Annex M

Report of the Sub-Committee on Whalewatching

Members: Kato (Chair), An, Bass, Bjørge, Carlson, Cozzi, Engel, Fortuna, Funahashi, Gales, Groch, Iniguez, Gedamke, Kim, Iwasaki, Lee, Lovell, Mattila, Ohsumi, Palazzo, Panigada, Park, Parsons, Porter, Punnett, Rambally, Ritter, Robbins, Rojas, Rose, Simmonds, J., Simmonds, M., Sironi, Sohn, Stachowitsch, Tominaga, Urban, Weinrich, Williams, Wilson, Yamakage (I).

1. CONVENOR'S OPENING REMARKS AND TERMS OF REFERENCE

Kato welcomed the members of the sub-committee and noted the priority items identified by the Scientific Committee (SC): (1) assessing the biological impacts of whalewatching on whales; and (2) development of the scientific foundation of whalewatch guidelines. In addition, the following items were identified: (1) review of whalewatching guidelines and regulations; (2) reports from intersessional Working Groups (definitions of types and categories of whalewatching and further development of precautionary approaches as a science-based framework for management of whalewatching); (3) review of potential impacts of 'swim-with' programs on populations of cetaceans; and (4) review of risks to cetaceans from high-speed whalewatching vessels.

2. ELECTION OF CHAIR AND APPOINTMENT OF RAPPORTEURS

Kato was elected Chair and Carlson was appointed rapporteur with assistance from Rose.

3. ADOPTION OF AGENDA

The adopted Agenda is given as Appendix 1.

4. REVIEW OF AVAILABLE DOCUMENTS

The documents available to the sub-committee were identified as: SC/57/WW1-8; SC/57/E8.

5. REPORT OF INTERSESSIONAL WORKING GROUP

SC/57/WW4 presented the report of the intersessional correspondence group on definitions of types and categories of whalewatching. The definitions were developed to help clarify discussions on whalewatching activities. One member noted that the report appeared to imply *a priori* that some types of whalewatching would have greater impacts than others and that this assessment is best left to member nations and managers to decide on a case-by-case basis. After a brief discussion, a small Working Group was formed to restructure the definitions. A glossary of types and categories of whalewatching, recommended by the sub-committee, is presented in Appendix 2. The types of whalewatching activities are illustrated in Fig. 1.

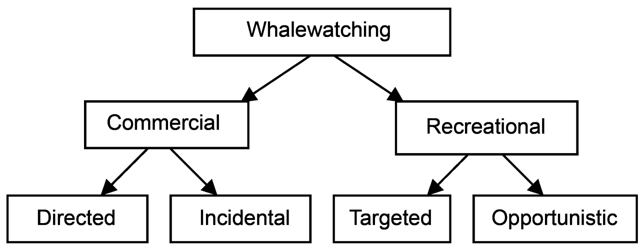

Fig. 1. Types of whalewatching activity.

It was noted that the intersessional Working Group on further development of precautionary approaches as a science-based framework for management of whalewatching was not convened during the intersessional period. The sub-committee **agreed** that this issue remained of high priority. In addition, the report of the Workshop on Science for Sustainable Whalewatching, held in South Africa in 2004 and discussed at last years meeting is not yet accessible on the web; a summary of the workshop is available in IWC (2005) and the report (Anon., 2004). The sub-committee noted the importance of the Workshop and of continued progress in the development of a science-based framework for the management of whalewatching and **recommended** that the report be made available through a website linked to that of the IWC.

6. BIOLOGICAL IMPACTS OF WHALEWATCHING ON WHALES

SC/57/WW3 summarised studies on the impacts of whalewatching activities on cetaceans published over the past year. Scheidat *et al.* (1984) described a land-based survey of humpback whale (*Megaptera novaeangliae)* behaviour in the presence of whalewatching boats, to measure avoidance reactions. Results of the study, conducted in Machalilla National Park, Ecuador, showed increased swim speeds in response to whalewatching vessels (2.97km h^{-1} to 4.52km h^{-1}). When whales entered the study area accompanied by whalewatching vessels, their speed did not diminish, although their route 'became significantly more direct' and adopted a more 'predictable' path. The results of this natural experiment lead the authors to recommend to whalewatchers a simple way to identify and mitigate impact in the field. If operators had to increase speed to keep up with the whales, then they could interpret this as a signal that they were disturbing the animals.

Goodwin and Cotton (2004) investigated the effects of vessel presence, type and behaviour on dolphins in Teignmouth Bay, UK. The results indicated a significant correlation between dolphin behaviour and boat type when boats were moving. Dolphins frequently demonstrated avoidance behaviour in the presence of moving planning-hulled boats but not with displacement-hulled or non-motor boats.

Buckstaff (2004) investigated the effects of all types of watercraft noise (including recreational and whalewatching vessels) on the acoustic behaviour of a group of bottlenose dolphins (*Tursiops truncatus*) near Sarasota, Florida, USA. The dolphins whistled significantly more often and swam in tighter groups when boats approached. The author expressed concern that increased whistle rate may impose additional energetic costs resulting in long-term, cumulative impacts to the animals.

Orams (2004) reviewed research on the impacts of whalewatching, noting that often research lags behind the explosive development of the industry and that research on impacts is generally conducted after the industry has been established. The paper discussed the challenges in conducting research on the impacts of whalewatching, but gave examples of several studies in New Zealand, often using innovative techniques, that have successfully investigated this issue. Although some studies do not report statistically significant effects, Orams emphasised that this does not necessarily mean there are no biologically significant effects and suggests the following for impacts research: (1) design experimental studies involving controls; (2) identify behaviours and events that can be practically measured and observed; (3) calculate cetacean activity budgets in the presence and absence of whalewatching activity; (4) emphasise investigating whalewatching impacts in populations and species that are already threatened or facing problems, in addition to tourism; and (5) measure and observe potential indicators of stress and population level effects.

Bejder and Samuels (2003) reviewed existing research on the impacts of tourism activities on cetaceans and identified several short-term studies with well-planned and executed experimental designs. They identified innovative and useful techniques and methodologies that have succeeded in assessing the short-term, as well as cumulative, impacts of cetacean tourism. The authors indicated that the success of the studies was largely due to their incorporation of: (1) multiple research platforms; (2) appropriate behavioural sampling techniques; (3) simultaneously measuring multiple responses; (4) supplementing opportunistic sampling with controlled experiments; (5) analysing existing and historical data; and (6) incorporating innovative technologies, such as acoustic tagging and remote monitoring. They concluded that incorporation of these elements would allow for the availability of additional 'sound scientific evidence as the basis for informed management policies'.

As an example of a longitudinal study, Bejder (2005) made use of a long-term research project (>20 years) on bottlenose dolphins in Shark Bay, Australia. The study documented significant changes in dolphin movement and habitat use in response to vessel approaches. Of particular significance was an apparent negative effect of tourism disturbance on dolphin reproductive success.

