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Agenda Item 26.2

**MARINE WILDLIFE WATCHING**

*(Prepared by the Scientific Council and the Secretariat)*

Summary:

As requested in Decisions 12.51 a) and 12.79 a) the workstreams on *Recreational In-Water Interactions and Sustainable Boat Based Marine Wildlife Watching* have been combined into one, entitled Marine Wildlife Watching.

This document reports on progress to implement Decisions 12.50 – 12.52 on *Recreational In-Water Interactions*, and Decisions 12.78 – 12.80 on *Sustainable Boat Based Marine Wildlife Watching* and proposes Decisions for adoption.

A document entitled *Recreational In-Water Interactions with Aquatic Species: Review of Existing Guidelines and Issues of Concern*, is presented in Annex 2.



The Government of the Principality of Monaco were recognized as Champion Plus for their generous support and commitment towards marine species conservation for the period 2018 – 2020. This activity has been funded with the contribution granted by Monaco under the Migratory Species Champion Programme.



## MARINE WILDLIFE WATCHING

### Background

1. At its 12<sup>th</sup> meeting (COP12, Manila, 2017), the Conference of the Parties considered two related agenda items: Recreational In-Water Interaction with Aquatic Mammals and Sustainable Boat-Based Marine Wildlife Watching.
2. The Aquatic Mammals Working Group had chosen to present the emerging issue of Recreational In-Water Interactions to COP12 as a stand-alone document in order to highlight the specific threats and challenges caused by such activities to cetaceans. The working group acknowledged that in the future, consideration of this issue might be best combined with issues related to boat-based activities, given their many commonalities.
3. As requested in Decisions 12.51 a) and 12. 79 a) the Scientific Council at its 3<sup>rd</sup> Sessional Committee meeting in 2018 decided to combine the two work streams and refer to them as Marine Wildlife Watching.

### Decisions Relating to Recreational In-Water Interaction with Aquatic Mammals

4. At COP12, the Conference of the Parties adopted Decisions 12.50 to 12.52 on Recreational In-Water Interaction with Aquatic Mammals, as follows:

#### **12.50 Directed to the Parties**

*Parties are requested to provide the Secretariat with copies of the relevant documents for any measures as described in paragraph 1 of UNEP/CMS/Resolution 12.16 on Recreational In-Water Interaction with Aquatic Mammals they have adopted regarding recreational in-water interactions with aquatic mammals or other CMS-listed species.*

#### **12.51 Directed to the Scientific Council**

*The Scientific Council should:*

- a) *Consider combining workstreams related to recreational in-water interactions and boat-based wildlife watching in the coming intersessional period, ensuring all CMS-listed species that are the target of swim- or dive-with activities are covered by any guidelines to be developed;*
- b) *Review, subject to availability of resources, existing guidelines, good practice and underpinning scientific evidence of the issues of concern, and based on this review develop guidelines on recreational in-water interactions with CMS-listed species;*
- c) *Consult the International Whaling Commission (IWC) during the preparation of the guidelines and other documents;*
- d) *Report to the Standing Committee at its 48<sup>th</sup> and 49<sup>th</sup> meetings on the progress in implementing this decision;*
- e) *Present the guidelines and recommended code of conduct for operators concerning recreational in-water interaction to the 13<sup>th</sup> meeting of the Conference of the Parties for formal consideration;*
- f) *Consider, in the light of CMS Technical Series No. 33 Cetaceans of the Red Sea, launched at the 12<sup>th</sup> meeting of the Conference of the Parties, how best to take forward the conservation of cetaceans in the Red Sea region, taking into account all relevant threats, and report back on this to the 13<sup>th</sup> meeting of the Conference of the Parties.*

**12.52 Directed to the Secretariat**

*The Secretariat should:*

- a) *Transmit to the Scientific Council any documents on national measures adopted regarding recreational in-water interactions with aquatic mammals or other CMS-listed species submitted by Parties;*
- b) *Support the Scientific Council in the development of the guidelines on recreational in-water interactions.*

**Activities to implement Decisions 12.50 to 12.52**

5. Using funds made available by the Government of the Principality of Monaco under the Migratory Species Champion Programme, the Secretariat developed a review of existing guidelines, good practices and scientific evidence related to recreational in-water interactions with marine mammals, elasmobranchs and marine turtles, which is attached at Annex 2. It was made available for comments by the Scientific Council and its working groups on the Workspace.
6. As the inter-sessional period between COP12 and COP13 is approximately seven months shorter than usual, it has not yet been possible for the Scientific Council to undertake the next step and develop the related guidelines on recreational in-water interactions with CMS-listed species.

