

## Annex M

### Report of the Sub-Committee on Whalewatching

**Members:** Urbán (Chair), Carlson (co-Chair), Antonopoulou, Currey, Double, Funahashi, Galletti, Goncalves, Hall, Haug, Holm, Iñiguez, Jimenez, Kaufman, Leslie, Lundquist, Marcondes, Nawaz, Palka, Parsons, Rendell, Reyes, Ritter, Rodríguez-Fonseca, Rojas-Bracho, Rose, Santos, Shulman-Janiger, Simmonds, Sironi, Stachowitsch, Vély, Weinrich, Williams, Willson.

#### 1. OPENING REMARKS

Urbán welcomed members of the sub-committee and noted the priority items identified by the Scientific Committee: (1) assess the impacts of whalewatching on cetaceans (methods and results of changes in behaviour and movement patterns; methods and results of physiological changes to individuals; and methods and results of demographic and distributional changes); and (2) review whalewatching in the Mediterranean and Red Seas. In addition, the following items were identified: (1) review reports from Intersessional Working Groups: Modelling and assessment of whalewatching impacts (MAWI) steering group; background document for Guiding Principles; Five-Year Strategic Plan Whalewatching Handbook; swim-with-whale operations; and in-water interactions; (2) consider information from platforms of opportunity of potential value to the Scientific Committee; (3) review whalewatching guidelines and regulations; and (4) consider emerging whalewatching industries of concern.

#### 2. ELECTION OF CHAIR AND APPOINTMENT OF RAPORTEURS

Urbán was elected Chair, Carlson was elected co-Chair, and Rose was appointed rapporteur.

#### 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/65b/WW01-WW09.

#### 5. ASSESS THE IMPACTS OF WHALEWATCHING ON CETACEANS

SC/65b/WW01 described inter- and intraspecific behaviours in cetaceans from two different settings and locations. In the Canary Islands, Spain, the behaviours of pilot whales (*Globicephala macrorhynchus*) interacting with swimmers were recorded and in Amazonas state (Brazil), several provisioning stations where tourists feed and interact with botos (*Inia geoffrensis*) were monitored (there is no swimming with these animals). Behaviours were categorised based on *a priori* ethograms and the risk they posed for physical harm to either humans or cetaceans.

During 29% of encounters, the pilot whales reacted neutrally or avoided swimmers, and during 71% they initiated one or more interspecific behaviours. Eleven different types of affiliative behaviours were documented.

Pilot whales were assumed to be disturbed by human swimmers to some extent, although their overall reaction was interpreted as 'indifferent'. As habituation to swimmers appears not to exist so far, the general prohibition on swim-with programs should be maintained. The Amazon botos, in contrast, were permanently attracted to people. Genetic analysis revealed that all food-provisioned botos were males and the animals gathering at the feeding stations represented an unnatural association, as botos are generally solitary. The dolphins performed non-risky behaviours during 36% of all encounters and eight different risky behaviours during all encounters. Botos also initiated agonistic behaviours towards conspecifics, which could compromise their health and increase stress. Humans were therefore permanently exposed to health risks at these provisioning sites. Nevertheless, because botos are encountered 100% of the time in this area, it is highly attractive for tourists and operators. Licensing of operators and regulation of feeding are being experimentally implemented.

The authors recommended that close interactions between humans and cetaceans – be it feeding or swimming – should be discouraged. The results of this study could be used as referential data before initiating new interactive programs. Long-term research should monitor for potentially negative impacts and educational programs are encouraged. The number of tourists and operations per location and population should be limited, as well as the time humans are allowed to interact with cetaceans. The amount of food handed out to provisioned animals should also be strictly limited.

The sub-committee thanked Ritter for his presentation and requested that he report back to the sub-committee at a future meeting on the implementation of regulations and licensing of boto feeding operations in Brazil, given that the management of this activity is still in its early stages. In response to a question, Ritter clarified that the authors believe that, before allowing swims or feeding by tourists, research using experimental swimming or feeding regimes should be conducted, to determine the animals' responses to these activities. The results of such research then could be used to determine if allowing swims or feeding should proceed.

It was noted that water clarity may be a risk factor in the boto feeding situation. More turbid water might slow reaction time by people feeding the dolphins, resulting in more biting incidents. Several comments were made about the ethograms used in these studies. It was noted that natural behaviours should be distinguished from those that are solely the result of the interaction (such as biting people). The discussion also addressed the subjectivity of assigning behaviours to categories such as 'risky' and 'not risky'. Behavioural codes or categories are a necessary tool, but some standardisation seems called for. Some behaviours are species- or temporally-specific – the same behaviour may not mean the same thing in different species or at different periods of the year (generally behaviour is context specific). In response, it was noted that many established ethograms exist, but they may overlap and differ in key ways. The

sub-committee **agreed** that researchers conducting impact studies with specific species should work to standardise ethograms to ensure comparability of results.

The Committee made a recommendation at SC/65a that an international scientific workshop be organised involving scientists and managers from the boto range states, with the goal of addressing research and conservation priorities, standardising methodologies and planning long-term strategies (IWC, 2014). The sub-committee, noting its concern with the information on boto feeding reported in SC/65b/WW01, which has clearly altered the botos' natural behaviour and could be making the animals more susceptible to hunting, **endorsed** the Committee's recommendation.