The sub-committee thanked Parsons for this useful review and requested that he continue to provide a review of relevant papers to the sub-committee next year. One member suggested that future reviews be presented in two parts – large and small cetaceans. Parsons agreed to prepare a review for next year with two divisions as requested.

SC/57/WW5 also reviewed some selected, recent key research and considered the implications for future whalewatching research and management. Work by Lusseau has looked at two adjacent but isolated populations of bottlenose dolphins, *Tursiops truncatus*, in New Zealand (Lusseau, 2003; 2004). The two dolphin populations are exposed to differing levels of tourism but live in similar habitats. This situation allowed Lusseau to evaluate the dolphins' short-term avoidance strategies and the threshold at which they no longer became effective. The dolphins at the more heavily exposed site avoided boat interactions and if these interactions were too intensive, avoided the area itself. Lusseau (2003) suggested that the switch to avoidance of the area occurred when less than 68 minutes occurred between successive boat interactions.

Studies by Constantine *et al.* (2003; 2004), which took a similar approach, showed that bottlenose dolphins in the Bay of Islands, also in New Zealand, were more strongly affected by 'permitted' dolphin-watching boats than any other craft. In particular, milling behaviour increased and resting behaviour decreased in their presence. Attention also was drawn to the work of Williams *et al.* (2002) and Erbe (2002). Finally, SC/57/WW5 drew attention to the significant review (complete with abstracts) of other key literature, including specific case studies of short-term behavioural responses, provided by Bejder and Samuels (2003). The purpose of their review was to promote careful research designs to investigate the effects of human activity on free ranging cetaceans and was therefore very helpful to those contemplating such research.

Several sub-committee members commented favourably on the innovative, quantitative methodologies in the papers reviewed, particularly those that examine linkage between short- and long-term impacts. It was further noted that the presence of Bejder, Lusseau and Samuels, who were invited but unable to attend the meeting this year, would have greatly enhanced the work of the sub-committee. The sub-committee therefore **recommended** that Invited Participants with this level of expertise be funded and invited to next year's meeting.

SC/57/WW7 describes the increase of whalewatching efforts on humpback whales along the Bahia and Espírito Santo State coast, an area encompassing the main breeding ground of this species in Brazil. The humpback whale population off Bahia is increasing its range, reoccupying historic areas of occurrence, from Abrolhos Bank to the northern coast of the State. During the last four years, whalewatching activities also have increased along the coast of Bahia State. Seventeen specific locations along the coast were identified for this study. These include seven villages where whalewatching has developed and ten with potential for development due to the presence of hostels and hotels, access facilities such as roads, airports and bus stations, accessible harbours, and high concentration of humpback whales.

Comparative results on the development of whalewatching activities in Praia do Forte show a growing interest in this activity. A four-year partnership with the primary whalewatching operation has resulted in: (1) scientific data collection using whalewatching cruises as an opportunistic platform (83 individual humpback whales photo-identified, in 517 sightings including 50 calves); (2) dissemination of environmental information to the local community and tourists; and (3) compliance with established regulations for whalewatching. Salvador, Itacaré and Prado started whalewatching activities in 2004 with technical support and in 2005 will start to generate scientific data. Caravelas has incipient whalewatch cruises and since 2004 also has technical support. In two other locations, Cumuruxatiba and Nova Viçosa, whalewatching started in 2002 without monitoring or technical support.

7. REVIEW OF PUBLISHED WHALEWATCHING GUIDELINES AND REGULATIONS

In Brazil, whales are protected by Federal Law nº 7643 against hunting and disturbance and by Edict 117/96 (modified by Edict nº 024 – 08/02/2002) that regulates whalewatching in Brazilian waters. Article nº 4 foresees restrictions for the accomplishment of whalewatching only inside Marine Protected Areas (MPAs), including: (1) registration of vessels; (2) maximum number of vessels engaged in the activity in the same area; and (3) restrictions on speed and routes. Article nº 5 states that any commercial tour vessel operating inside MPAs where cetaceans regularly occur must provide interpretative information on these animals and their conservation needs to passengers on a permanent basis. Due to the increase in the occurrence of humpback whales along the Bahia State coast outside of the MPAs, the authors suggest the Edict be changed to encompass the full range of the breeding area.

During discussions, some members stated their support of legislative revision and stressed its importance due to the growing humpback whale population along the Bahia State coast. When asked why no data were collected in some areas, the authors replied that in four areas whalewatching and its monitoring started only in 2004 and a data collection and monitoring programme would begin in 2005. In response to questions on impact studies, it was noted that two studies are in progress; one for a PhD thesis on humpback whales in Abrolhos and another for a Masters thesis in Abrolhos and Praia do Forte related to the disturbance of cow-calf pairs. The members welcomed this report and stressed the importance of presenting data on the impact studies at next year's meeting.

A land-based study is in progress to assess vessel impacts on Risso's dolphins (*Grampus griseus*) in the Azores, an important feeding, breeding and nursery area for the species. Results indicate that Risso's dolphins significantly decreased their resting behaviour when the number of boats in the area increased, responding to the presence of boats as soon as they were present in the bay. In addition, their resting period shifted to midday, when the average number of boats in the area was relatively low, possibly adapting to a less favourable situation. Some members noted concerns on the methodologies used and feedback to the researchers was requested. It was noted that one study in this region is conducted using boats equipped with jet-drive engines that are designed to be quiet underwater and that an important component of the study would be to attempt to link vessel acoustics to behavioural response.

SC/57/WW2 details the present state of whalewatching regulations in Argentina. Every year since 1999, researchers from the Instituto de Conservacion de Ballenas/Whale Conservation Institute (ICB/WCI) have held a meeting with whalewatching captains at Península Valdés, Argentina to facilitate information exchange and present recent advances in whale research. In 2003 the captains expressed their concern about the growing tourism activity at Península Valdés and mentioned a number of ethical issues that they wanted to address. In September 2004 ICB/WCI organised a meeting with whalewatching company owners, boat captains, government officials and researchers to discuss ways to improve the current laws while minimising the impact to the animals.

The number of tourists going on whalewatching boats to see southern right whales on this nursery ground has increased dramatically over the past 14 years. Between 1991 and 2004 the number of tourists increased almost 450%, from 17,446 to 96,436. The number of boat trips in 2004 was 3,320. There is a new management plan to restrict access to Península Valdés to 200,000 tourists year^{-1}, with up to 100,000 allowed to go on whalewatching tours.

