Annex M

Report of the Sub-Committee on Whalewatching

Members: Kato (Chair), An, Bando, Berggren, Bjørge, BlackLayne, Borsani, Bortolotto, Canese, Carlson, Childerhouse, Clark,C., Crespo, Deimer, Dinter, Engel, Fortuna, Fossi, Funahashi, Gales, Groch, Iñíguez, JeanBenoit, Kim, Kishiro, Last, Lauriano, Lawrence, Lima, Magloire, Marsili,, Mattila,, Nakatsuka, Nishiwaki, Ohsumi, Øien, Oosthuizen, Palazzo, Panigada, Parsons, Pavan, Payne, Pelusi, Perry, Picciulin, Pike, Rambally, Reijnders, Rennie, Ridoux, Ritter, Robbins, Rojas-Bracho, Rose, Rosenbaum, Rowles, Sadler, Senn, Sequeira, Simmonds, M., Simmonds, Sohn, Stachowitsch, Urbán, Urquiola, Wada, Walters, Wang, Wells, Williams, Wilson, Yoshida.

1. OPENING REMARKS AND TERMS OF REFERENCE

Kato welcomed the participants and noted the priority items identified by the Scientific Committee: (1) DRS (continued intersessional work on field testing and development, review data forms used on whalewatching boats throughout the world, and explore the role of behavioural studies in whalewatching research); (2) Whalewatching Management Workshop (receive and consider the relevant aspects of the report and designate an intersessional correspondence group to provide scientific advise to the Workshop); (3) review of whalewatch guidelines and regulations; (4) review of risk to cetaceans from high-speed whalewatch boats, e.g. from collisions; and (5) continue relevant assessment of swim-with-whale programmes.

2. ELECTION OF CHAIR AND RAPPORTEURS

Kato was elected chair and appointed Carlson as rapporteur assisted by Rose.

3. ADOPTION OF AGENDA

The adopted agenda is given in Appendix 1.

4. REVIEW OF AVAILABLE DOCUMENTS AND INFORMATION

The documents available to the sub-committee were identified as: SC/56/WW1-12; Constantine et. al. (2004); Garrod and Fennell (2004); and Progress Reports from the United Kingdom, New Zealand, Spain, Iceland, Brazil and Australia.

It was noted that at least six national Progress Reports contained information on whalewatching and that only the UK and Australia listed whalewatching as a separate item.

5. WHALEWATCHING DATA COLLECTION

5.1 Report of the intersessional correspondence group

The intersessional correspondence group provided comments and advice used to further develop the DRS discussed in 5.2.

5.2 Compendium of data forms used on whalewatching platforms

SC/56/WW2 introduced a prototype web-based Data Recording System (DRS), demonstrated to the sub-committee on a website. The DRS has now been developed to include the following new features: ethograms for a series of species to aid the capture of accurate behavioural data; and draft guidelines for taking good quality photographs suitable for photo-identification comparisons. The prototype DRS can be found at www.wdcs.org/drs. Further assistance was requested from sub-committee members particularly with respect to ethograms and advice on photography. Following further development, it is intended that the DRS will be made fully public in the near future and data generated will be used to further ground-truth the system.

The DRS was welcomed by several members as an excellent advance in the pursuit of utilizing whalewatching vessels as platforms of opportunity to collect useful data. Discussion followed on the goal of the forms, the use of the website, the submission of data and data quality control. It was noted that one goal of the form was to

facilitate the collection of useful data by operators and others through standardized forms of varying levels and that the forms would be of particular value in encouraging non-scientists to collect data in a systematic way. In addition, collecting data over time in a uniform manner increases the utility of the data for answering unanticipated questions in further analyses. Some members suggested that the website should have a place for students and whalewatchers to enter data and photographs with possible links to educational database websites. It was agreed that there was a concern about quality control of data, as it is important to managers and researchers and that it should be taken into consideration with the further development of the DRS. It was noted that this is an area where connections to local scientists are critical.

The sub-committee congratulated the authors on achieving their intended goals and agreed that the development of the DRS should continue.

5.3 Other

SC/56/WW1 summarised the contribution of whalewatching platforms in the Northern coast of Bahia State, Brazil for collection of scientific data on humpback whales (*Megaptera novaeangliae)*. In recent years, humpback whales have been reoccupying the Northern Coast of Bahia State as a consequence of the population increase on Abrolhos Bank. Since 2001, scientific data have been collected onboard whalewatching vessels in Praia do Forte Beach by Instituto Baleia Jubarte (IBJ) staff. During 3 years of data collection, a total of 314 humpback whales, including 30 calves, were sighted. Behavioral and distributional data related to the species were recorded and 42 individual whales were photographed. The presence of mothers with newborn calves may indicate that this area is used as a calving ground. While whalewatching on humpback whales began in 1988 at Abrolhos Bank, it is still developing due to a lack of infrastructure to support tourism and to the distance of the whales from shore.

By contrast, whales can be sighted from Praia do Forte beach, a major ecotourism site in Brazil. Due to the near shore proximity of whales and the well-developed infrastructure for tourism in the area, IBJ proposed to the Bahia State Government the creation of a Marine Protected Area. In June 2003 the Government established the North Coast Shelf Environmental Protection Area. The authors consider the development of whalewatching in the Northern Coast of Bahia State as a sustainable use of cetacean resources and a valuable tool for scientific research. They further acknowledge the need for continued monitoring of whalewatching activities to detect and evaluate possible disturbances to the whales and to assist in the management of the MPA.