At SC/56, the sub-committee noted that much research on whalewatching was published each year of direct relevance to the work of the sub-committee. The sub-committee agreed that a summary report or digest of published whalewatching research, for information without discussion, would be useful, particularly in highlighting new or useful methodologies of interest. Parsons was asked to collate the material for presentation on an annual basis.

SC/65b/WW02 summarised three papers addressing the impacts of whalewatching on cetaceans. Many studies have been published on cetacean tourism impacts, primarily behavioural changes. However, few papers are available on changes in cetacean vocalisations (e.g. whistles, clicks) in the presence of tourism vessels. Luis *et al.* (2014) documented the vocal responses of dolphins in a control setting (no vessels) and in the presence of different vessel types, including dolphin watching vessels, in the Sado Estuary, Portugal.

Studies have examined the long-term effects of cetacean tourism on odontocete reproductive success and, in turn, their population growth rates, but the same data are deficient for mysticetes. Christiansen *et al.* (2013) evaluated the energy budgets for Icelandic northern minke whales (*Balaenoptera acutorostrata*), using both field observations and a step-wise modelling approach. The behavioural observations from this study were discussed at SC/64 (IWC, 2012).

The sub-committee has been concerned about food-provisioning and its impact on cetaceans for several years. In 1988, commercial dolphin feeding programs were initiated north of Savannah, Georgia (USA). These activities were banned in 1993 under the authority of the US Marine Mammal Protection Act (MMPA). The prohibition arose because injury and death were more evident amongst dolphins that accepted food hand-outs (Donaldson *et al.*, 2010). In recent years, the commercial interactions in Georgia shifted from provisioning dolphins to dolphin watching tours. However, 'begging' dolphins continue to be observed. Perrtree *et al.* (2014) sought to determine the type and prevalence of human-interactions of common bottlenose dolphins in the Savannah region using boat-based survey methods.

Perrtree *et al.* (2014) showed that begging and other abnormal behaviour can persist more than 20 years after banning food provisioning, strongly suggesting that this activity could have long-term detrimental behavioural impacts on cetaceans. It was noted that this persistence may be because periodic (and illegal) feeding still occurs in the area, thus reinforcing the behaviour.

At SC/64, the Committee expressed concern over the impacts of ineffectively managed dolphin watching in Bocas del Toro, on the Caribbean coast of Panama, and recommended continued monitoring of the impacts of dolphin watching activities on this population (IWC, 2013). This recommendation was 'strongly' reiterated at SC/65a (IWC, 2014). The resident bottlenose dolphin (*Tursiops*

*truncatus*) population in the entire archipelago of Bocas del Toro is probably less than 250 dolphins (unpublished data), but only 105 of these dolphins frequent Dolphin Bay, where dolphin watching activity is concentrated.

SC/65b/WW06 presented data collected by boat-based surveys monitoring dolphin behavioural categories (foraging, socialising, travelling, and diving) in the presence and absence of dolphin watching boats. The number of boats present and the overall response (neutral, negative, or positive) of the dolphins was recorded. There were significant differences in dolphin reaction to the research and dolphin watching boats: 93.6% of the interactions between the research boat and dolphin groups were 'neutral', while 'neutral' reactions to dolphin watching boats dropped from 80.6% in the presence of one dolphin watching boat to 39.7% when more than three boats were present. 'Negative' reactions to boat presence increased four-fold as the number of dolphin watching boats went from one to more than three. When dolphins were only in the presence of the research boat, they spent significantly more time foraging. When multiple boats were present, a significant positive correlation was found between diving frequency and boat presence. In contrast, foraging and social behaviours were significantly negatively correlated with an increase in boat presence. However, groups with calves significantly increased the frequency of travelling behaviour when more than three boats were present.

The sub-committee welcomed this update on the situation in Bocas del Toro and **reiterated its continued and extreme concern** regarding the lack of enforcement of regulations (IWC, 2013; 2014). It noted with concern that the boat presence (up to 39 boats on one group) reported in SC/65b/WW06 was in the tourist low season; in high season, boats can number up to 100 or more. In addition, in the last three years (2012-14), 10 dolphins have died in Dolphin Bay due to boat strikes (see SC/65b/WW09, item 9). Updates such as this are important to evaluate the efficacy of regulations and their enforcement.

The sub-committee **emphasised** that situations of extreme concern like Bocas del Toro, where recommendations need to be directly communicated with governments, need a mechanism to bring them to the attention of the Standing Working Group and the Conservation Committee.

The sub-committee **endorsed** the following recommended mitigation measures from SC/65b/WW06, which are consistent with the Guiding Principles (see SC/65b/WW04).

- (1) Currently, any person who owns a boat and takes tourists to see the dolphins is issued a license; instead, licensing should be limited and license issuance should be regularly re-evaluated.
- (2) Operator training workshops and a certification program for best dolphin watching practices should be developed and implemented.
- (3) A maximum of two dolphin watching boats should follow a single group of dolphins at one time.
- (4) New boats arriving and encountering a dolphin group should remain outside a 'waiting zone' of 300m, and allow a 30 min 'resting time' before approaching dolphins after a previous interaction.
- (5) Arriving boats should either stop in the 'waiting zone' if other boats are already present, or move to other parts of the bay to look for a different group of dolphins.

