least 30 published papers in refereed journals have come largely from research aboard whale watching boats on Stellwagen Bank (Hoyt, 1995).

The New England model of successful whale watching and research, like Yankee whaling from an earlier century, has had an impact on the development of whale watching in locales as diverse as the Gulf of St. Lawrence in Quebec, northern Norway, and Dominica in the eastern Caribbean. Of course, a large part of scientific research on cetaceans does not lend itself to being conducted from commercial whale watch trips (such as transect surveys, biopsy darting, and collecting skin and fecal samples). In some cases the research and commercial enterprise operate separately, using different boats and personnel, but the commercial operation supports or contributes to the research. In several areas, whale watch operations have discovered new populations of cetaceans, accessible for study. In all, whale watching worldwide has led to at least 50 cetacean photo-ID programs supported in part or conducted aboard commercial whale watch boats. This has contributed to considerable public support for research through greater familiarity with research programs.

### III. The Growth of Commercial Whale Watching

The value of whale watching in 1981 was estimated to be \$4.1 million US in direct revenue and \$14 million in total revenues (including travel, accommodation, food, and souvenirs), based on approximately 400,000 boat-based whale watchers. By 1988, these numbers had expanded by more than 3 times, with the industry still based largely in New England and California as well as a small amount in Canada, Mexico, and the US Northwest (Table I).

In the late 1980s, whale watching began to spread rapidly to other parts of the world. Between 1987 and 1991, new whale watch industries started up in the Canary Islands, the Azores, Belize, Costa Rica, Dominica, Italy, Madagascar, and New Zealand, whereas existing industries expanded rapidly in Argentina, Australia, South Africa, and in parts of Canada. The diverse opportunities for whale watching included boat tours to view rare species (Heaviside's dolphins, *Cephalorhynchus heavisidii*, in South Africa), observing sperm whales, *Physeter macrocephalus*, from the air (New Zealand), land-based whale watching of southern right whales (South Africa, Australia, Brazil), and glimpsing various beaked whales in the Azores and the Bahamas. However, by the 1990s whale watching meant for the most part going to sea on large, comfortable, purpose-built ships that could take 150 to 400 people to see the whales and return to the dock in 2–4h.

During this same period, whale watching became important in Norway and Japan, two countries with strong whaling interests. In both countries, the number of whale watchers increased steadily year by year until, in 1998, Norway had more than 21,000 whale watchers spending \$6.9 million US, whereas more than 102,000 whale watchers in 20 Japanese communities spent \$32.4 million US (Hoyt, 2001). Norway's whale watching industry has about a dozen operators working from four communities and offering sperm and other whales (May–September) or killer whales (October–December); whale watchers (visitors) primarily come from other European countries. Japan's whale watching industry, however, is a 99% domestic industry with diverse attractions including Bryde's whales (*Balaenoptera edeni*) and sperm whales at several warm-water locations from Shikoku Island and adjacent Honshu; humpback whales and tropical dolphins in Okinawa and Ogasawara, both island groups off southern Japan; and minke whales, Dall's porpoises (*Phocoenoides dalli*), and Pacific white-sided dolphins (*Lagenorhynchus obliquidens*) from Hokkaido in the north, as well as multiple locations for watching bottlenose and other dolphins off southern and eastern central Japan.

The compatibility of whaling and whale watching has been debated by whaling and non-whaling countries within the International Whaling Commission (IWC). Whaling can reduce the number of whales available for watching, change whale behavior, diminish the conservation value of whale watching, and potentially affect the larger tourism industry (Hoyt and Hvenegaard, 1999). Despite evidence of such impacts, following a return to whaling in 2003, Iceland has become one of the fastest growing whale watch destinations in the world, with five communities hosting more than 89,000 whale watchers in 2006 and receiving total expenditure of more than \$23 million US. Whale watching remains much more popular in non-whaling countries. As of 2006, four countries attracted more than 1 million whale watchers per year: the USA, Canada, Australia, and Spain (including the Canary Islands). According to the most recent worldwide figures (1998), more than 9 million people are going whale watching in 87 countries and overseas territories and spending more than \$1 billion US (Hoyt, 2001) (Table I). However, based on the substantial growth (1998–2006) noted in Australia, New Zealand, Iceland, the USA, and certain other countries, it is possible to make a minimum world estimate

for 2006 of 12 million whale watchers with total expenditure of \$1.5 billion US (IFAW, 2004; IFAW, 2005; Hoyt, 2007).

### IV. Whale Watching Conflicts and Regulations

Such explosive whale watching growth has led to management problems. Typical scenarios include too many boats on the water in a limited area, too many close approaches and sometimes collisions with cetaceans, strain on the infrastructure of local communities from too many visitors, and a lack of guidelines and regulations and/or enforcement of them.

Some operators have formed associations to devise self-imposed guidelines, but most have waited for researchers or NGOs to suggest guidelines or for government to try to impose regulations (Carlson, 2004). Yet even where regulations do exist, enforcement tends to be minimal or absent. In the USA, however, cases have been prosecuted with substantial fines levied against boat operators, as well as researchers and photographers, who approach too close or too aggressively to whales or who operate without a permit. In Hawaii, a film maker was fined for harassing whales when his close-up underwater video of a short-finned pilot whale (*Globicephala macrorhynchus*) mouthing a woman researcher was sold to television.