The group discussed whether data collected aboard the whalewatching vessel reflected the true distribution of the population and the reoccupation of the area or if it was biased by the limited geographical range and expansion of the whalewatch industry. The author noted that a complementary research survey was conducted during the whalewatching season (SC/56/SH6) and that whalewatching in the area began in 2001, while the first survey was conducted in 2000. Information on whales reoccupying the area was first received from local residents and fishermen and there was little to no information 5 to 10 years ago. It was suggested that the reoccupation could be the result of the increasing population of whales on Abrolhos Bank.

During its 2002 and 2003 meeting, the sub-committee on Whalewatching requested a listing of scientific research activities that involve whalewatching, both as their primary focus and /or research that utilizes whalewatching boats as platforms of opportunity. SC/56/WW8 collated data collected from websites and requests to MARMAM in a worldwide directory that lists information on 80 projects. The projects are organized by type of study and platform. Although incomplete, the directory shows the considerable, wide range of scientific research related to whalewatching.

One member noted that research on evaluating the effect of whalewatching on whales might be the most important contribution to future discussions and suggested that the authors highlight those researchers conducting impact studies who are not represented in the Committee. It was agreed that a list of key researchers be generated and that they be asked to submit papers or be considered to attend the Scientific Committee as members of the sub-committee.

The group then discussed ways to proceed with the Directory. One member noted that the Directory considered only biological research, and that it would have been useful to generate a more comprehensive Directory of all researchers including research on the economic viability of whalewatching. Other members of the group stated that although reports on socio-economic aspects have been submitted to the sub-committee, it was outside the competence of the Scientific Committee and was a matter for the Commission. A small working group, comprised of Iniguez (chair), Parsons, Urquiola, Urban and Gales, was constituted to develop a format for the Directory and suggested a working procedure. The Sub-committee reviewed their report and **recommended** that a copy of the log scheme (Appendix 2) be provided to the Secretariat as a PDF file for inclusion on the website of the IWC. The PDF file will be publicised following the same process used for the SOCER (Annex J). The information collected will be analysed by members of the sub-committee and presented next year.

It was noted that during IWC55, the Scientific Committee **recommended** that "Contracting Governments, when possible, report and clearly identify the data obtained from whalewatching vessels in their Progress Reports under section 2.1.2 (Opportunistic, Platforms of Opportunity). In addition, clarification of whether data are collected by scientist(s) on whalewatching platforms or whalewatching operators/crew and methodology would be useful". It was noted that relatively little whalewatching research is represented in national Progress Reports and some countries had recorded none, despite known activities conducted in those countries. One member stated that it was Japan's understanding that the content of the Progress Reports was an official report to the IWC and that discussions in the sub-committee should not preempt discussion in the full Scientific Committee. Another member noted that the submission and content of the Progress Report was respective to a country's national policy and the preceding language was not compulsory. After discussion, the sub-committee **agreed** to request that appropriate wording for the listing of this information be added to the IWC Progress Report template.

6. REVIEW OF REPORT AND RECOMMENDATIONS FROM THE WHALEWATCHING MANAGEMENT WORKSHOP IN SOUTH AFRICA

Oosthuizen introduced SC/56/WW12, the Report of the Workshop on the Science for Sustainable Whalewatching. He thanked the British High Commission in South Africa and the United Kingdom Department of Foreign Affairs for funding the Workshop and the participants who funded their own attendance

The IWC-endorsed Workshop on the Science for Sustainable Whalewatching, held in Cape Town, 6-9 March 2004, reviewed available scientific and management tools for regulating whalewatching operations. Further, the Workshop developed a concept for managing whalewatching based on the widely adopted precautionary approach (Principle 15 of the UNCED 1992 Declaration, and the FAO Code of Conduct). This concept includes a clear definition of management objectives with Target and Limit Reference Points and a Precautionary Approach Reference Point. In order to evaluate status in relation to predefined reference points, the Workshop discussed a set of critical response parameters to link whalewatching operations to impacts on cetaceans and appropriate techniques to monitor these parameters. This management concept has to be adapted and adopted on a case-by-case basis, taking into account domestic legislation, policy, guidelines and socio-economic considerations. However, the benefits of a common management concept include the possibility of adopting comparative objectives and applying similar monitoring techniques. New techniques and studies for quantitative assessment of the impacts of whalewatching operations were discussed (Bain et al. (in review); Bejder et al. 1999; Lusseau 2003; Lusseau and Higham 2004; Williams et al. 2002a, 2002b, 2004).

The report of the Workshop is summarised in Appendix 3. The full report will be made available through a web link on the IWC website.

In discussions, the Sub-committee on Whalewatching considered the report and recommendations from the Cape Town Workshop on the Science for Sustainable Whalewatching and **agreed** to forward the following recommendations to the Scientific Committee for consideration.

(1) The value of experimental studies was noted and it was **recommended** that such studies be employed to measure the impacts of whalewatching whenever possible.

(2) The Cape Town Workshop reviewed new approaches and quantitative studies of relevance to the Scientific Committee. It was **recommended** that the Sub-committee further explore and develop these new approaches and quantitative studies as highlighted in the Cape Town Workshop report (available through a web link on the IWC website).

(3) The Cape Town Workshop started to develop a framework for the management of whalewatching similar in concept to those codified in the FAO Code of Conduct for fisheries, in which three reference points were suggested: "Target Reference Points (TRP)", "Limit Reference Points (LRP) ", and the "Precautionary Reference Point (PRP)". It was **recommended** that the Scientific Committee continue this approach when developing a framework for monitoring whalewatching.

(4) Monitoring population trends in free-ranging cetaceans and determining that they are impacted by whalewatching has proved to be very difficult. It was **recommended** that until more is known about the impacts of whalewatching that it is carried out according to the Precautionary Principle so as to minimise the disruption of life history processes both of individuals and populations.