The sub-committee also **agreed** that speed restrictions and propeller shrouding can reduce collision risk and severity between dolphin watching boats and cetaceans.

Table 1  
Whalewatching operations in the Mediterranean, adapted from O'Connor *et al.* (2009).

Country	Area	No. oper.*	Reg/ Bp**	Res***	Species	Notes
Croatia	Lošinj Island in the Cres-Lošinj archipelago of western Croatia.	1	N	Y	Bottlenose dolphin.	Blue World Institute of Marine Research and Conservation conducts scientific research and conservation; offers research trips; may be some opportunistic tours.
Cyprus	Famagusta District, East Cyprus	1	N	N	Bottlenose, short-beaked common and striped dolphin.	Opportunistic nature tour.
Egypt	Samadai Reef, Satayah reef, Marsa; Alam on the Red Sea	52	Y	?	Spinner dolphin.	Boat-based dolphin watching, as well as swim/snorkel/dive-with.
France	Sanary and Hyères; Carry-le-Rouet; Ajaccio; Fréjus; Nord-Pas de Calais	23	Y	Y	Sperm and fin whale, striped, Risso's and bottlenose dolphin.	Pelagos Sanctuary.
Greece	Island of Kalamos; Gulf of Corinth; Crete	7	N	Y	Sperm and Cuvier's beaked whale, bottlenose, short-beaked common, Risso's and striped dolphin.	Primarily part of eco-tours; some research excursions.
Italy	Genova; San Remo; Viareggio; Forio; Imperia	6	Y	Y	Fin and sperm whale, bottlenose, short-beaked common, Risso's and striped dolphin, long-finned pilot and Cuvier's beaked whale.	Pelagos Sanctuary.
Monaco	No established port	Minimal	N	N	Fin and sperm whale, bottlenose, short-beaked common, Risso's and striped dolphin, long-finned pilot whale.	Primarily opportunistic, Pelagos Sanctuary.
Morocco	NEED UPDATE	Minimal	N	Y	??	-
Slovenia	Slovenian waters (Piran, Izola, Koper)	1 (research)	N	Y	Bottlenose dolphin.	Morigenos - Slovenian Marine Mammal Society carries out scientific research and conservation activities. Eco-volunteers take part in research. No commercial dolphin watching exists.
Spain	Tarifa, Estépona, Bilbao	16	Y	Y	Fin, sperm and minke whale, bottlenose, short-beaked common, Risso's and striped dolphin, harbour porpoise, killer whale, long-finned pilot whale.	

\*number of operators; \*\*regulation/best practices; \*\*\*research.

It was noted that this situation may be repeated in other Central American countries where dolphin watching is not yet established but may soon be. Concerns in this region include lack of operator training; rapid expansion (outstripping the pace of holding training workshops); over-eager passengers who at times have taken the wheel to get closer to the dolphins; low prices for a trip; and local corruption, which lowers compliance. It was also noted that operators rarely inform the passengers of the regulations or the animals' conservation needs or ecology, so they do not manage their customers' expectations well or at all. One solution to this last point is for a seat to be reserved, even on a small boat, for a naturalist – potentially sourced from local universities.

Others noted that Bocas has strong community support for improving the dolphin watching situation, meaning 'bottom-up' enforcement of the regulations may be more effective than outside 'top-down' enforcement. The sub-committee **agreed** that responsible whalewatching operators from other areas or regions, using best practices and making efforts to be sustainable in their operations, should attend Bocas (and other area) training workshops, where they could be helpful advocates for encouraging sustainable dolphin watching practices, i.e. peer-to-peer advice rather than a 'top-down' approach to training, which has often proven to be unsuccessful. All stakeholders, including local and even national tourism providers (e.g. hotel operators, airlines) should be involved in workshops to help ensure the widest possible buy-in to any management regime.

## 6. REVIEW WHALEWATCHING IN THE MEDITERRANEAN AND RED SEAS

Table 1 is a summary from O'Connor *et al.* (2009) on world-wide tourism numbers and expenditures from whalewatching. The number of operations listed in the table for some countries may have increased significantly over the past five years. For example, detailed information was received from Souffleurs D'ecume on the regions in France bordering the Pelagos Sanctuary, where there are now 28 operations, an increase of 15 since 2012. In other countries, such as Slovenia, whalewatching remains minimal with little or no commercial activity.

In discussion, it was noted that the response to requests for input on whalewatching in the region of the meeting has been insufficient to put together a comprehensive and up-to-date review of the state of the industry for the past several years, with a few exceptions. The sub-committee **agreed** that a more efficient mechanism for reviewing whalewatching regionally each year would be to task a member of the sub-committee with compiling a basic review of the industry in the region of the next year's meeting, after which this basic review would be distributed to the rest of the sub-committee, regional Committee members, other regional researchers, and regional whalewatching operators for comment and revision. The Conservation Committee could be approached for help with this distribution. Kaufman, Weinrich, and Shulman-Janiger volunteered to draft the basic review for SC/66, which was likely to be for the northeastern Pacific region, primarily using web searches.