**Decisions Relating to Sustainable Boat-Based Marine Wildlife Watching**

7. At COP12, the Conference of the Parties adopted Decisions 12.78 to 12.81 on Sustainable Boat-Based Marine Wildlife Watching, as follows:

**12.78 Directed to the Parties**

*Parties are requested to provide the Secretariat with copies of the relevant documents for any measures they have adopted as described in paragraph 1 of UNEP/CMS/Resolution 11.29 (Rev.COP12) on Sustainable Boat-Based Marine Wildlife Watching.*

**12.79 Directed to the Scientific Council**

*The Scientific Council should, subject to availability of resources:*

- a) *Consider combining work streams related to boat-based wildlife watching and recreational in-water interactions with aquatic species in the coming intersessional period, collaborating with the International Whaling Commission (IWC) where appropriate, ensuring all CMS-listed species that are the target of recreational in-water interactions are covered by any guidelines to be developed;*
- b) *Collaborate with ACCOBAMS and the Standing Working Group on Whale Watching established under the Conservation Committee of the IWC to develop a joint IWC-CMS Whale Watching Handbook providing guidance to the Parties on management of activities related to vessel-based cetacean watching;*
- c) *Report to the Standing Committee at its 48<sup>th</sup> and 49<sup>th</sup> meetings on the progress in implementing this decision.*

**12.80 Directed to the Secretariat**

*The Secretariat should support Parties and the Scientific Council to provide comments and review drafts of the joint IWC-CMS Whale Watching Handbook.*

### Activities to implement Decisions 12.78 to 12.81

8. The Secretariat worked closely with the International Whaling Commission (IWC) to develop the joint IWC – CMS [Whale Watching Handbook](#), which was launched in October 2018. The Secretariat used funds made available by the Government of the Principality of Monaco under the Migratory Species Champion Programme to fund the translation of the handbook into the Convention languages.
9. The new Handbook is aimed at supporting the whale watching industry and regulators, as well as members of the public, to minimize adverse impacts on whale populations from these activities while assisting the communities that benefit from them to apply best practices.
10. During the development phase of the Handbook, the Secretariat ensured that the Scientific Council and its Aquatic Mammals Working Group had the opportunity to review the content of the draft. Several Councilors and working group members volunteered to provide comments and were consulted directly by the IWC Secretariat, as were ASCOBANS and ACCOBAMS.
11. The joint initiative by IWC and CMS has resulted in the [Whale Watching Handbook](#), an online resource which offers comprehensive and impartial advice. It also provides periodically updated country and species information, case studies, and management advice.
12. It includes over 100 pages of searchable, cross-indexed online content, and is divided into easily navigable sections according to user-type. Designed for use on mobile phones, tablets and desktop computers, the Handbook includes a variety of resources that can be downloaded. Key features include an interactive world map, which enables users to access information about whale watching in 25 featured countries. A section with annotated illustrations helps users learn more about individual species and identify them in the water. Species factsheets and a database of over 300 peer-reviewed articles provide in-depth content. As the Handbook is continuing to be updated, Parties and interested stakeholders are encouraged to send the Secretariat relevant case studies from their countries.