(5) Scientists should inform managers on a case-by-case basis about relevant research, and the appropriate critical parameters needed to monitor population status. Efforts should be made to assess the possibly different impacts of whalewatching on baleen whales that are migrating, on their feeding grounds, on their mating and calving grounds, or are residents. Whalewatching may also impact coastal and pelagic odontocetes in a variety of

ways. It was **recommended** that a variety of case studies be examined so as to promote broad conclusions about assessing impacts of whalewatching on different taxonomic groups at a variety of life history stages.

(6) It was **recommended** that where possible, whalewatching guidelines should be based on criteria that are simple, practical and objectively measurable under field conditions. These criteria should be developed and tested experimentally and developed in response to scientific results.

(7) The Cape Town Workshop acknowledged the IWC 1997 General Principles for the Development of Regulatory Frameworks for Whalewatching noting that they were still applicable and suggested additional principles for consideration as detailed in Appendix 3. It was **recommended** that the Principles identified by the Workshop be included in the IWC General Principles for the Development of Regulatory Frameworks for Whalewatching and displayed on the IWC website.

The sub-committee expressed thanks to the conveners and participants of the Workshop and recognised its valuable contribution to their work. They also recognized the success of the Workshop in bringing together managers, operators and scientists willing to speak a common language.

7. NATIONAL WHALEWATCHING GUIDELINES AND REGULATIONS

7.1 National guidelines and regulations for whalewatching

SC/56/WW4 described known whalewatching and whalewatching-like activities in Italian waters. It suggests ideas for the implementation of comprehensive, national regulations. Italian whalewatching operations were characterized through information obtained on the Internet and personal sources. Three types of operations were found: commercial; ecotourism offering whalewatching; and research whalewatching offered by groups funding their research through eco-volunteers. Despite the great diversity of cetaceans in Italian waters, only 4 commercial operations were found. In addition, the geographic extent of the operations was limited to the Ligurian sea. Greater numbers of ecotourism and research whalewatching operations exist, as well as a growing number of small organizations advertising whalewatching-like initiatives. In order to facilitate the process of regulating whalewatching activities, the authors present a collation of international and national guidelines, agreements and law, relevant to Italy, that might be used as the basis for national regulation and that could promote whalewatching in Italy as a sustainable use of cetaceans by encouraging the development of community-based operations.

It was noted that to date there are no regulations for whalewatching in Italy, but a national law, Pesca Tourismo, allows for fisherman to host tourists on their boats without superceding fishing activities. Although this law has not yet been applied to whalewatching, its regulations could help policymakers in implementing whalewatching guidelines.

The importance of the newly developed ACCOBAMS guidelines for whalewatching was discussed. These form a framework from which local, national and regional guidelines can be defined and detailed. The author of SC/56/WW4 noted that the guidelines would be useful to Italy as they are easily translatable. The guidelines include provisions for research whale watching and it was noted that they would be tailored and further developed in light of ongoing research in the region. Within the framework of a recently funded LIFE-Natura Project, ICRAM will be working with relevant Italian authorities to adopt and implement the most appropriate regulations. The validity of developing whalewatching guidelines that did not take into account the different requirements for commercial, opportunistic and research whalewatching operations was raised. One member replied that there is a great variability in national regulations for research programmes and in some countries permits for research are required.

The various types and categories of whalewatching activities were noted. After discussion it was **agree** that an Intersessional Working Group be formed to discuss definitions of whalewatching (Parsons (chair), Fortuna, Groch, Oosthuizen, Iniguez, Palazzo, Ritter).

SC/56/WW5 reviewed legislation, policies and guidelines relevant to the protection of whales, with regards to whalewatching, in Australian waters. To date, there are thirty legislative or policy documents concerned with the protection of cetaceans in Australian and Australian state and territory waters, of which eleven are acts. Australian whalewatching management is progressive as there is a framework for state (up to 3nm offshore) and national (3-200nm offshore) levels of management. Furthermore, the fact that the Commonwealth and most states have implemented regulations rather than guidelines only is significant because regulations are more enforceable than guidelines and require more work to implement. Current level management can be potentially confusing because of the number of legislations and cross-jurisdictions.

Recent studies that address the reduction of whalewatching impacts on cetaceans were summarised in SC/56/WW6. Lusseau (2003) discussed the impacts of whalewatching on bottlenose dolphins in Doubtful

Sound, New Zealand. Studies have indicated a decrease in resting behaviour as a result of disturbance, and the establishment of a multilevel sanctuary area based on critical habitat use and behaviour was proposed in response (Lusseau and Hingham 2004).

Valentine *et al.* (2004) reported that tourists on dwarf minke whalewatching tours in Australia typically had low expectations of the presence of whales and type of encounters. The authors noted that the cetacean-based tourism industry should maintain this realistic level of expectation and continually reiterate that all encounters should be under the whale's control.

Kelly *et al.* (2004) published results of an investigation on marine wildlife disturbance (including cetaceans) in Southwest England. One of the main aspects of the study was the collation of reported incidents of marine wildlife disturbance or harassment; forty-four in ten years. Officials responsible for wildlife protection and management noted the lack of reporting of harassment incidents, a lack of awareness of the legislation, difficulty in gathering evidence of disturbance/harassment and a lack of evidential data and diversity of opinions as to what constitutes harassment.

Berrow (2003a) discussed management of bottlenose dolphin (*T. truncatus*) watching in the Shannon Estuary, a Special Area of Conservation in western Ireland. In this area, tour operators are obliged to adhere to a code of conduct and those agreeing to the code receive several tangible benefits (e.g. marketing, promotion). Berrow (2003b) presented a framework to ensure the sustainability of whale-watching activities. This emphasised, amoung other issues, long-term research, stakeholder involvement and monitoring impacts.