## 7. REVIEW REPORTS FROM INTERSESSIONAL WORKING GROUPS

### 7.1 Modelling and Assessment of Whalewatching Impacts (MAWI) steering group

At SC/65a, the Committee established an intersessional working group to investigate the modelling and assessment of whalewatching impacts (MAWI), replacing the Large-Scale Whalewatching Experiment (LaWE). The MAWI group was tasked to define the specific research questions and hypotheses that would best advance understanding of the impact of whalewatching, identify those whalewatching locations that would be most suitable and amenable for targeted studies addressing these questions, and summarise the current modelling tools available to analyse the data that will be collected.

SC/65b/WW08 summarised the progress with MAWI to date. Regarding the second task, suitable locations should be in accessible areas where: the potential for whalewatching exists; has not yet started or is in its infancy; control areas can be established; there is an elevated site in near proximity allowing for land-based observations; and some data on the target species exists. Sites that meet these criteria include Isla de Chiloe (blue whales, *Balaenoptera musculus*), Haiti (sperm whales, *Physeter macrocephalus*), Oman (humpback whales, *Megaptera novaeangliae*) and American Samoa (humpback whales). To better determine sites, a grid detailing all criteria by potential sites will be developed and presented at SC/66.

A variety of different data collection methods have been used when analysing the impacts of whalewatching vessels on cetaceans. Regardless of the method, covariates common across studies include, but are not limited to, the number and type of boats in proximity to the species of concern, focal species' behaviour and respiration rate.

The variety of statistical approaches used to estimate the effects of whalewatching on cetaceans appear not to have closely followed statistical developments, but instead appear to have been determined by a combination of the researchers' skill sets, the question under consideration and the exact nature of the data collected. The approaches can be divided into roughly four categories: (1) comparison of groups; (2) regression methods; (3) Markov-chains; and (4) modelling and simulation.

For group comparisons, the statistical tests used have included parametric tests, which allow researchers to determine whether there is a statistically significant difference in aspects (e.g. mean, variance) of the groups when exposed to whalewatching. For regression analyses, approaches have included generalised linear models (GLM) and generalised additive models (GAM), which are almost always going to be more appropriate than standard linear regression because of model assumptions. Given the time-dependent nature of much of whalewatching data (e.g. focal follows), Markov chains are well suited to their analysis. This approach permits researchers to investigate whether the transitions between states (e.g. behaviour) are dependent on influences such as whalewatching. Lastly, tools such as agent-based modelling can be very powerful, as they allow researchers to investigate how species of concern and whalewatching vessels interact with one another and then predict how these agents may respond to changes in the system (e.g. an increase in the number of whalewatching vessels).

The type of data currently being collected on species affected by whalewatching may not be sufficient to answer the questions of research and conservation interest.

Therefore, if we seek to improve our understanding of the impact of whalewatching on cetaceans, it will be necessary to reassess the current standard of data collection for whalewatching studies in terms of type of data, to ensure its relevancy to a wider range of research questions than has been fully considered to date. For example, for some species it is possible to record visual health assessments or stress levels, which could help inform questions on the long-term impact of whalewatching.

Overall, the methods used to assess whether a species shows a short-term response to disturbance are well established. Of increasing interest are the mechanisms by which whalewatching has an impact on individuals, as well as the effects this can have on the long-term health and persistence of a population. This last is of particular importance, since a short-term change in behaviour does not automatically translate into a long-term impact. It is therefore imperative that the types of data collected in whalewatching studies be broadened and that new statistical and modelling developments be integrated into whalewatching research to ensure that a wider array of research questions can be answered with the most appropriate and powerful tools.

To facilitate this aim, the MAWI steering group will be presenting a symposium and small Workshop at the 2014 International Marine Conservation Congress in Glasgow (18 August 2014), with the aim of receiving input and feedback from the wider marine conservation community. The steering group will report back to SC/66 on this symposium.

The sub-committee welcomed this paper and looks forward to further discussion at SC/66. It was noted that Haiti is just beginning development of a whalewatching (and swimming) industry with sperm whales and researchers will be starting work there soon. This may therefore be an ideal site to offer input to MAWI. To identify additional sites, announcements on list serves, such as MARMAM, may be effective. In response to a question as to whether some of the models being considered are flexible when variables differ between sites, it was noted that the MAWI group is seeking to determine which models will work best for which species and variables.

### 7.2 Background document for Guiding Principles

SC/65b/WW04 reported on the intersessional Working Group on Guiding Principles development. The group was tasked to develop a 'background document' to annotate the Guiding Principles, with an explanation of their origin and evolution, as well as definitions of terms and other explanatory background. Where applicable, individual principles were followed by an (R) for 'research-based', indicating principles that are based at least in part on research findings, or (BP) for 'best practise', indicating principles based on best practises. Many of the principles labelled (BP) are based on the Precautionary Principle and have been used in various management schemes for years. Some may have been drafted in workshops over the past few decades, others reflect principles that are commonly used in many areas; for most, the specific origin is unknown. Principles based on or tested by research will be followed by references identified at SC/65b. It is important to note that these references will represent only a subset of the studies that have been published, including those specifically designed to assess potential impacts of whalewatching, and are not exhaustive.

The sub-committee thanked the intersessional working group for this document. In discussion, it was clarified that this document is the response to a request from Commissioners at SC/65a, who requested clarification on

which of the Guiding Principles were derived from research and which from best practises. One member noted that most of the Guiding Principles began as best practise, but were later evaluated with research and determined to be supported by science. Another noted that the progress made with whalewatching, in terms of ground-truthing best practise with research, has been far in advance of the progress made in the arena of marine noise, which is still relying mostly on best practise, including mitigation measures that an increasing body of research shows may be ineffective at protecting marine mammals.