In 1983, the first whale watch fatality occurred when a mature gray whale overturned a small boat in Laguna Ojo de Liebre (Scammon's Lagoon), Mexico, killing two tourists. Until 1995, this was the only fatal whale watch accident. Then, all in the space of a year, in the Dominican Republic, the upper deck of a crowded boat collapsed after being hit by a wave, killing one tourist and injuring others, and in Kaikoura, New Zealand, a boat overturned, fatally trapping a person underneath. In the same period, on a sightseeing trip near Baffin Island in the Canadian Arctic, a surfacing whale overturned a 5.5m boat and four tourists died of exposure. Only their guide survived. He was wearing a survival suit.

The number of injuries and fatalities is small considering the millions of people who go whale watching every year. Whale watching is by and large safe for both people and whales. Still, whale watch boats have struck whales, injuring, or even killing them, whereas other boats have been accidentally overturned by whales. Many more accidents have happened due to problems with the boats themselves or

TABLE I  
Estimated Growth of Whale Watching Worldwide

Year	Number of whale watchers	Direct expenditure (million USD) <sup>a</sup>	Total expenditure (million USD) <sup>b</sup>
1981	400,000	\$4.1 million	\$14.0
1988	1,500,000	\$11.0–16.0	\$38.5–56.0
1991	4,046,957	\$77.0	\$317.9
1994	5,425,506	\$122.4	\$504.3
1998	9,020,196	\$299.5	\$1,049.0 million
2006 <sup>c</sup>	12,000,000+	\$450.0+	\$1,500.0+

<sup>a</sup>Direct expenditure = Cost of whale watch tour (ticket price).

<sup>b</sup>Total expenditure = The amount spent by tourists going whale watching from point of decision, including transport, food, accommodation, and souvenirs, as well as ticket price, but not including international air fares.

<sup>c</sup>2006 figures are minimum estimates only.

with overloading—things that are not specific to whale watching but could happen as part of any type of marine tourism. Indeed, most if not all of the accidents to date could have been avoided with due care and precaution.

Perhaps the greatest concern for safety is for the tours involving swimming or diving with cetaceans. Even these have a good safety record with thousands of encounters with dolphins in such places as New Zealand, the Bahamas, and Japan. Despite the generally strict protocol of no touching and approaching cetaceans, some have suggested that swimming with cetaceans should be banned or at least limited to certain dolphin populations or areas and that experienced researchers should always be present as guides to help interpret behavior and ensure safety. Swimming with whales, such as humpback whales on their mating grounds where there is surface active behavior, is potentially more dangerous to humans; despite criticism it continues in several areas of the world, and it remains controversial.

### V. Does Whale Watching Have an Impact on Whale and Dolphin Populations?

Since the late 1990s, researchers have tried to determine whether observed short-term effects on whales and dolphins from whale watching (approaching or avoiding boats, staying down longer, interrupting natural behavior) might be leading to long-term negative impacts (displacement, reduced reproductive success, or reduced survival rate). Concerns have centered around the presence of boats on critical mating, calving, feeding, and resting areas; the amount of time and the number of boats approaching close to the same whales; and the intensive whale watching of certain rare or endangered species. The problems are most evident with small, inshore populations of dolphins living in restricted areas such as Doubtful Sound, New Zealand; eastern Vancouver Island, Canada; and Shark Bay, Australia. In these populations, repeated exposure of individuals to boat-based whale watching is leading to long-term impacts (Report of the Workshop on the Science for Sustainable Whalewatching, 2004; Bejder *et al.*, 2006; Lusseau *et al.*, 2006). These studies highlight the sensitivity of small dolphin populations chronically exposed to whale watching. Yet even large whales sometimes show behavioral changes as a result of whale watching which, for some populations, may represent a threat.

There is much that can be done to manage the development of whale watching to minimize the risk from adverse impacts. In some areas of the world, watching from a large, quiet ship may reduce the pressure exerted by numerous small boats, whereas watching from a land-based lookout can eliminate negative effects on the animals. Well managed whale watching begins with a protective government policy with sensible regulations and an enforcement regime to control the numbers of boats on the water with cetaceans and to limit their approach and the amount of time they spend with cetaceans (IFAW *et al.*, 1995). The Whale and Dolphin Conservation Society has suggested a practical, precautionary plan whereby one-third of every whale and dolphin area and one-third of daylight hours be kept free from any whale watching activity (Hoyt, 2007). Such restrictions on areas and times would also prove useful as controls for researchers doing comparative studies. Equally important for management is the education of whale watch operators, passengers, and other mariners using their boats in whale watch areas. Central to this is the role of the naturalists, or guides, who are the public face of whale watching and marine protected areas, and act as the bridge between the largely urban whale watchers and the sea. Naturalists play an essential conservation role with their ability to shape through their words and actions

TABLE II  
Brief, Useful Guidelines for Boat Operators<sup>a,b</sup>

1. Do not pursue, overtake, head-off or encircle cetaceans or cause groups to separate.
2. Never approach whales/dolphins head on.
3. Avoid sudden changes in noise level (gear shifts and reverse, unless necessary to back away slowly from a surfacing whale or dolphin group).
4. Reduce speeds in areas where whales may be sighted; approach and leave whales cautiously and slowly.
5. Extreme caution is required when any of the following is present: (a) feeding whales, (b) cow/calf pairs and juveniles, (c) resting, (d) breeding or rowdy groups, or (e) socially active groups. Cetaceans engaged in such behavior are particularly sensitive to disturbance and may be vulnerable to collisions.