The first whalewatching regulations for Península Valdés were created in 1984 by adapting laws from other countries. At present, several aspects of the regulations are not applicable. Participants at the workshop agreed that the process to update the law could take years. Therefore, they proposed to create a Voluntary Code of Conduct that would be in effect for the short term until Government agencies change and implement the regulations. The Code of Conduct is not a law; therefore, its success depends on voluntary acceptance by all local companies. Once accepted, the whalewatching operators would be expected to supervise whalewatching activities for their common benefit. The Whale Watching Guide Association (under formation) volunteered to lead the process to create the Voluntary Code of Conduct that would include, for example, numbers of boats per whale, vessel speed, vessel behaviour in the presence of whales and direction of approach. The Code of Conduct will be printed and distributed to visitors at the entrance to the Península Valdés Natural Area so they will understand the captain's decisions and can take an active role in enforcing the Code. A second workshop is being organised for July. The goal is to finalise the Voluntary Code of Conduct so that it can be printed and distributed during the 2005/06 and future seasons. Government officials who attended the first workshop stated that they are working on the process to change and improve the current whalewatching laws in Argentina.

The sub-committee welcomed this approach to reducing the impacts of whalewatching. When asked if there were any plans for monitoring, the author replied that his group has a good relationship with the operators and will try to monitor when possible. Also, a PhD student has been monitoring compliance and impacts for the past few years. When asked if there was a distribution shift in the population with increased whalewatching in the area, the author replied that the spatial distribution of right whales around Península Valdés had changed over the last three decades. In the 1980s right whales abandoned the Outer Coast and gradually moved to Golfo Nuevo and Golfo San José (to the South and North of the peninsula, respectively). By the 1990s Golfo Nuevo had the highest proportion of females with calves and few whales seen along the Eastern Outer Coast (Rowntree *et al.*, 2001), a pattern that has continued to the present. Interestingly, the centre of the growing concentration of cow-calf pairs in Golfo Nuevo is located along its northern shore, less than 10km from Puerto Pirámide, the hub of the whalewatch industry in Península Valdés. The movement of right whales from the Outer Coast, where there is no boat activity, to Golfo Nuevo occurred concurrently with the growth of whalewatching activities in the Gulf.

One member pointed out that even though Península Valdés is a world famous area with a long whalewatching tradition, whalewatching regulations in Argentina are outdated and there are problems with enforcement. Another member commented that this is in fact a good example of why the whalewatching sub-committee is useful and necessary – its role should be to provide scientific advice in situations like this, where improvements have to be made in the law and advice from specialists is needed. Some members commented that it is important to encourage and support this kind of work as it integrates the different stakeholders involved in whalewatching activities, including government officials, local whalewatching captains, company owners, tour guides and researchers.

SC/57/WW3 also summarised various studies on the effectiveness of whalewatching guidelines and regulations published over the past year. Lusseau (2004) described interactions between tourism vessels and bottlenose dolphins in Doubtful Sound, New Zealand. Of these interactions, 66% violated New Zealand Marine Mammal Protection Regulations, with a third of encounters involving more than one violation. Permitted vessels violated regulations at a slightly higher rate than those without permits (35% of encounters involved violations for permitted operators vs. 29.7%). The study estimated that based on rates of risk presented in other cetacean tourism studies (e.g. Samuels and Bejder, 2004), dolphins are 'at risk' once every seven minutes when interacting with tour boats and once every three minutes when interacting with other vessels.

Scarpaci *et al.* (2004) investigated tour operator compliance with swim-with-cetacean regulations in Port Phillip Bay, Victoria, Australia, an area where bottlenose dolphins are the focus of activities. The level of compliance was investigated before and after a review of the whalewatching permitting process, which in turn was the result of a previous study showing lack of compliance with whalewatching regulations (Scarpaci *et al.*, 2003). For two of the regulations there was a decrease in levels of compliance (Scarpaci *et al.*, 2004): the rate of illegal approaches by vessels and their mean time in close proximity to a dolphin. The authors suggested operators may 'adhere better to simple conditions with a single numerical value' and also, '[r]egulations designed by managers…should be written in a manner that can be comprehended by the tour operations, are realistic in the field and are easily enforceable'.

SC/57/E8 (p.14) addresses concerns about tourism in Antarctica. The number of tourism vessels has increased from 12 to 47 in the past decade. A continued, unregulated growth in tourism could pose a threat to Antarctica's wildlife, including cetaceans. Therefore, the Antarctic treaty nations are interested in developing a co-ordinated approach to the management of tourism that includes whalewatching activities.

It was noted that Antarctica was highlighted this year in the Standing Working Group on Environmental Concerns. As whalewatching may be an added stressor in the region and treaty nations are interested in developing a regime for tourism management, it was suggested that the sub-committee consider collecting data on whalewatching activities in the area. The sub-committee **agreed** that information on whalewatching activities and research conducted from whalewatching vessels in Antarctica should be presented at next year's meeting and that members should actively solicit papers for review.

It was reported that the compendium on whalewatching guidelines and regulations around the world (Carlson, 2004) is being updated. The updated version, when complete, will be posted on the IWC's website. ICB/WCI, Argentina translated the worldwide compendium of guidelines and regulations into Spanish. The author thanked the group for this enormous and very useful work and suggested that the Spanish version be linked to the IWC website. It was noted that the compendium shows a broad degree of common recommendations and some notable exceptions. For example, most guidelines discourage operation of vessels in reverse while in close proximity to whales, while others encourage this practice to avoid being within a set distance of whales. It was suggested that members of the sub-committee make general recommendations on such practices.

8. DEVELOPMENT OF THE SCIENTIFIC FOUNDATION OF WHALEWATCHING GUIDELINES

Whalewatching regulations, varied by region and species, have been created in various locations to mitigate impacts. Guideline design is often limited by applicable scientific research on those populations. SC/57/WW1 reviews 48 scientific peer-reviewed and grey literature articles involving impacts of whalewatching on cetaceans, characterised by species, location, methods and potential sources of impact, including vessel distance, speed, direction and noise. The aim of the review is to highlight available research results that could facilitate the development of science-based regulation. Results indicate that the majority of cetacean reactions appear to be elicited by the speed and direction of whalewatching vessels. Noise also appeared to play an important role in the disruption of cetacean vocalisations; however, there is potential for study design bias. The authors concluded that there is a body of evidence, varying by species and location, that can provide very important information about cetacean reactions to whalewatching vessels and can provide guidance for a science-based formulation of new regulation or the revision of current ones.

The authors further suggest that areas where extensive whalewatching research has been conducted, in particular those where long-term studies exist, can provide research models for whalewatching locations looking to develop a whalewatching research program.

During discussions, one member asked if the same range of responses was found when separating peer-reviewed from grey literature and controlled versus non-controlled experiments. In response, the author replied that such analysis had not been conducted, but that it would be possible to complete before next year's meeting. One member stated the importance of reviewing both published and grey literature, as it is difficult to publish reports where there is no impact. One member also suggested that further analysis be conducted with studies of baleen whales separated from toothed whales.