It was noted that much research on whalewatching had been published over the past year of direct relevance to the work of the sub-committee. The sub-committee **agreed** that an annual summary report or digest of published whalewatching research would be useful and asked Parsons to collate the material for presentation to the sub-committee next year.

SC/56/WW10 reviewed and analyzed the variation in whalewatching regulations and guidelines from 32 countries and territories (including 13 special areas of interest), organizations, operator associations and the IWC. The analyses (shown in pie charts) examine and compare components of guidelines and regulations including: minimum permitting, training and reporting; vessel approach and departure; distance approach of vessels to whales; considerations for mother/calf pairs; direction of approach; maximum time spent with whales; maximum number of vessels near whales; aircraft codes; vessel operation; species-specific codes; vessel speed and engine control; and human/whale interaction. WW10 reviews general considerations for the establishment of guidelines and regulations and discusses the advantages and disadvantages of binding and non-binding approaches to the management of whalewatching. The updated compendium detailing whalewatching regulations and guidelines from around the world (Carlson 2004) is posted on the IWC website.

The results of a manifest content analysis of 58 whalewatching codes from around the world were presented in Garrod and Fennell 2004. The results of the analyses were organized into 4 sections: general information (e.g. region; developed by); approach characteristics (e.g. aircraft approach, boat approach distance); interactions with cetaceans (e.g. swimming, feeding); and management orientation (e.g. permitting, control of pollution). The analysis revealed considerable variation amoung the guidelines as well as in the provisions they contain. They noted that most codes of conduct and regulations are from North (29.3%) or South (24.1%) America or Europe (24.1%). There was a notable lack of regulations from regions such as Africa and Asia. Statistical analyses on the types of regulations in these regions showed that European guidelines were more likely to be voluntary and North American guidelines mandatory**.** Stakeholder participation in the formation of guidelines was noted.

7.2 Review of their effectiveness

SC/56/WW3 is an updated review of whalewatching management in the United Kingdom (UK) presented at the Cape Town meeting. The authors note that whalewatching is managed by a combination of regulatory measures and voluntary approaches (i.e. codes of conduct). Recent changes have been made to UK law to make it better able to address cetacean disturbance, including most recently, the requirement in Scottish law for a national marine wildlife watching code to govern all boat interactions with marine wildlife. The authors suggest that this code might require operators to follow particular rules and that it should also facilitate training of operators and a good educational experience. WW3 also draws attention to important reviews in literature including Corkeron (2004), Kelly et. al. (2004) and Garrod and Fennell (2003).

Noting that Scotland now has a requirement in law for a code of marine wildlife watching, the importance of management involving stakeholders in the development of regulation to facilitate compliance was highlighted. This is of particular importance in remote areas where enforcement is particularly problematic.

The impact of dolphin-watching tour boats on bottlenose dolphins (T. truncatus)), in the Bay of Islands, New Zealand, is presented in Constantine et al. (2004). Boat-based focal follows of schools of bottlenose dolphins

were conducted to determine the effects of boats on dolphin behavior. A CATMOD analysis showed that dolphin behavior differed by the number of boats present; in particular, resting behaviour decreased as boat number increased. Dolphins rested less and engaged in more milling behaviour in the presence of permitted dolphin-watching boats compared to non-permitted boats. An increase from 49 to 70 permitted trips per week and a change in their departure times resulted in a further decrease in resting behaviour. Currently, the effects of boats, in particular permitted boats, on dolphin resting behaviour while they are in the Bay of Islands, are substantial. Based on their findings, the authors suggest that current legislation in New Zealand is not affording protection from disturbance to this isolated population.

The sub-committee **agreed** that this was an exemplary study and that quantitative research on vessel impacts should be encouraged and that it would be of value to have the researchers present such findings at future meetings.

SC/56/WW6 presented information on several studies addressing compliance with whalewatching regulations. Scarpaci et al. (2003) monitored regulation compliance of "swim-with" dolphin operators in Victoria (Australia) with four specific regulations. None of the operators adhered to the regulations during the monitoring period. Compliance with regulations was lowest involving time limits for exposure to dolphins (61-62% non-compliance). The number of illegal approaches of dolphin tour boats to animals decreased in the summer months despite increased tourist numbers, probably due to the presence of enforcement officers.

Whitt (2003) monitored the compliance of five bottlenose dolphin-watching operators to dolphin-watching regulations. Although all of the observed tour operators limited their encounters with dolphins to the regulatory limit of 30 min, only 34-67% of the tour boats' manoeuvring was appropriate.

Corbelli and Lien (2003) investigated various aspects of whalewatching in Newfoundland, including the introduction, use of, and adherence to, a voluntary whalewatching code of conduct. Eighty-one percent of whalewatching operators stated that the code was valuable for their business. The researchers monitored 90 interactions between whale-watching vessels and whales, only observing 12 infractions. Over one third of the tourists expressed willingness to report infractions of guidelines; useful for the monitoring of compliance. However, one quarter of the tourists believed an infraction had occurred when it did not and only one third of the tourists noticed an infraction when it occurred, indicating the need for education. When the tourists taking the trips were questioned about possible violations of the code of conduct, 25% believed that a violation had occurred when it had not; conversely, only 29% of passengers recognised code of conduct violations when they actually did occur.