<sup>a</sup>This is not a complete list covering every situation but is meant to provide some general suggestions and overall direction for the use of operators offering whale watch tours as well as wildlife managers who are establishing guidelines or regulations on whale watching.

<sup>b</sup>Adapted from IFAW *et al.* (1997).

the way whales and dolphins and the marine environment are perceived and ultimately respected (IFAW *et al.*, 1997; Hoyt, 1998, 2007).

### VI. Whale Watching and Conservation

In 1983, the IWC co-sponsored the “Whales Alive” conference in Boston, Massachusetts, which examined the “non-lethal” uses of whales. Ten years later, in 1993, the IWC adopted a whale watching resolution prepared by the Whale and Dolphin Conservation Society and successfully proposed by the UK at the IWC annual meeting in Kyoto, Japan. The underlying strength of the argument that the IWC should become involved in whale watching was that, since the IWC moratorium on whaling, the most prevalent “use” of cetaceans among IWC members has been whale watching. However, despite majority agreement on the relevance of whale watching to the IWC, delegates from Japan have repeatedly stated that the IWC has “no competence” concerning whale watching matters.

From 1995 to 2000, a series of six international workshops, organized by the International Fund for Animal Welfare (IFAW), with assistance from the Whale and Dolphin Conservation Society, Tethys Research Institute, World Wide Fund for Nature, and others, brought together more than a 100 cetacean experts from some 25 countries to explore the socioeconomic, educational, and legal aspects of whale watching, as well as the scientific aspects of management. The first of these, the seminal Scientific Aspects of Managing Whale Matching workshop, held in Italy, recommended a precautionary approach to management with a periodic review of regulations based on continuing research and monitoring into possible effects on cetaceans (sample guidelines for boat operators are provided in Table II) (IFAW *et al.*, 1995). The overall impact of this and later workshops has been to focus the debate on the status of whale watching, pointing out that better regulations were needed as well as enforcement, that whale watching had substantial unrealized potential in terms of education and science, and that, economically, whale watching was worth far more than had previously been determined, although some values were difficult to measure in terms of dollars alone (Hoyt, 2005, 2007).

**TABLE III**  
**Educational Values of Whale Watching<sup>a</sup>**

1. Whales are emblems for promoting awareness of endangered species and habitat protection.
2. Whale watching provides the opportunity for people across all ages and cultures to become familiar with environmental issues and to become involved in conservation efforts on a personal, local, regional, national and international level.
3. The development of education programs forges links between the whale watch industry and local communities as well as building bridges between the general public and scientific communities.
4. Natural history knowledge gained through whale watching has intrinsic value.
5. Whale watching provides an opportunity to observe animals in the wild, transmitting factual information and dispelling myths.
6. Whale watching is a model for marine educational programs in adventure travel and ecotourism.
7. Whale watching provides the opportunity for appreciation and understanding of local history, culture and the environment.

<sup>a</sup>Adapted from IFAW *et al.* (1997).

Perhaps the most valuable legacy of whale watching has been the building of a constituency out of the general public that is interested in and sympathetic to marine mammals, the sea, and marine conservation, including marine protected areas. The designation of Stellwagen Bank as a US National Marine Sanctuary in 1993 was largely the result of public interest in whales in New England and in the northeastern US through whale watching. Several million people encountered whales in the wild between 1975 and 1992, saw the research being conducted on whale watching boats, and learned about the whales and problems of the sea, which led to overwhelming popular support for the sanctuary (Hoyt, 2001).

Since the late 1980s as whale watching has expanded, however, it has become less educational in some areas of the world (Table III). A 1998 world survey of whale watch operations found that only 35% of all operators had enlisted naturalists to guide their trips (Hoyt, 1998). In terms of the scientific content, about 9% of operators worldwide had researchers or naturalists on board who conducted regular photo-ID and other research as part of their trips, whereas 57% never conducted scientific research or even offered information to scientists. Most operations were strictly commercial ventures. Clearly, a great deal more could be done to encourage whale watching tours to offer the maximum benefits to local communities and regions in terms of education, science, and conservation, as well as earning tourism dollars, while at the same time protecting the whales and ensuring that they will remain in coastal waters and accessible to whale watchers for generations to come.

### See Also the Following Articles

Conservation Efforts ■ Ethics and Marine Mammals ■ Marine Protected Areas ■ Popular Culture and Literature

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