Whalewatching studies published over the past year, summarised in SC/57/WW3, were discussed in detail under other agenda items and their relevance to the scientific foundation of whalewatching guidelines incorporated into and discussed in SC/57/WW1 and SC/57/WW5. An additional study by Goodwin and Cotton (2004) was summarised. The authors suggested that guidelines incorporate speed restrictions and distances between boats and animals due to significant behavioural responses to fast-moving, planning-hulled vessels, but not other categories of boats studied (e.g. slow-moving displacement hulled vessels).

It was noted that the majority of authors cited in SC/57/WW5 actually provided management advice, linking it to their research. Williams *et al.* (2002), for example, considered the voluntary code of conduct requesting that boats do not approach closer than 100m and concluded that weakening whalewatching guidelines or not enforcing them would result in higher levels of disturbance. Similarly, Constantine *et al.* (2004) stated that their data 'could be used to implement precautionary management schemes that take into account the potential long-term cumulative effects of disturbance on this isolated [Bay of Islands] population' and Constantine *et al.* (2003), recommended 'line-abreast' placement of swimmers (for 'swim-with' tours) and that no whalewatch permits should be issued for the Bay of Islands on the simple grounds of reducing disturbance. Similarly, they recommended a change in operating times, so that the dolphins were provided with 'large blocks of time where there are no dolphin-watching boats on the water'. It was suggested that the very precise information provided by Lusseau (2004) potentially tells managers that if boat interactions become too intensive they are self defeating, because the animals may move away from the area and gives a measure of how intensive the interactions can be before this occurs.

The sub-committee noted that while the exemplary studies cited in SC/57/WW5 strictly relate to specific localities, populations and species and that duplication of such refined investigations will not be possible everywhere, some extrapolation to other situations may be appropriate and pragmatic. It was suggested that it might be acceptable to use information from studies conducted on inshore bottlenose dolphin populations to help develop management measures for the same species in similar circumstances in another geographical location. However, relating these same studies to the management of a whalewatching operation focused on a migratory baleen whale population may be less sensible. Nonetheless some basic management actions were indicated in the studies considered, including (1) control of numbers of whalewatching vessels; (2) the amount of noise that they produce; and (3) their speed and other precautionary forms of management, including providing whalewatching boat-free areas and times (e.g. a third of daylight hours: Simmonds, 2004).

A question was raised about the frequency with which time area closures are used by managers and whether they are an important aspect of management for some locations. In response, several regions using them were cited including: (1) dolphin watching areas in New Zealand; (2) gray whale breeding lagoons in Mexico; and (3) southern right whale nursery areas in Argentina. One member noted the importance of impact studies on noise, the most overarching principle and impact and the importance of collecting data on ambient noise as well as the noise vessels emit. Another member stated that ambient noise levels may increase, even in areas where regulation is adhered to, if there is an increase in vessel traffic. Canary Island whalewatching regulations were brought to the sub-committee's attention as all whalewatch vessels are profiled for sound. It was noted that this would be an excellent basis for experimental studies and that such studies should be conducted whenever possible.

In principle, all human activities in close proximity to cetaceans will impact the animals. Therefore it is critical to identify management objectives and then develop a management procedure that links the knowledge base to regulation. This management procedure should include an assessment of the risk associated with anthropogenic disturbance in close proximity to cetaceans and describe the relation between level of disturbance and effect on the cetaceans. As a Precautionary Approach, whalewatching activities should be regulated well within the levels that have no significant, detrimental effect on cetaceans. The level of whalewatch activities that will be allowed might differ between areas and countries, taking into account e.g. socio-economic conditions and will reflect the level of risk the respective managers are willing to take.

It was noted that one of the recommendations of the Workshop on Science for Sustainable Whalewatching was to conduct risk assessment analyses. The sub-committee **agreed** that an intersessional Working Group be established and its terms of reference on this subject be defined.

9. OTHER TOPICS

9.1 Review of risk to cetaceans of high-speed whalewatching boats

SC/57/WW8 presented a review of known collisions between whalewatching boats and whales worldwide. Records were identified from a review of existing literature, requests for information from targeted marine mammal email distribution lists, and specific requests for information from sub-committee members with knowledge of local industries. For records in which participants could be located, a suite of information regarding the strike was requested. Encounters where the boat was stationary when the whale contacted the vessel were discarded.

In all, 32 records were identified between 1984-2003, 31 of which were from North America and one from Norway. The records reported are likely to be an under-representation of the actual number of collisions that have taken place and the North American bias may represent more developed industries (with more passengers likely to report a strike) and regional laws making it illegal to hit a whale. Seventeen collisions were with humpback whales, two with minke whales, nine with fin whales and one each with gray, sperm and killer whales (in one case the species was not known). The bias towards humpback strikes likely represented the focus of the industries, rather than a particular tendency of the species to be struck.

Collisions were evenly split between those that occurred in transit (14) and while whalewatching (14) and three occurred during the transition between the two states. The majority of collisions took place with whales that were not the focus of whalewatching activities. In 16 cases the whale that was struck was not seen prior to collision; its presence was known of in only six. Four of the collisions were known to have resulted in serious injury to or mortality of struck whales, while 15 of the collisions resulted in reports of either no apparent damage to the whale or seemingly minor injuries. Of the eight collisions that took place when boats were travelling at speeds of 18 knots or higher, three resulted in serious injury or mortality to the whale and only one resulted in a minor injury (in three cases the extent of the injury was unknown). Three of the four collisions resulting in major injuries or fatalities involved vessels greater than 30m in length. Results indicate that whalewatching vessels present the highest risk of seriously injuring or killing a whale when larger vessels transit at high speeds. This indicates the need for caution as whalewatching industries increase the use of larger, faster whalewatching boats. However, risks from whalewatching boats may not be substantially higher than any other transiting vessel in the same area.

The sub-committee expressed their appreciation to the author and expressed interest in receiving more information next year. In discussions, one member noted the relevance of this issue to the Humpback Whale Sanctuary in Hawaii. To this end, some of the whalewatching companies met to discuss conditions under which near misses occur. The result of the discussions was the development of a data collection form to be used on whalewatching vessels. The sub-committee expressed interest in this process as well as the results and requested the data be presented at next year's meeting.

Further discussion addressed high-speed vessels, vessel size and risk assessments. One member stated that the most effective management measure is reduction of speed and that managers should consider this when drafting regulations. It was noted that ASCOBANS is monitoring high-speed vessel activity and that in addition, a risk assessment analysis was conducted for the Canary Islands. One member stated that the general increase in whalewatching activities in many regions may increase risk of strikes to cetaceans, especially as the vessels keep returning to the same area where animals previously concentrated. Other members stated that in feeding areas whalewatching vessels are not the only vessels in the area; there are fishing and recreational vessels as well and that risks will vary by area. It was noted that the shape of a vessel's prow might be a factor to consider (as a narrower leading edge may increase boat strike pressure), although it was stated that there has been no assessment or data collection on this issue.