SC/56/WW9 examined compliance with voluntary speed guidelines by commercial whalewatching vessels around Stellwagen Bank National Marine Sanctuary, Massachusetts, USA. To measure compliance with speed limits, inconspicuous observers were placed onboard 35 commercial whalewatching trips that occurred in and around the Sanctuary. Observations were made from August to October 2003. Vessel speed and position were measured using a WAAS-enabled GPS receiver with an accuracy of approximately 3 meters. Data were collected at 5 seconds intervals from the time of departure from port until the vessel's return. Military-grade binoculars with an internal laser rangefinder and digital compass were used to record the range and bearing to sighted whales, allowing their location to be calculated. Both data sources were processed and mapped using an ARC View GIS. Compliance was evaluated by creating guideline-specific speed zone buffers around the sighted whale and overlaying them with vessel speed and track data. Speeds in excess of those prescribed by the guidelines were considered non-compliant. Results indicated that whalewatching vessels often ignored speed zone guidelines and that the degree of non-compliance increased as the distance to the whale increased.

One member stated that compliance closer to whales might be a result of slowing down to view whales rather than a result of following the guidelines. It was noted that, to encourage compliance, the results of the study were posted on the Sanctuary website. The problem of enforcement was discussed. One member stated that the commercial whalewatching industry was difficult to regulate. Another member responded that there is a general difficulty in regulating ocean-going activities. The sub-committee **agreed** that discussions on the issue of compliance are making good progress. Several members welcomed this as an innovative approach to measure compliance to whalewatching guidelines and regulations.

8. OTHER

8.1 Review of risks to cetaceans from whalewatching boats

8.1.1 High-speed vessels

There were no reports submitted to the sub-committee on high-speed vessels. However, the following definition of high-speed vessel was **agreed**: whalewatching activities with vessels traveling equal to or greater than 13 knots.

8.1.2 Other

SC/56/WW7 evaluated the potential effects of vessel traffic on the Commerson's dolphin (Cephalohrynchus commersonii) population of Bahia San Julian, Argentina. During January-February 2000 and 2001, land-based and boat-based observations were made on group cohesion, group size and vessel-dolphin distance under different intensities and vessel traffic types. The absence of vessels in the bay was considered as the control. No significant differences were found in the variables analysed, including the number of vessels, the power of the engines or the type of activity performed by the vessel. The levels of vessel activity in this area do not seem to have affected the analysed behaviour variables of the Commerson's dolphin population in the Bahia San Julian region of Argentina. The author noted that in this study, dispersion was determined by measuring inter-animal spacing in units of dolphin body-lengths (1dl=1.5m).

SC/56/WW11 presented a summary of research on the potential impacts of whalewatching on the reproductive behaviour of male humpback whales (Megaptera novaeangliae) in the Abrolhos National Marine Park, Brazil. Four semi-autonomous recording devices, referred to as pop-ups, were deployed on the ocean floor in an array to sample from 21 July to 18 August 2003. This technique allows one to locate and track all singers and vessels within an area of approximately 17km^2. Preliminary analysis of five days chosen at random indicate there is variation in the number of located males vocally active throughout the day. A decrease was also found in detectable singing activity in periods of intense boat traffic. The results suggest that a potential cetacean communication breakdown may occur from the effect of boat-generated acoustic events associated with whalewatching activity.

It was noted that little information exists on the impacts of vessels on large baleen whales or the link between the cessation of vocal behaviour and vessel activity. The sub-committee welcomed this work, **agreed** that use of acoustic techniques to assess impacts on large baleen whales in breeding areas was a progressive step forward and encouraged its continuation in Brazil and the initiation of similar projects in other large baleen whale breeding areas (e.g. Dominican Republic or Northern Philippines).

8.2 Review of potential impacts of "swim-with" programmes on population of cetaceans

It was noted that an update of SC/55/WW4, a review of commercial swim-with-whale programmes, would be prepared for SC57.

9. WORK PLAN

The work plan is prioritized two major items as below:

(1) Assessing the biological impacts of whalewatching on whales.
(2) Development of the scientific foundation of whalewatching guidelines.

In addition, following items are identified as work plan in the next meeting:

(1) Review of whalewatching guidelines and regulations
(2) Reports of the Intersessional Working Groups (Definitions of type and categories of whalewatching; Further development of precautionary approaches as a science-based framework for the management of whalewatching- in addition this group will consider methods for the assessing the effects of whalewatching).
(3) Review of risks to cetaceans from whalewatching vessels (high-speed and others).

The sub-committee discussed the work plan and prioritized as listed. They **agreed** that an Intersessional Working group be formed to further develop precautionary approaches to the management of whale watching. In addition, the group will consider methods to assess the effects of whalewatching (item 6, recommendation 3). Oosthuizen agreed to chair the Group and Childerhouse, Palazzo, M. Simmonds, Urban, Williams and Wilson to participate.

10. ADOPTION OF REPORT

The report was adopted at 17:00 on 6 July 2004. The sub-committee expressed its thanks to Kato for chairing the meeting and to Carlson for her work as rapporteur.

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Appendix 1

AGENDA

1. Opening remarks and terms of reference
2. Election of chair and rapporteurs
3. Adoption of agenda
4. Review of available documents and information
5. Whalewatching data collection
    - 5.1 report of intersessional correspondence group
    - 5.2 compendium of data forms used on whalewatchng platforms
    - 5.3 others
6. Review of report and recommendations from the whalewatching management workshop in south africa
7. National whalewtching guidelines and regulations
    - 7.1 National guidelines and regulations for whalewatching
    - 7.2 Review of their effectiveness
8. Other
    - 8.1 review of risks to cetaceans from whalewatching boats
        - 8.1.1 high-speed vessels
        - 8.1.2 other
    - 8.2 review of potential impacts of "swim-with" programmes on population of cetaceans
9. Work plan
10. Adoption of report

Appendix 2

WORLDWIDE DIRECTORY OF WHALE WATCHING RESEARCH

Name:

Affiliation:

Address:

Phone: Fax:

E.mail: Web site:

Please, choice and check one option

□ Research using whale watching vessels as platforms of opportunity

□ Research on other aspects whale watching operations.