### 7.3 Five-Year Strategic Plan Whalewatching Handbook

Rojas-Bracho presented an outline of the Handbook. It will include chapters that provide important definitions and concepts for whalewatching. Among them will be the role of the Commission, the Five-year Strategic Plan for Whalewatching (prepared by the Conservation Committee's Standing Working Group on Whalewatching), the rationale for an online Handbook, what it can and cannot do, and who the target audience is.

A chapter involving significant input from the sub-committee will be on the role of science. The sub-committee's work on addressing this topic is ongoing and it is envisioned that this chapter will be amongst the longest in the Handbook. The chapter will focus on a number of overlapping themes aimed at providing advice on threats and mitigation measures, and evaluating whether measures are working or are likely to work. It will highlight strengths and weaknesses of various management approaches by operation type and circumstances, as well as species.

The chapter on management, although not within the sub-committee's remit, will still be based on the best available science and therefore will require the sub-committee's input. It will include the Guiding Principles, developed at SC/65a and SC/65b.

In discussion, it was noted that 'populating' the Handbook is a long-term project. It is a 'living document' and will evolve as new information becomes available. It should include not only examples of what works but what does not work (for example, regulating swim-with encounters with humpback whales in the Dominican Republic works for the most part; see Item 7.4).

One member noted that different stakeholders will have different agendas in terms of developing this Handbook, e.g. operators are motivated by business objectives, while managers are motivated by a need to regulate whalewatching. This should be kept in mind during this process. The sub-committee urged members of the sub-committee to offer their input proactively on various specific sections of the Handbook, as appropriate. It was suggested that sub-committee members who will attend the International Marine Conservation Congress in Glasgow in August 2014 should meet to discuss progress on populating the Handbook.

There was a general desire expressed by the sub-committee for clarification of the relationship between the Commission and the Committee regarding the development of the Handbook. The sub-committee Chair and co-Chair will work with the chair of the Conservation Committee to address this concern. The sub-committee **agreed** that a budget request for assistance with developing the Handbook should be forwarded to the Standing Working Group on Whalewatching for consideration and submission to the Commission.

The intersessional group will continue (see Table 2) and will present an update at SC/66.

### 7.4 Swim-with-whale operations

Papers were presented at SC/55 and SC/57 (Rose *et al.*, 2003; 2005) on swim-with-whale operations, suggesting they were becoming wide-spread, and should be more fully reviewed in the future. In order to fulfil this task, and to monitor the development of the industry, an intersessional correspondence group was established in 2005 and SC/65b/WW03 is an update of the earlier work. Web searches were conducted using a variety of search terms in English. There are sources of positive and negative bias in such a web search – positive bias arises from situations where multiple agencies share the services of a smaller number of vessels. Negative bias arises from using only one language (many whalewatching operators conduct business primarily in other languages). Within these limitations, 67 commercial operations (compared to 44 in 2005 and 21 in 2003) were identified offering swim-with-whale encounters or strongly implying such encounters could occur during excursions. Once again, swims with humpback whales were found most frequently, although other baleen whales were also targeted, including dwarf minke (*Balaenoptera acutorostrata*), blue and fin (*B. physalus*) whales. A small number of operators offered swims with toothed whales, including Cuvier's beaked whales (*Ziphius cavirostris*) and sperm whales. Some areas, including French territories (Rurutu, Tahiti, and Mayotte), had increasing numbers of swim-with-whale operations since the last review, while others (e.g. Niue) had decreasing numbers.

Canada had three operators offering cold-water swims with bowhead whales (*Balaena mysticetus*) (up from one in 2005). Iceland and Sri Lanka were entirely new jurisdictions offering swims, with multiple species and blue whales respectively. Swim-with-whale operations appear to be increasing globally.

In discussion, it was suggested that future such reviews address the two types of bias in an effort to determine a more accurate number of vessels operating swim-with encounters (rather than agencies or companies). In response, it was noted that the questionnaire discussed at SC/59 (Rose *et al.*, 2007) would help minimise some of this bias. Another suggestion was to follow up on cases like Argentina, where based on web searches it is not clear whether at present operators are allowing people in the water with southern right whales (*Eubalaena australis*) or not. It was noted that Costa Rica has officially banned swimming with cetaceans, but some operators are going far enough offshore to evade the coast guard and may be allowing swims. So even where there are bans, monitoring effort should continue to ensure enforcement where needed. It was noted that on Silver Bank in the Dominican Republic, regulation has become more stringent; *inter alia*, fishing is now banned when humpbacks are present, only four boats are allowed to operate swims, the area where they can operate is small compared to the full area used by the whales, and tourists can only float, not swim (compliance may be less than 100%, but it is still high).

Funahashi noted that there are operations that conduct large-whale swims in Japan. She has started an investigation into this activity. The sub-committee welcomed this information and asked Funahashi to report back to the sub-committee on her work at SC/66. The sub-committee urged its members to contribute this type of information to the intersessional group on whale swims, particularly in regions (such as Asia) where language barriers may exist.

The intersessional group will continue (see Table 2) and will present an update on questionnaire distribution at SC/66.