Based on the evidence presented in SC/57/WW8, the sub-committee **agreed** to provide the following scientific advise for whalewatch management: whalewatching vessels, as well as other vessels, are at an increased risk of striking a whale within a set distance (2 or 4km) of the sighting of another individual. It further states that whales struck often will not be sighted prior to the strike. The severity of injury from a strike is likely to increase as a function of the force of the strike. Since a key component of force is the speed at which the animal is struck, reducing speed in the vicinity of a sighted whale is likely to reduce the severity of a strike and may have the auxiliary benefit of allowing operators increased time to avoid a strike altogether. This may be especially important in cases where relatively large whalewatching boats are used, since their size could also lead to increased force and therefore, injury if a strike were to occur.

New technologies, in particular D-tags used to study responses of whales to approaching vessels were discussed briefly. Currently, studies using D-tags are being conducted in several areas including Massachusetts, USA (humpback whales), Hawaii (humpback whales) and the Canary Islands (beaked and pilot whales). The tags record dive depth, orientation, pitch and roll and acoustics. One member noted that one restriction of the technology may be the large sample size required for statistically robust results.

9.2 Review of potential impacts of 'swim-with' programmes on populations of cetaceans

SC/57/WW3 summarised several recently published studies on swim-with-cetacean tourism. These studies included one of the possible effects of swim-with-dolphin tourism in Hawaii on spinner dolphins (Courbis, 2004), which noted changes in habitat use attributed to tourism activity. The author expressed concern that changes in the dolphins' behaviour, in response to boat traffic and swimmers, may be affecting their ability to rest, breed and socialise.

Samuels and Bejder (2004) investigated the effect of swim-with-dolphin activities on bottlenose dolphins in Panama City Beach, Florida. Specific dolphin behaviours were described that are deemed to be indicative of chronic human interaction (e.g. dolphins remaining within touching distance of one or more humans in the water, or a vessel and accepting fish and/or other food items handed to them by humans). The study also identified several behaviours exhibited by humans and dolphins that might pose a risk to dolphins; for example, humans coming in physical contact or touching distance, dolphins approaching close to a vessel and humans feeding dolphins. The study further noted the rate at which dolphins and humans came into physical contact, which might, in turn, lead to human injuries or transmission of diseases to or from humans. It was estimated that humans were put at risk every 29 minutes. The authors noted that the methods used in the study could be a useful blueprint to quantify rates of behaviour that put humans and dolphins at risk during tourism activities as well as quantifying the proportion and age classes of the cetacean population that may be particularly at risk.

Orams (2004) presented a summary of studies conducted in New Zealand demonstrating the effects of swim-with-dolphin tourism. Some of these studies highlight how complex the responses of animals can be to tourism activities and the difficulty in detecting and extracting data on the impacts of cetacean tourism. Several new and innovative research techniques that have been valuable in identifying and assessing impacts were identified.

SC/57/WW3 also noted several other studies on swim with cetacean tourism, including Scheer *et al.* (2004), who describe aggressive behaviour exhibited by short-finned pilot whales in response to human swimmers off Tenerife, Canary Islands.

At the request of the whalewatching sub-committee, SC/57/WW6 presented an update to Rose *et al.* (2003) on the occurrence of swim-with-whale operations worldwide. Several web searches for commercial swim-with-whale operators advertising on the internet (excluding operators only offering swims with small cetaceans) were conducted using a variety of keywords, phrases and search engines. In addition, a general request for information was sent to marine mammal email distribution lists and colleagues in areas where swim-with-whale operations were known or suspected to occur. For those operations with websites, the content of each was evaluated for information regarding guidelines (on the conduct of vessels and swimmers); conservation issues related to the targeted species or the region; human safety issues; certifications of staff; and research (projects on-going in the region or associations with researchers).

Fifty-one specific commercial operations were identified, an increase of 43% from 2003. The Kingdom of Tonga, the Great Barrier Reef, and Silver Bank (Dominican Republic) had the greatest concentrations of operations in both years. However, Tonga saw the greatest growth among the previously identified regions (an increase of five operators in two years); in addition, five previously unknown regions were identified, including the island of Mayotte in the Mozambique Channel and Rurutu, French Polynesia. Humpback and dwarf minke whales remained the main species targeted, although swims were also offered with sperm, bowhead, and blue whales. For humpbacks, swims occurred primarily in the clear, warm water of breeding grounds (e.g. Silver Bank, Mayotte, Rurutu). This raises concerns about impacts on calves and juveniles, age classes that may be more vulnerable to disturbance due to limited energy reserves.

The paper also noted a decrease from 2003 in the number of websites that mentioned conservation, human safety and research. Whale research, conservation and operational guidelines were all mentioned on less than 50% of sites. Nine sites did not mention any of the five content points. This may indicate that a growing proportion of operations are attempting to appeal to a customer base with only a passing interest in whales, rather than a more knowledgeable constituency who would view conservation or research as positive factors when choosing whether or not to participate in an excursion. In at least three countries (Argentina, Brazil and the Azores), whale swims were offered despite legislation specifically prohibiting swimming with whales. Studies on the effects of such programmes on the targeted individuals and populations remain infrequent, but will be essential in evaluating impacts if the current trend of industry growth continues.

The results reported in SC/57/WW6 are still only an imprecise estimate for the frequency of this activity as web searches were only conducted in English and several websites did not indicate whether they chartered the tour boat or owned the operation. The following steps were recommended by the authors for presentation at IWC/59, with an update at IWC/58, and **agreed** by the sub-committee:

(1) revision of the worldwide review of swim-with-whale programmes, using additional methods (e.g. additional languages) to understand the potential scope of the impacts on local whale populations;
(2) review published and ongoing studies of swim-with-whale programmes to determine the effect of such activities on target individuals and/or populations;
(3) identify data gaps that it would be necessary to fill in order to allow an assessment of the effects of such programmes on target individuals and/or populations.

Revision of methodologies, including the development of a questionnaire for operators and local experts, could be accomplished through an intersessional Working Group. One member suggested that information on accidents between swimmers and whales also would be of value. The sub-committee **agreed** that this work be addressed by an intersessional Working Group, to be discussed under the agenda item for a work plan.

9.3 Other

Mayr and Ritter (2005) reviewed photo-identification research and behavioural observations of rough-toothed dolphins conducted 2000-03 onboard whalewatching vessels operating off La Gomera (Canary Islands). The dolphins were found to have several distinct features suitable for individual identification, such as notch patterns on the fin, fin shape, variable body pigmentation and distinct scratches. Sixty-three individuals were identified, 65% of which were seen over more than one year, 37% within three or four years. This strongly suggests the existence of a resident population, signifying a higher vulnerability towards anthropogenic activities. As the formation of exceedingly tight subgroups is a distinctive behavioural peculiarity of rough-toothed dolphins, the Half Weight Index (HWI) was used to assess non-random associations between individuals in such subgroups. Association patterns indicated the existence of a structured organisation of rough-toothed dolphin groups/populations – including strong social bonds between mother and calves/juveniles and also between individuals of different age classes. The study, the first of its kind for this species, demonstrates the feasibility of the use of whalewatching vessels for dedicated photo-identification studies. Moreover, the method was applied to a new species, substantially increasing knowledge of the status and social behaviour of a species that is poorly understood. It was noted that this study highlights the importance of longitudinal data collection and the value of platforms of opportunity for this kind of study.