□ Both of the above

Type of studies conducted

□ Distribution

□ Abundance

□ Habitat

□ Mortality

□ Genetics

□ Diet

□ Reproduction

□ Acoustics

□ Social structure

□ Education / interpretation/provision

□ Behaviour

□ Boat interaction

□ Management

□ Telemetry/ tagging

□ Environment issues related to cetaceans

□ Conservation

□ Ecology

□ Socioeconomic

□ Whale watcher (tourist) characteristics

□ Other

Location:

Species involved (scientific name):

Time frame:

Appendix 3

SUMMARY OF THE REPORT OF THE WORKSHOP ON THE SCIENCE FOR SUSTAINABLE WHALEWATCHING, CAPE TOWN, SOUTH AFRICA, 6-9 MARCH 2004

The terms of reference for the workshop were: "(i) to review the scientific basis for management of whalewatching; and (ii) to discuss future management development and implementation frameworks to ensure both the minimisation of negative impacts and optimal sustainable tourism."

A number of options, used individually or in combination, are available for managing the effects of whale watching on cetaceans. Regulations and permit conditions provide the greatest level of management certainty and control, although voluntary codes of conduct can be effective where there is good industry cooperation. Education is an important tool in almost all circumstances, especially where recreational marine mammal watching occurs.

Basic biological information on cetacean populations is needed in order to assess impact of whalewatching on individuals or stocks. Some small populations may be so critically endangered that no whalewatching would be advisable. A common theme in the discussions about management and science is that both need to be species- and location-specific. The scientific recommendations one would make to managers would vary widely depending on the taxonomic group and location. It was agreed that scientists should inform managers on a case-by-case basis about relevant research, and the appropriate critical parameters to monitor population status. However, in view of the possible differing levels of impact, it was felt that there is a need for general recommendations about, for example, assessing impact of whalewatching on baleen whales on migration routes, feeding grounds and mating and calving grounds, resident baleen whales, coastal odontocetes, and pelagic odontocetes. Thus, it was agreed that examining a variety of case studies would allow us to reach some broad conclusions about assessing impact of whalewatching on different taxonomic groups at a variety of life-history stages.

The response variables that one might measure to assess impact of whalewatching on cetaceans would also differ among taxonomic groups and life-history stages. Workshop participants, working from a list developed by the Whalewatching Subcommittee identified several of these candidate response variables, but noted that these variables varied widely in their importance, their feasibility to be measured, the timeframe required to supply the needed information, and the ability for scientists to attribute the critical response to the effects of whalewatching. The workshop report provided a consensus opinion on critical response variables to be measured and the time frames in which they might be measurable. A list of some suitable methods to conduct such studies was also provided. Specific case studies were considered in detail for the following categories: baleen whales on migration routes; baleen whales on feeding grounds; baleen whales on breeding grounds; non-migratory baleen whales; odontocetes coastal closed population; odontocetes coastal open population; odontocetes oceanic and river dolphins.

The workshop agreed that scientific management of whalewatching is an iterative process, whereby rules are adaptive. It was agreed that whalewatching should be managed such that whalewatching does not interfere significantly with the survival or ecological functioning of individuals, populations or species; and that therefore in the short-term, whalewatching should not result in unacceptable adverse change in population dynamics such as reproduction or mortality or impede normal patterns of habitat use or activity, including feeding, resting and reproduction. The workshop participants agreed that managers concerned with impact on the level of populations should be encouraged to minimise impact on individual cetaceans. Preventing disruption of critical life-history processes at the individual level is one way to prevent population-level impacts.

The workshop discussed a possible general management approach that has obtained wide acceptance within environmental and marine resource management, focussing on the Principle 15 of the UNCED 1992 – The Rio Declaration:

> *"In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."*

This principle has been considered and applied in a number of international and regional instruments, as well as in national legislation related both to fisheries and prevention of marine environmental degradation. The Workshop developed a management framework similar in concept to those codified in the FAO Code of Conduct for fisheries. Three reference points were suggested:

Target Reference Point (TRP): This reference point describes the ideal situation; that is, no impact on the natural or pristine situation. The TRP could include, *inter alia*, recovery of the population to pre-exploitation level; no anthropogenic mortality; no increase in the energetic demand of individuals; no changes in the behavioural budget of animals; no displacement from core areas; no reduction in the energy acquisition of individuals.

Limit Reference Point (LRP): This reference point describes the limit when the impact of a whale watching enterprise enters into a situation that is not acceptable, for example, a point above potential biological removal. The LRP should be developed with description of urgent management actions, and legal instruments to implement these, that should be triggered immediately when the limit reference point is exceeded.

Precautionary Reference Point (PRP): All human activity that takes place within an ecosystem has some impact on the system or the environment. The PRP describes how far down the scale from the TRP towards the LRP is regarded as an acceptable situation. This reference point includes an aspect of political acceptance of a risk for entering into an unacceptable situation, and the degree of risk that is regarded acceptable will probably vary according to socio-economic situation and the political situation associated with the respective whale watching case. The PRP should incorporate due consideration of scientific uncertainty (including uncertainty regarding other anthropogenic influences), and should not prevent or delay management decisions in the face of scientific uncertainty.

All reference points need to account for process and measurement uncertainty in our information on the systems under consideration. This means that the PRP and LRP may need to be separated sufficiently that one does not instantaneously (or almost instantaneously) lead to the other. When no data are available, the PRP may need to be set close to or at the TRP.

It was recommended that further consideration should be given to developing this approach. Further, it was agreed that scientists should participate in developing reference points by providing advice on:

(1) definition of the reference points;

(2) critical parameters to measure; and

(3) techniques to monitor where a system is on the scale between the Target Reference Point and the Limit Reference Point.