### Collaboration with IWC

13. Following from the success of the joint Whale Watching Handbook, at its 70th meeting in April/May 2018 (SC67b), the IWC Scientific Committee made the following recommendation:
 

*Given the substantial effort the Convention on Migratory Species (CMS) Secretariat has made in preparing several documents for the Committee to consider this year, the Committee:*

  - (1) **recommends** a continuation and an expansion of this exemplary collaboration between the IWC and CMS Secretariats and their various committees;
  - (2) **endorses** the intention of CMS to work with the IWC Scientific Committee on guidelines for in-water interactions with aquatic mammals and **offers** to provide the scientific underpinning for these guidelines;
  - (3) **agrees** that the Committee's intersessional correspondence group on swim-with-whales work intersessionally with the CMS Aquatic Mammals Working Group to develop draft guidelines; and
  - (4) **offers** to review draft guidelines when they are ready, with a view to **agreeing** a joint product of the IWC and CMS and hosted by both websites as a global resource.
14. The next IWC Commission meeting will be held in September 2020. At this meeting, the Commission will consider and agree next steps for these work areas, including the recommendations of its 2019 and 2020 Scientific Committee meetings.

Recommended Actions

15. The Conference of the Parties is recommended to:
- a). adopt the draft Decisions contained in Annex 1 of this document;
  - b). take note of the review: Recreational In-Water Interactions with Aquatic Species: Review of Existing Guidelines and Issues of Concern, contained in Annex 2.
  - c). delete Decisions 12.50 - 12.52 on Recreational In-Water Interactions and Decisions 12.78 – 12.80 on Sustainable Boat-Based Marine Wildlife Watching.

DRAFT DECISIONS

**MARINE WILDLIFE WATCHING**

***Directed to the Parties***

13.AA (12.50) Parties are requested to:

- a) provide the Secretariat with copies of the relevant documents for any measures as described in paragraph 1 of UNEP/CMS/Resolution 12.16 on Recreational In-Water Interaction with Aquatic Mammals that they have adopted regarding recreational in-water interactions with aquatic mammals or other CMS-listed species.
- (12.78) b) provide the Secretariat with copies of the relevant documents for any measures that they have adopted as described in paragraph 1 of UNEP/CMS/Resolution 11.29 (Rev.COP12) on Sustainable Boat-Based Marine Wildlife Watching.
- c) provide the Secretariat with country profiles for countries not already covered, or for suggestions for case studies for inclusion in the joint IWC-CMS Whale Watching Handbook.

***Directed to the Secretariat***

13.BB (12.52b) The Secretariat shall, subject to the availability of resources:

- a) support the Scientific Council in the development of the Guidelines on recreational in-water interactions-

***Directed to the Scientific Council***

13.CC The Scientific Council should, subject to availability of resources:

- a) utilizing the review of existing guidelines undertaken in partial fulfillment of Decision 12.51b<sup>1</sup> and presented to COP13, develop guidelines, including a recommended code of conduct for operators on recreational in-water interactions with CMS-listed species;
  - b) consult with the Secretariats and Advisory Committees, where appropriate, of the CMS MOUs dealing with aquatic species, in the development of these guidelines.
  - c) consult with the IWC Scientific Committee in the development of these guidelines and, if practical, consider agreeing a joint product, at least with respect to cetaceans.
- (12.51e) present the guidelines and recommended code of conduct for operators concerning recreational in-water interaction to the ~~43~~<sup>14</sup><sup>th</sup> meeting of the Conference of the Parties, for formal consideration.

<sup>1</sup> UNEP/CMS/COP13/Doc.26.2.5 Annex 2.

# Recreational in-water interactions with aquatic species

Review of existing guidelines and issues of concern

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## Introduction

Recreational in-water interactions (RIWIs) with charismatic aquatic species have evolved over the last few decades into widespread, popular and profitable industries across the globe. Significant socio-economical and conservation benefits for wildlife, ecosystems and associated communities have ensued, but scholars have also described and identified biological, ecological and social risks associated with such practices. The urge to limit the relentless expansion of the phenomenon, both through discouragement of new industries and strict regulations of the existing ones, has emerged. However, this can be a challenging task. No single solution exists that could accommodate, suit and adjust to the variety of modalities and characteristics of RIWIs with aquatic species recorded between and within countries and regions.