Commercial whalewatching operations can facilitate cetacean research by offering low-cost access to target populations. It was noted that photo-identification research has been paired with commercial operations in at least 38 countries worldwide (Hoyt, 1995), and a few research programmes have now operated continuously for nearly three decades. Eighty individuals or groups recently reported using whalewatching vessels as platforms of opportunity for scientific research (Palazzo *et al.*, 2004). In addition, Robbins (2003) reviewed 62 refereed scientific publications that were based largely or entirely on data from such platforms. Although humpback whales were best represented at the time of that review, peer-reviewed research involved at least seven mysticete and five odontocete species (including sperm whales). Published studies, based on data collected on whalewatching vessels, have addressed a wide range of management-relevant topics, including: distribution, stock identity, reproduction and survival rates, abundance, population composition, migratory destinations, behaviour and anthropogenic impacts. Some of these studies have contributed to the work of the Scientific Committee, such as in the 2001 Comprehensive Assessment of North Atlantic humpback whales. However, logistical and financial limitations can slow the pace at which whalewatching-based research emerges in the published literature (Robbins, 2000). There also may be areas where useful data could be collected from opportunistic platforms, but no programme is underway.

It was proposed that the whalewatching sub-committee make a dedicated effort to identify opportunistic sources of cetacean data of potential value to the work of the SC. This would include data that have direct value to planned analyses, or those that could guide future research efforts. Sub-committee members have detailed knowledge of the locations of whalewatching operations worldwide and so can identity areas, operations and/or data that are potentially relevant to upcoming SC needs. Furthermore, members have expertise in the scientific use of opportunistic data sets, which have their own limitations and biases (Robbins, 2000). The sub-committee could therefore provide a valuable service by scrutinising existing data collection programmes and archives, providing guidance to data collectors, seeking access to data that might address the scientific needs of the SC and encouraging new data collection in key areas. It was noted that the ultimate value of this work would depend upon close co-ordination with other sub-committees.

As a first step, the formation of an intersessional Working Group, with membership from other relevant sub-committees, to examine overlap between whalewatching activities, existing data collection programmes and upcoming SC priorities, was proposed. It was requested that the sub-committee solicit and review scientific information derived from opportunistic platforms and analytical techniques appropriate to such data. Several committee members commented on platforms of opportunity that collect photo-identification data and that these data have proven to be useful (e.g. IWC Antarctic Humpback Whale catalogue). One member stated that it was not appropriate to use data collected on whalewatching vessels. Others replied that such data have been useful to the SC and noted the contribution of whalewatching data to the 2001 Comprehensive Assessment of North Atlantic humpback whales.

The sub-committee **agreed** that this would be of value to their work and should be a priority item for next year. They further **agreed** that an intersessional Working Group be established when discussing the work plan for next year.

10. WORK PLAN

The work plan prioritised two major items as listed below:

(1) assessing the biological impacts of whalewatching on cetaceans;
(2) identifying data sources from platforms of opportunity of potential value to the SC.

The sub-committee also **agreed** that Antarctica would be a priority region.

In addition, the following items were recommended for the next meeting:

(1) reports from intersessional Working Groups: identifying data sources from platforms of opportunity of potential value to the SC; further development of precautionary approaches (e.g. quantitative risk assessment) as a science-based framework for management of whalewatching; and development of a questionnaire and improved methodologies to assess the extent and potential impact of swim-with-whale operations;
(2) review potential impacts of 'swim-with' programmes on population of cetaceans;
(3) review of whalewatching guidelines and regulations;
(4) review of risks to cetaceans from whalewatching vessel collisions.

The sub-committee discussed the work plan and prioritised as listed. They **agreed** that Intersessional Working groups be formed to:

(1) identify data sources from platforms of opportunity of potential value to the SC. Robbins agreed to Chair the group and Carlson, Mattila, Parsons, Ritter, Urban, Weinrich and Williams to participate. Further develop precautionary approaches (e.g. quantitative risk assessment) as a science-based framework for management of whalewatching. Simmonds (M.) agreed to Chair the group and Bjørge, Groch, Iniguez, Parsons, Ritter, Sironi and Williams to participate;
(2) develop a questionnaire and improved methodologies to assess the extent and potential impact of swim-with-whale operations. Rose agreed to Chair and Funahashi, Groch, Iniguez, Parsons, Ritter, Simmonds (M.), Sironi, and Weinrich, to participate.

11. ADOPTION OF THE REPORT

The report was adopted at 15:02 on 6 June 2005. The sub-committee expressed its thanks to Kato for chairing the meeting.

REFERENCES

Anon. 2004. Report of the Workshop on the Science for Sustainable Whalewatching, Breakwater Lodge, Cape Town, South Africa, 6-9 March 2004. Paper SC/56/WW12 presented to the IWC Scientific Committee, July 2004, Sorrento, Italy (unpublished). 28pp. [Paper available from the Office of this Journal].

Bejder, L. 2005. Linking short and long-term effects of nature-based tourism on cetaceans. Ph.D. Thesis, Dalhousie Univerity, Canada. 158pp.

Bejder, L. and Samuels, A. 2003. Evaluating the impact of nature-based tourism on cetaceans. pp. 229-56. *In:* N. Gales, M. Hindell and R. Kirkwood (eds.) *Marine Mammals: Fisheries, Tourism and Management Issues*. CSIRO Publishing, Collingwood. i-xii+446pp.

Buckstaff, K.C. 2004. Effects of watercraft noise on the acoustic behaviour of bottlenose dolphins *Tursiops truncatus* in Sarasota Bay, Florida. *Mar. Mammal Sci.* 20(4):709-25.

Carlson, C. (ed.). 2004. *A Review of Whalewatching Guidelines and Regulations around the World*. International Fund for Animal Welfare. 132pp.

Constantine, R., Brunton, D.H. and Baker, S. 2003. Effects of tourism on behavioral ecology of bottlenose dolphins of northeastern New Zealand. *DOC Science Internal Series* 153:1-26. Y; DOC Science Internal Series.

Constantine, R., Brunton, D.H. and Dennis, T. 2004. Dolphin-watching tour boats change bottlenose dolphin (*Tursiops truncatus*) behaviour. *Biol. Conserv.* 117:299-307. [Available from *www.science direct.com*].