In situations where data do not exist, this scheme may be difficult to implement. Therefore, it was noted that there is a need for pre-whalewatching assessment of target cetacean populations.

An example of the application of this framework was provided investigating the effect of dolphin watching on bottlenose dolphins in Doubtful Sound, New Zealand. In this case the Reference Point that is being considered is the proportion of time that dolphins have boats with them. The Target Reference Point (TRP) could be set at 0% (e.g. boats do not spend any time with dolphins). Studies have demonstrated that the amount of time dolphins spent with boats affected their behavioural budget and resting was the determined to be the most sensitive behavioural state to interactions with boats (Lusseau 2004). Lusseau (2004) showed that when dolphins spend 35% or more of their time interacting with boats, their overall time spent resting was significantly reduced. Based on this scientific study, the Limit Reference Point (LRP) would be set at 35% (e.g., proportion of time that dolphins have boats around them). Therefore the Precautionary Reference Point (PRP) would be set between the TRP of 0% and the LRP of 35%. The setting of this value would be made after including factors such as the degree of risk that is considered acceptable, socioeconomic issues, and a consideration of scientific uncertainty.

The Workshop developed a list of critical response variables and a set of categories of cetaceans. The critical response variables were then ranked (0,1,2,3) relative to how useful they were likely to be for answering questions relating to whalewatching management (Desirable, Important and Critical). Further iteration resulted in decisions regarding which techniques were the most likely to provide data on each variable for each cetacean group. This final iteration took account of technical feasibility, statistical power and timeframes likely to be useful for management.

It was agreed that experiments (rather than opportunistic surveys) are the preferred method for measuring impact of whalewatching on cetaceans. It was further agreed that studies on known individual animals are the preferred method for obtaining unbiased records of behaviour. Focal-animal studies provide the basis for quantitative measures of, *inter alia*, sociality, movements, exposure to stimuli, activity and energy budgets – all of which provide the bases for direct comparisons between disturbance conditions. Data obtained with a focus on the individual can be used to determine which animals, and what proportion of a local community, are more likely to interact with, be detrimentally affected by, or avoid human activity. Conducted over time, such studies provide valuable information about the short-term, seasonal, and long-term impacts of cetacean-focused tourism on the

lives of individual cetaceans, on animals of different sex, age class, activity state, or reproductive condition, and on cetacean communities.

Effective impact studies require a multi-faceted approach, including one or more of the following research design features: (1) collecting data from multiple research platforms, (2) utilising appropriate behavioural sampling techniques, (3) monitoring several response measures simultaneously, (4) supplementing opportunistic observations with controlled experiments, (5) analysing existing historical data, and (6) taking advantage of innovative technologies. Controlled experiments include, but are not limited to, spatial and temporal controls (which requires time/area closures) and appropriate replication.

There are multiple ways in which research can inform management of whalewatching. Among these are to assess the nature of the human activity around cetaceans as well as ways to minimise its impacts. Another aspect is to quantify the cost of human activity on the animals themselves. The impact of interactions depends on their characteristics (*i.e.*, their duration, the behaviour of the boat, the type of vessel etc.) and it is important to define which of these characteristics are the most significant in defining the intrusiveness of an interaction. The workshop then identified and described the characteristics of these interactions in its report.

The workshop then discussed how to infer the cost of whalewatching to cetaceans. Several short-term responses by cetaceans can be quantified in a way that permits assessment of energetic costs. Both the cost of travel and basal metabolic rates can be estimated for some species. However, advances in understanding the physiology of cetaceans (such as basal metabolic rate and energetic states) will help us relate behavioural responses to energetic costs. Horizontal avoidance is a typical response to boat interactions. Some cetaceans try to evade boats by adopting less predictable paths in the presence of boats than those observed (from shore, for example) prior to the boat's arrival. One can quantify how much more individuals have to travel to go from A to B when they are with boats using tracks of focal individuals or groups collected with a theodolite. Using both experimental and observational approaches, Williams *et al.* (2002a,b) showed that killer whales tended to travel 13-17% farther along a circuitous path when interacting with boats than in the absence of boats. This added travel time could carry energetic costs.

Secondly, behavioural modelling techniques can permit the assessment of mechanisms of impact. For example, one may find that dolphins spend more time travelling when boats are interacting with them. Markov-chain modelling could show whether dolphins are more likely to switch among socialising, resting, feeding or travelling during a boat interaction than in the absence of boats. Identification of the activity state in which animals are most vulnerable to disturbance can allow identification of which part of their habitat should be protected to confer most conservation benefit to animals: namely habitat that is used preferentially for that vulnerable activity. In addition, these budgets can be used to convert the consequences of human activity to other currencies, such as caloric demand, for species in which energetic cost of activity states has been measured.

Lastly, social factors have rarely been measured, or even considered, in impact assessments. For highly social species, social affiliations play a key role in the life history of individuals and populations. Spatial segregation of individuals, based on a continuum of tolerance levels among targeted animals within a social community, is likely to have negative impacts. Spatial segregation of sensitive animals within a study population in response to increasing exposure to boat-based tourism activities was detected in Shark Bay, Australia. Specifically, over two four-year periods, there was a 12.5% reduction in the number of individually identified dolphins using an impact area, while no effect was detected at a nearby control area.

Concern was expressed that a disparity exists between the time frames in which managers require information and the time that it takes for some biological effects to be detected. It was agreed that scientists must be clear about the limits to what is measurable and the difficulty in attributing changes in cetacean populations definitively to the effects of whalewatching. Similarly, it was agreed that if the research results are required for management, resources appropriate to the time-scale needed to complete the research must be made available. It was noted that opportunities exist for management actions to benefit research. For example, marine protected areas can be used not only to mitigate impact of human activity on cetaceans, but also to allow measurement of impact by providing an experimental control. It was recommended that managers and scientists work together.