### 7.5 In-water interactions

A study is underway in Dominica focusing on sperm whale swims. More work on ethograms is also being undertaken, addressing issues such as how to standardise categorising behaviours as 'risky' and 'not risky'. The intersessional group will continue (see Table 2) and will present an update on efforts at SC/66.

## 8. CONSIDER INFORMATION FROM PLATFORMS OF OPPORTUNITY OF POTENTIAL VALUE TO THE SCIENTIFIC COMMITTEE

SC/65b/WW05 reported further on Whale and Dolphin Tracker (WDT), a web-application for recording cetacean sighting data in real-time. It presented the occurrence of encounters with several cetacean species from data collected on platforms of opportunity using WDT from four vessels off Maui, Hawaii. This customisable web-application, developed in-house by the Pacific Whale Foundation, records sighting data in real-time from its vessels. Preliminary results indicate that WDT can be a cost-effective web-based data management system providing a large amount of data (including effort). Despite biases inherent to platform of opportunity data collection, implementing a system like WDT world-wide would enhance both research and management efforts to monitor distribution and relative abundance of cetaceans. This is particularly pertinent to whalewatching vessels and other platforms of opportunity, which have the potential for making invaluable contributions to research, given the number of tours being offered on an annual basis, especially in areas where data are lacking.

The sub-committee thanked the authors for this paper and the work done on WDT. It was noted that WDT is highly customisable and is consistent with the Guiding Principles on data collection systems as outlined in SC/65b/WW07 (see below). The two papers on this topic (SC/65b/WW05 and SC/65b/WW07) are complementary and the Commission website could host both.

IWC (2005) reported on progress on a 'data recording system' (DRS), an effort by the sub-committee to standardise data collection from whalewatching vessels (De Boer and Simmonds, 2004; Simmonds *et al.*, 2002). The DRS was web-based and had several features that would allow customising for various circumstances (e.g. species, type of vessel, habitat). Although the sub-committee requested further development of the DRS, the project has not progressed beyond the prototype stage.

SC/65b/WW07 followed up on this previous effort. It proposed guiding principles for data collection from platforms of opportunity, to be hosted by the Commission website, which would help ensure a higher standard of data from whalewatching vessels. Basic parameters a data collection system should include were listed, along with explanations on why these parameters are important to record, especially useful for operators with minimum familiarity with scientific data collection. It also addressed data quality control, an important aspect of citizen science. A quality control system would be multi-layered; the first layer would be the use of a data collection system based on the guiding principles. The second layer could be an online submission system for field data, ideally in collaboration with local universities or research projects, where each operator can log into an individual account and enter data and upload pictures. A third level would be the systematic evaluation of the submitted data by a qualified researcher, with feedback to the reporting vessels. A final level would be periodic onsite inspections of data collection. The ready

accessibility of guiding principles for data collection on the Commission website would help ensure that accurate and useful platform-of-opportunity data (e.g. spatial and sighting effort) are collected by more whalewatching operators and that data will be comparable on a global scale.

In discussion, it was felt that the Commission website should not host a prototype data sheet, as there are simply too many variables, depending on species targeted, location, language, and so on, to determine what a 'typical' data form should look like. However, guiding principles on a data collection system would be useful and the sub-committee **agreed** that those presented in SC/65b/WW07 should be refined and then added to the website. It also **recommended** that the final data collection guiding principles be added to the Handbook. The sub-committee **agreed** to establish an intersessional working group whose task would be to finalise the guiding principles for SC/66, with Rose as Convenor. The rest of the intersessional group's composition should be diverse, including at least one operator and one researcher who uses data from platforms of opportunity (see Table 2).

## 9. REVIEW WHALEWATCHING GUIDELINES AND REGULATIONS

Carlson noted that the 2014 compilation of worldwide whalewatching regulations would be on the Commission website by September 2014.

SC/65b/WW02 summarised Dimmock *et al.* (2014), which studied the perspectives of two stakeholder groups (resource managers and commercial whalewatching operators) in relation to industry knowledge and information exchange. The results suggest that communication between the two groups is poor, including communication on the nature of regulations, making compliance levels in whalewatching operations likely to be low.

As noted in Item 5, dolphin watching is currently one of Bocas del Toro's most popular tourist attractions and there is extreme concern about the viability of the resident bottlenose dolphin population: between 2012-14, 10 resident dolphins were known to have been killed as the result of boat strikes, and as the population is small (105 animals using the main dolphin watching area), the level of this source of mortality is almost certainly unsustainable.

In 2007, whalewatching regulations were established in Panama (via Resolution ADM/ARAP No. 01). However, a lack of enforcement of these regulations and apparently high levels of non-compliance by dolphin watching operators (such as failing to obey the minimum approach distance of 100m) led the Scientific Committee to 'strongly recommend that the Panamanian authorities enforce the relevant whalewatching regulation (ADM/ARAP No. 01) and that they particularly promote adherence to dolphin watching guidelines, especially boat numbers and approach speeds and distances' (IWC, 2013, p.319) and further recommended continued monitoring of the situation.