Courbis, S.S. 2004. Behavior of Hawai'ian spinner dolphins (*Stenella longirostris*) in response to vessels/swimmers. Masters Thesis, San Fransisco State University, San Fransisco, CA. 188pp.

Erbe, C. 2002. Underwater noise of whale-watching boats and potential effects on killer whales (*Orcinus orca*), based on an acoustic impact model. *Mar. Mammal Sci.* 18:394-418.

Goodwin, L. and Cotton, P. 2004. Effects of boat traffic on the behaviour of bottlenose dolphins (*Tursiops truncatus*). *Aquat. Mamm.* 30:279-83.

Hoyt, E. 1995. The worldwide value and extent of whale watching 1995. A special report from the Whale and Dolphin Conservation Society. Bath, UK. 36pp. [Available from: *sarahcl@wdcs.org.uk*].

International Whaling Commission. 2005. Report of the Scientific Committee. Annex M. Report of the Sub-Committee on Whalewatching. Appendix 3. Summary of the report of the workshop on the science for sustainable whalewatching, Cape Town, South Africa, 6-9 March 2004. *J. Cetacean Res. Manage. (Suppl.)* 7:334-7.

Lusseau, D. 2003. Effects of tour boats on the behaviour of bottlenose dolphins: using Markov chains to model anthropogenic impacts. *Conserv. Biol.* 17(6):1785-93.

Lusseau, D. 2004. The hidden cost of tourism: detecting long-term effects of tourism using behavioural information. *Ecology and Society* 9(1):2.

Mayr, I. and Ritter, F. 2005. Photo-identification of rough-toothed dolphins (*Steno bredanensis*) off La Gomera (Canary Islands) with new insights into social organisation. *M.E.E.R.e.V* 5pp. [Available from *www.m-e-e-r.de*].

Orams, M. 2004. Why dolphins get ulcers: considering the impacts of cetacean-based tourism in New Zealand. *Tour. Mar. Environ.* 1:17-28.

Palazzo, J.T., Iñiguez, M.I. and Hevia, M. 2004. A worldwide directory of whale watching research. Paper SC/56/WW8 presented to the IWC Scientific Committee, July 2004, Sorrento, Italy (unpublished). 21pp. [Paper available from the Office of this Journal].

Robbins, J. 2000. The use of commercial whalewatching platforms in the study of cetaceans: benefits and limitations. Paper SC/52/WW8 presented to the IWC Scientific Committee, June 2000, in Adelaide, Australia (unpublished). 7pp. [Paper available from the Office of this Journal].

Rose, N.A., Weinrich, M. and Finkle, M. 2003. Swim-with-whales tourism – a preliminary review of commercial operations. Paper SC/55/WW4 presented to the IWC Scientific Committee, May 2003, Berlin (unpublished). 14pp. [Paper available from the Office of this Journal].

Rowntree, V.J., Payne, R. and Schell, D.M. 2001. Changing patterns of habitat use by southern right whales (*Eubalaena australis*) on their nursery ground at Península Valdés, Argentina, and in their long-range movements. *J. Cetacean Res. Manage.* (special issue) 2:133-43.

Samuels, A. and Bejder, L. 2004. Chronic interaction between humans and free-ranging bottlenose dolphins near Panama City Beach, Florida, USA. *J. Cetacean Res. Manage.* 6(1):69-78.

Scarpaci, C., Dayanthi, N. and Corkeron, P.J. 2003. Compliance with regulations by 'Swim-with-dolphins' operations in Port Phillip Bay, Victoria, Australia. *Environ. Manage.* 31(3):342-7.

Scarpaci, C., Nugegoda, D. and Corkeron, P.J. 2004. No detectable improvement in compliance to regulations by 'swim-with-dolphin' operators in Port Philip Bay, Victoria, Australia. *Tour. Mar. Environ.* 1:41-8.

Scheer, M., Hofmann, B. and Behr, I.P. 2004. Ethogram of selected behaviours initiated by free-ranging short-finned pilot whales (*Globicephala macrorhynchus*) and directed to human swimmers during open water encounters. *Anthropos* 17:244-58.

Simmonds, M.P. (ed.). 2004. *Whales and Dolphins of the World*. New Holland, London. 160pp.
Touhey, K.M., Merigo, C., Moore, M.J. and Patchett, K. 2003. Mass stranding prevention: the effectiveness of herding and acoustic deterrents. (Abstract presented to the 15th Biennial Conference on the Biology of Marine Mammals, Greensboro, NC, USA, 14-19 December 2003. [Available from: *http://www.marinemammalogy.org*])
Williams, R., Trites, A.W. and Bain, D.E. 2002. Behavioural responses of killer whales to whale-watching traffic: opportunistic observations and experimental approaches. *J. Zool., London.* 256:255-70.
Würsig, B., Wells, R.S. and Croll, D.A. 1984. Behaviour of summering gray whales. *In:* D.H. Thompson (ed.) *Feeding Ecology of Gray Whales in the Chirikov Basin, Summer 1982*. Unpublished report by LGL Alaska Research Associates, Inc., Anchorage, Alaska.

Appendix 1

AGENDA

1. Convenor's opening remarks and terms of reference
2. Election of Chair and appointment of rapporteurs
3. Adoption of agenda
4. Review of available documents
5. Report of intersessional Working Group
6. Biological impacts of whalewatching on whales
7. Review of published whalewatching guidelines and regulations
8. Development of the scientific foundation of whalewatching guidelines
9. Other topics
   - 9.1 Review of risk to cetaceans of high-speed whalewatching boats
   - 9.2 Review of potential impacts of 'swim-with' programmes on population of cetaceans
   - 9.3 Other
10. Work plan
11. Adoption of the report

Appendix 2

GLOSSARY OF WHALEWATCHING TERMS

E.C.M. Parsons, C.M. Fortuna, F. Ritter, N.A. Rose, M.P. Simmonds, M. Weinrich, R. Williams and S. Panigada

Whalewatching

Whalewatching involves the viewing of cetaceans in the wild, i.e. free-ranging animals (IWC, 1997, p.251). Whalewatching therefore does not include tourism activities where animals whose movements are deliberately restricted by humans and/or captive, either in sea pens, lagoons, pools or other form of enclosure. The term 'whale'-watching as currently used by the IWC whalewatching sub-committee equally refers to all cetacean species[1].

There are different types and varieties of whalewatching operations with differing characteristics that affect monitoring and regulation of their activities. To aid with the classification of these activities for the work of the whalewatching sub-committee (in particular the production of the international directory classifying and documenting whalewatching researchers) and for the benefit of scientists, managers and regulators, we have produced a glossary of whalewatching activities.