The workshop concluded that the original IWC principles (IWC 1997) regarding whalewatching monitoring and management to be very helpful and appropriate and identified the following 18 additional points for consideration to be included in these principles:

(1) Marine Protected Areas (MPAs).

The group highlighted the value of multiple-use MPAs to provide integrated management with a local management presence and a planning process that includes stakeholder participation. Appropriate zoning of MPAs can be helpful in providing science with the framework for experimental design, *e.g.*, provision of

replicates and control areas. Setting aside areas that are not subject to extractive human use ('no take') is an important application of the precautionary approach. It is increasingly clear that refuge areas where no whale watching occurs are valuable both for management and for scientific evaluation as control areas in whale watch studies. Careful consideration needs to be given to identifying appropriate refuge areas to protect vulnerable animals and key behaviours

(2) Monitoring.

Managers, operators and visitors can play a role in monitoring human-cetacean interactions, biological factors and compliance

(3) Enforcement & Surveillance.

Even where regulations are adequate, enforcement has often proved problematic. We need an enhanced effort to find out how whale watching vessels operate through new and expanded methods of surveillance including the use of new technologies. Examples include VMS (vessel monitoring systems) and use of laser rangefinders.

(4) Visitor studies.

Whale watching is a two-way interaction that is managed through influencing the behaviour of the humans. This requires good social science-based studies. These provide information about the visitor demographics, attitudes, motivations, and the nature of their experiences. Passengers can also provide insight into the management of whale watching encounters.

(5) Levies and license fees.

Levies and license fees are useful in management of whale watching by providing funds necessary for education, research, enforcement etc.

(6) Education/ training of operators (including incidental) and naturalists (guides).

High quality education and training of operators and naturalists could be a cost effective way of improving compliance and ensuring sustainability.

(7) Education and interpretation for whalewatch tourists.

High quality interpretation is also an important element to increase compliance with codes of practice, enrich tourists' experiences and raise their environmental awareness.

(8) Accreditation and certification of operations.

Consideration should be given to the use of accreditation and certification systems to enhance the quality of whale watching and raise levels of compliance.

(9) Education and interpretation for the public (including recreational whale watchers).

There is a large and growing problem of recreational (non-commercial) whalewatchers and this presents an important challenge for management, especially in terms of education.

(10) Impact assessment.

Impact assessments should be conducted for whalewatching operations including consideration of environmental, social, cultural and economic issues (including ethical considerations).

(11) Importance of the iterative approach to management.

There is a need for international coordination and collaboration to ensure guidance of world's best practice in all aspects of sustainable whalewatching management. This should include all stakeholders (including managers, whale watch operators, NGOs, researchers, tourism associations, local communities, etc.) who should meet on a regular basis in order to incorporate new expertise as part of an iterative management approach.

(12) Management of whale watching in the light of other threats.

There should be consideration given to the impacts of whalewatching in context of the full range of other threats to the population(s) of cetaceans being watched.

(13) Stakeholder involvement.

A sustainable management framework needs to be initiated which incorporates full stakeholder involvement and develops a shared vision. It should include the full range of management options from law through to guidelines. In many cases, voluntary codes of conduct are not enough.

(14) Time spent with cetaceans.

New scientific findings demonstrate that controls on the time spent with cetaceans can be important. The group noted that attention should be paid to protecting critical activities. For example, Bejder *et al.* (1999) showed that duration of interactions affected the likelihood that Hector's dolphins (*Cephalorhynchus hectori*) were attracted to boats. When interactions lasted more than 70 minutes, dolphins were less likely to approach boats than one would have expected by chance. This information was used to amend existing dolphin-watching permits in this location to limit the maximum length of interactions to 70 minutes. The group recognised that the importance of time closure has not been demonstrated for any baleen whales. The group noted that a precautionary approach had been taken to whalewatch management to respect to time closure by ACCOBAMS (which recommended that cetaceans should be left alone for a period of one third of day-light hours).

(15) Managing whalewatching on a case-by-case basis.

More attention needs to be given to species-specific, population-specific and behaviour-specific approaches to management of whalewatching as well as the particular characteristics of locations and the industry.

(16) High quality whalewatching.

Consideration should be given to what constitutes the highest quality whale watching experience, noting that whalewatching with high educational and scientific value can make management easier.

(17) The triple bottom line.

The whalewatching industry has a particular responsibility to ensure that its activities are conducted sustainably. This includes full consideration of the triple bottom line of economic, social and environmental aspects and inclusion of a full analysis of impacts. The industry should recognise its responsibility for active support of research into whale watching and experimental management approaches.

(18) Feeding of wild cetaceans.

The workshop endorsed the recommendations of the IWC Scientific Committee in 2000 and 2001 (IWC, 2001, 2002) that feeding of wild cetaceans should be prohibited and existing programmes phased out. In connection with this, new work (Mann and Kemps 2003, Samuels and Bejder in press) provides further evidence of the deleterious effects of feeding programmes on cetaceans.

Although this workshop focused on the research questions that are likely to lead to feasible, measurable critical parameters to link whalewatching to impact on cetaceans, it was recognised that there are many other important areas of research. One area of interest is the contribution of whalewatching vessels to data collection. It was noted that whalewatching vessels have proven to be useful platforms for data collection. Noting that the questions relating to managements gaps were not addressed adequately (due to time constraints), the participants highlighted the need for further dialogue and cooperation among whalewatching managers, including the possibility of a specific meeting to address these and other outstanding management issues.