SC/65b/WW09 evaluated the level of whalewatching guideline compliance and the effects of compliance, or lack thereof, on dolphin behaviour in Bocas del Toro. Using boat-based surveys, information was recorded on the number of boats present, the type of boat, and the distance of boats to dolphins. The boats' actions (e.g. approach speed, direction of approach, engine status) and type of manoeuvring with respect to dolphins observed (e.g. circling, chasing, following) were also recorded every minute. A total of 63 dolphin encounters were recorded from June through September 2013. Of these, 16 were control encounters with no dolphin watching boats present, 24

encounters had only travelling boats or canoes in proximity to dolphins, and 21 encounters had dolphin watching boats present. During all of the dolphin encounters where dolphin watching boats were present, Panama's 100m minimum distance regulation was violated at least once. Operators complied with Panama's requirement to have their engines off or idle within 50m of dolphins only 33% of the time. Boat operators were also observed driving straight through the middle of dolphin groups – another violation – on 12 separate occasions, circling dolphins 13 times, and leaving the site at high speeds 17 times. The regulation allowing only two boats simultaneously to follow cetaceans was also regularly violated; 42% of the time there were three to 15 boats present, with a maximum of 36 boats presence on one occasion.

There was a clear difference in dolphin behaviour between periods when dolphin watching vessels were compliant with regulations and when they were not. There was a 48% increase in dolphin 'disappearance' behaviour when dolphin watching boats were not following distance regulations. Other classes of dolphin activity that increased when boat operators were non-compliant included slow travel (45%), shallow dives (56%), deep dives (49%) and tail slaps (18%).

The authors noted that sustainable tourism and training workshops for the community and boat operators are urgently needed in Bocas del Toro. These workshops should provide general bottlenose dolphin information (e.g. basic biology, threats, and behaviours) specific to the local population, as well as information about the research on impacts of whalewatching on cetaceans and whalewatching management best practises globally, such as 'whale ecotourism' definitions (Parsons *et al.*, 2006). Finally, it should be required that all dolphin watching vessels place the regulations in a visible location on board their vessels, so tourists can be aware of the regulations. As with SC/65b/WW06 in Item 5, the sub-committee **endorsed** these recommendations.

In discussion, it was noted that bottom-up enforcement (peer oversight) of the regulations may be more effective, as official enforcement is lacking and there is community support for better management of the dolphin watching situation. It was also suggested that local and international NGOs should be more involved in promoting the regulations and supporting workshops. Iñiguez noted that Argentina is still working with Panama and the Bocas del Toro governments, but progress has been slower than expected. He intends to provide the sub-committee with an update at SC/66. The sub-committee **agreed** that research on dolphin watching impacts and community engagement in Bocas del Toro is important and that identifying funding sources is a priority.

## 10. CONSIDER EMERGING WHALEWATCHING INDUSTRIES OF CONCERN

### 10.1 Review of workshops in Oman

At SC/65a, the sub-committee was updated on progress with the development of whalewatching guidelines, an effort undertaken as a multi-stakeholder initiative by Environment Society of Oman (ESO) and funded by the Commission. Willson presented an update on this initiative, which is following the objectives established in the first year of this effort. A series of workshops held over the past year focused on delivering and demonstrating whale and dolphin watching guidelines and featured on-water training sessions. A poster

and boat sticker were designed and distributed to operators, promoting the guidelines. The Ministries of Tourism, Fisheries Wealth and Agriculture, and Environment and Climate Affairs were consulted in the process and visited with operators in Muscat, Salalah and Dhofar. Positive feedback and requests for further training were received from many participants. In support of the objective to promote data collection from whalewatching vessels, the research team has received 17 sighting records of humpback whales since February from an operator involved in the initiative, providing valuable records to the Oman Whale and Dolphin sightings catalogue. Continued funding support is requested to consolidate this work, including development of an Oman Whalewatchers Association to make the initiative self-sustaining, and to focus specific training on operators in the Halaniyat Islands, where they are interacting with Arabian Sea humpback whales.

The sub-committee thanked Willson for this update and expressed enthusiasm for the positive nature of developments in Oman, which were partially in response to the recommendation of the sub-committee (IWC, 2013). In response to a question regarding the current status of discussions with the various ministries, Willson replied that meetings with these ministries were positive, with ESO expressing an interest in accreditation and regulation of operators. In consideration of this, the next step is understanding carrying capacity of this industry. Continuation of training workshops is especially urgent in areas where operators are targeting local populations of *Sousa*. The sub-committee **recommended** that this work continue and that funding be identified for it in the Committee's budget for the next two years. It **agreed** to keep this as a standing item on the agenda.

## 11. OTHER ISSUES

Stachowitsch outlined several potential strategies to make sub-committee (and Committee) recommendations more visible and effective, especially urgent statements involving highly endangered or isolated cetacean species/populations (see also Item 5). These include: extracting and combining recommendations in a separate short document, enabling follow-ups by introducing a new sub-committee agenda item ('progress on previous recommendations'), and establishing intersessional groups with terms of reference related to promoting recommendations beyond the Commission.

The sub-committee **agreed** to add 'progress on previous recommendations' to its agenda (see Item 12) and to discuss in plenary the idea of intersessional groups tasked to promote recommendations beyond the Commission.

Funahashi presented information on a new development with whalewatching operators in Japan. In June 2014, local whalewatching associations, operators, guides and industry-related personnel will form the Japan Whale-Dolphin Watching Council from seven areas, to promote a responsible, sustainable whalewatching industry in Japan. It may seek advice from the sub-committee or its members and hopes to contribute to the work of the sub-committee in future.