Although whalewatching activities, particularly those activities discussed by the whalewatching sub-committee, are typically boat-based, activities can also be land-based or aerial or involve swim-with-cetacean tourism (discussed below). Whalewatching also can be categorised as:

[1] i.e. Not just mysticete cetaceans, nor cetaceans with a 'whale' moniker such as killer and pilot whales.

(1) Commercial whalewatching

Whalewatching activities that involve paying customers, organisations or groups, which use viewing whales and dolphins as a means of obtaining funds. Commercial whalewatching can also be broken down further into directed or incidental whalewatching:

(i) directed whalewatching: a commercial tourism operation where operators specifically seek out areas of high cetacean abundance or known cetacean habitat;
(ii) incidental whalewatching: a commercial tourism operation whose primary focus may not be cetaceans (e.g. birdwatching, sealwatching or scenic tours), which does not specifically target known cetacean habitat, but the operation encounters cetaceans occasionally to frequently and mentions cetaceans in marketing materials at least briefly.

(2) Recreational whalewatching

Members of the public that encounter cetaceans and view them from personal recreational craft – i.e. activities that are not commercial companies or organisations. Such encounters can be opportunistic (i.e. chance encounters) or targeted (members of the public are actively seeing cetaceans). Regulation of recreational whalewatching may be more difficult than regulating commercial whalewatching because recreational whalewatchers are essentially private individuals, who may be less aware of issues regarding the impacts, who may be conducting activities 'on the spur of the moment', and whose activities are largely unknown to authorities and management bodies. Moreover, in some areas although there are regulatory mechanisms in place to control commercial whalewatching (e.g. permitting), there is no such mechanism to control recreational whalewatching.

Other characteristics of whalewatching activities

Duration of trips

Whalewatching operations can also be classified by the duration of excursions, for example:

(1) whalewatching trips: whalewatching excursions that are no more than a day long, typically based from a single home port. Many operations typically make multiple whalewatching trips during a day;
(2) whalewatching tours: multi-day whalewatching excursions that typically have passengers living on board a vessel. Multiple ports or even countries may be visited during the tour.

Power source

The type of propulsion that whalewatching vessels have also has implications for regulations and their impacts, particularly with respect to the noise produced by vessels or the risk of injury from propellers. Therefore whalewatching vessels can broadly be classified as:

(1) unpowered whalewatching craft (e.g. sailing boats, kayaks and balloons);
(2) powered whalewatching craft (e.g. outboard and inboard motor boats, cruise liners and motorised aircraft).

Intrusion

In addition there are two categories of whalewatching that could be considered intrusive. These may require special attention due to their potential impact on both cetaceans and humans:

(1) physically intrusive operations involve the tourists or tour operators/crew physically touching the cetaceans in any way except for accidental or incidental contact; and
(2) ecologically intrusive operations include activities that alter the natural history and behavioural ecology of cetaceans, such as introducing food to cetaceans.

Swim-with-cetacean tourism

This sub-category of whalewatching only encompasses activities that involve free-ranging animals 'in the wild' and not activities where the target cetaceans are either in a pool, pen or enclosure, or prevented from entering the open ocean by some form of barrier or physical and/or behavioural restraint. It also encompasses all cetaceans, whether mysticetes or odontocetes.

Swim-with-cetacean activities could in turn be termed passive (the in-water interactions rely on the cetaceans approaching the human tourists on their own accord) or active (some pursuit of cetaceans is involved or humans are actively placed in the water in the path of oncoming cetaceans).

Whale research tours/trips

Scientific surveys or research expeditions focussed on cetaceans, advertised as such, that are funded partially or wholly by financial payments by members of the public partaking in the survey/expedition. The activity is defined as a tour, or a trip, depending on its duration (as noted above)[2]. Ideally whale research tours/trips should entail:

(1) scientists are involved in providing advice on the design and analysis of the survey/expedition;
(2) the data collected on the survey/expedition are analysed and published (ideally as peer-reviewed journal articles or reports);
(3) the results of the survey/expedition are disseminated to the paying participants and appropriate authorities and stakeholders;
(4) the paying participants actively assist with in the collection of data and/or logistical aspects of the survey/expedition;
(5) appropriate and detailed training is given to the paying participants.

Whalewatching-aided research

It should be noted that 'whale research tours/trips' are different from whalewatching activities that assist with, or partake in, research. For example whalewatching operations that allow scientists to use the vessel as a 'platform of opportunity', tour operators that collect sightings, environmental or other data as part of their routine operations, or operations that otherwise assist in scientific research. Such scientific assistance should be eagerly encouraged of all whalewatching operations, particularly if such research is conducted with input and assistance from scientists, the data collected is quality controlled, and results and/or raw data are provided to scientists and managers for their utilisation.

Whale ecotourism

Although some whalewatching operations may qualify as whale ecotourism, this category of activities can encompass non-whalewatching whale-related tourism businesses such as visitor centres or museums dealing with cetaceans; as such, whale ecotourism is not a sub-category of whalewatching *per se*. Also, although the term 'whale' is used, this tourism activity encompasses all cetacean species.

Many whalewatching operations are incorrectly referred to as ecotourism activities. Although whalewatching can be referred to as marine wildlife-watching or nature-based tourism, the term ecotourism is generally accepted to refer to activities that have purposefully aimed to reduce their environmental impact and have some conservation component. Therefore whale ecotourism could be defined as a commercial operation that has taken major steps to:

(a) actively assist with the conservation of their resource (cetaceans), such as co-operating with research groups and other scientists and with research projects or allowing vessels to be used by scientists/research groups as platforms of opportunity;
(b) provide appropriate, accurate and detailed interpretative/educational materials or activities for their clientele about the cetaceans viewed and their associated habitat;

[2] There is a difference between *bona fide* whale research tours/trips and activities that advertise themselves as if they are conducting 'whale research tours/trips' but the operators are not conducting a dedicated surveys/research programme, and the activities have few, or none, of the characteristics listed in the above text. Such 'pseudo' whale research tours/trips may warrant special attention, particularly in regions where vessels conducting scientific research are granted increased and/or preferential access to cetaceans and their habitat.

(c) minimize their environmental impact (such as reducing emissions or disposing of refuse appropriately);
(d) adhere to whalewatching regulations or an appropriate set of guidelines, if no specific regulations are available for the area;
(e) provide some benefits to the local host community within which the company operates. Such benefits could include a policy of preferential employment of local people, selling local handicrafts, or supporting (either financially or in kind), local community-based conservation, education, cultural or social projects or activities, (for example financially or as in kind support for a voluntary marine rescue service or providing non-profit trips for local schools).

This glossary is provided to assist and clarify the work of the IWC whalewatching sub-committee and other researchers investigating whalewatching activities and whalewatching managers. These terms are working definitions and should not be considered as absolute categorisations of activity.

REFERENCE

International Whaling Commission. 1997. Report of the Scientific Committee, Annex Q. Report of the whalewatching working group. *Rep. int. Whal. Commn* 47:250-6.