The sub-committee thanked Funahashi for this information and **strongly endorsed** the formation of the council to promote responsible, sustainable whalewatching in Japan. The sub-committee **recommended** that the council expand its membership by contacting established operators in other regions of Japan. It was also suggested that the council contact established operators in other countries. Funahashi agreed to draft a document describing the council

Table 2

Intersessional working groups and related information.

Group	Terms of reference	Membership
Modelling and Assessment of Whalewatching Impacts (MAWI) steering group	Define specific research questions and hypotheses that will benefit understanding of the impact of whalewatching, identify those whalewatching locations that would be most suitable and amenable for targeted studies addressing these questions, and summarise the current modelling tools available to analyse the data that will be collected.	New (Convenor), Carlson, Cook, Kaufman, Leaper, Parsons, Ritter, Robbins, Rose, Simmonds, Weinrich
Swim-with-whale operations	Assess the extent and potential impact of swim-with-whale operations	Rose (Convenor), Gero, Kaufman, Parsons, Ritter, Sironi, Weinrich
In-water interactions	Identify and investigate potentially dangerous recreational interactions between free-ranging cetaceans and people in the water, emphasising the extent of the problem and research on behavioural 'warning indicators'; identify research gaps and summarise information.	Ritter (Convenor), Gero, Parsons, Rose, Scheer, Simmonds, Vermeulen
Populating the Five-Year Strategic Plan Whale-watching Handbook	Collate information to assist Commission's Standing Working Group on Whalewatching to populate the Whalewatching Handbook	Rojas-Bracho (Convenor), Carlson, Iñiguez, Kaufman, Luna, Parsons, Ritter, Weinrich
Guiding principles for data collection forms	Work on finalising a list of standardised elements, with descriptions/explanations, which should be included in a data collection form for use on platforms of opportunity, to be hosted by the Commission website	Rose (Convenor), Carlson, Kaufman, Ritter, Rodriguez-Fonseca, Robbins, Vinding, Weinrich

and its goals for global distribution via sub-committee members. It was noted that this fledgling effort would be an ideal location to promote and test the use of Whale and Dolphin Tracker.

Carlson offered an update on Robbins' work to identify data sources from platforms of opportunity of potential value to the Scientific Committee. There have been delays in its development, but it should be online in the near future.

Attention of the sub-committee was drawn to a new publication, *Whale-watching: Sustainable Tourism and Ecological Management*, published by Cambridge University Press, for which several members of the sub-committee are chapter authors and/or editors. The sub-committee **agreed** that this book is an important contribution to the study of whalewatching and congratulated the editors on this accomplishment.

## 12. WORK PLAN

The work plan prioritised major items as listed below.

- (1) Assess the impacts of whalewatching on cetaceans (methods and results of changes in behaviour and movement patterns; methods and results of physiological changes to individuals; and methods and results of demographic and distributional changes). In addition, the following items were **agreed** for the next meeting.
- (2) Review reports from Intersessional Working Groups: (i) Modelling and Assessment of Whalewatching Impacts (MAWI) steering group; (ii) swim-with-whale operations; (iii) in-water interactions; (iv) populating the Handbook; and (v) guiding principles for data collection forms from platforms of opportunity.
- (3) Review progress on Five-Year Strategic Plan for Whalewatching.
- (4) Review whalewatching in the region of the next meeting.
- (5) Consider information from platforms of opportunity of potential value to the Scientific Committee.
- (6) Review of whalewatching guidelines and regulations.
- (7) Emerging whalewatching industries of concern.
- (8) Progress on previous recommendations.

The sub-committee discussed the work plan and set priorities for the next two years as listed. Terms of reference

and members of the Intersessional Working Groups as **agreed** by the sub-committee are listed in Table 2.

## 13. ADOPTION OF THE REPORT

The report was adopted at 12:10hrs on 19 May 2014. The sub-committee thanked Urbán and Carlson for their wise guidance during the discussions and Rose for her efficient rapporteuring.

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## Appendix 1

### AGENDA

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| <ol style="list-style-type: none"> <li>1. Opening remarks</li> <li>2. Election of Chair and rapporteurs</li> <li>3. Adoption of Agenda</li> <li>4. Review of available documents and information</li> <li>5. Assess the impacts of whalewatching on cetaceans (methods and results of changes in behaviour and movement patterns; methods and results of physiological changes to individuals; and methods and results of demographic and distributional changes)</li> <li>6. Review whalewatching in the Mediterranean and Red Seas</li> <li>7. Review of intersessional working groups             <ol style="list-style-type: none"> <li>7.1 Modelling and Assessment of Whalewatching Impacts (MAWI) steering group</li> </ol> </li> </ol> | <ol style="list-style-type: none"> <li>7.2 Background document for Guiding Principles</li> <li>7.3 Five-Year Strategic Plan Whalewatching Handbook</li> <li>7.4 Swim-with-whale operations</li> <li>7.5 In-water interactions</li> <li>8. Consider information from platforms of opportunity of potential value to the Scientific Committee</li> <li>9. Review whalewatching guidelines and regulations</li> <li>10. Consider emerging whalewatching industries of concern.             <ol style="list-style-type: none"> <li>10.1 Review of workshops in Oman</li> </ol> </li> <li>11. Other issues</li> <li>12. Work plan</li> <li>13. Adoption of the Report</li> </ol> |
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