It is therefore recommended that management rely on robust scientific information on the specific context (biology and ecology of species, location, governance, history of the industry) to ensure maximum protection for the wildlife and safety for the human participants in the interaction. In an attempt to facilitate decision-makers, managers and stakeholders involved with the promotion, design, implementation and adoption of RIWI regulations, the Convention on Migratory Species, in collaboration with international partners, has resolved to review existing guidelines, good practices, scientific evidence and resources on RIWIs with aquatic species, including marine mammals, elasmobranchs and turtles. This information may support, at a later stage, the development of guidelines for selected CMS-listed taxa.

## Scope and purpose of this document

Decision 12.51b from the 12<sup>th</sup> CMS Conference of the Parties requested the Scientific Council to “review, subject to availability of resources, existing guidelines, good practice and underpinning scientific evidence of the issues of concern [i.e. *RIWI*], and based on this review develop guidelines on recreational in-water interactions with CMS-listed species”. It further directed to the Scientific Council to support the development of guidelines for selected CMS-listed taxa, and to the Parties, in whose areas of jurisdiction recreational in-water interactions with aquatic mammals take place, to adopt appropriate measures to address the consequences of, and carefully regulate, all such activities.

The present review does not systematically address species-, case- or nation-specific circumstances, as it is meant to provide a general overview of the existing guidelines, methods, challenges, and key aspects in mitigating impacts of RIWI activities and associated disturbances to marine mammal (cetaceans, pinnipeds, sirenians), elasmobranch (sharks and rays) and turtle populations.

## How to use this document

The document consists of two parts: **Part I** provides general considerations on recreational in-water interactions with aquatic species, and **Part II** presents taxa-specific considerations. Examples of regulations and guidelines, scientific evidence that confirms good practices or highlights issues of concerns, and recommendations for the aquatic species are included. An overview of available resources, as produced by international and regional organisations dealing with the issue, is also provided.

Scientists and decision makers are encouraged to consult the resources most relevant for their context (species, environment, socio-economic considerations, etc.) and use these as an inspiration to design regulations that best suit the local context. As the strategies, tools and quantitative thresholds reported in the document are based on species-specific or location-specific contexts, local environmental impact assessments are always encouraged to identify specific and locally relevant thresholds. When assessments cannot be conducted or the needed legal instruments are lacking, managers should be urged to adopt a precautionary approach based on the best available scientific evidence.

## PART I - General considerations on recreational in-water interactions

### 1. Introduction

Recreational in-water interactions (RIWI) with aquatic species are **tourism or recreational** activities occurring in **wild settings** and involving **in-water human interaction** with aquatic species. This document covers RIWI with **marine mammals, elasmobranchs and turtle** species, and provides data, reflections, and recommendations that apply to a **variety of activities** including, but not limited to, shark cage diving, swimming with dolphins and snorkelling with turtles and dugongs at numerous locations worldwide. Interactions carried out for commercial purposes other than tourism (e.g. collection of 'aquatic bushmeat') or in captive and semi-captive facilities (e.g. dolphinarium interaction programmes, dolphin-assisted therapy) are **not** addressed in this document.

In-water interactions with marine mammals, sharks, rays and turtles have seen a dramatic increase since the 1990s. Recent inventories of RIWI activities have attempted to describe the extensive and growing reach of the phenomenon (Dearden et al. 2008; O'Malley et al. 2013; Cisneros-Montemayor et al. 2013; Aquatic Mammals Working Group of the Scientific Council 2017; International Whaling Commission & Convention on the Conservation of Migratory Species of Wild Animals 2019). Its current actual extent is probably severely underestimated, due to difficulties in chronicling all sites and situations (Samuels et al. 2003), the fact that assessments are usually conducted on tours with some commercial basis (Garrod & Fennell 2004), and that new RIWI operations are continually appearing at new locations.

RIWI activities can establish themselves rapidly and solidly at locations where the following three conditions are satisfied:

- The target aquatic species can be predictably and/or frequently encountered;
- The species' behaviour makes it accessible or easily approachable/observable in the water;
- The site and timing of interactions are logistically suitable to provide a satisfactory and safe experience to the human participants (e.g. accessible site in an accessible region, sheltered waters, good visibility, suitable time of the day).

A suite of natural and anthropic factors helps define the specific characteristics of each in-water encounter and produce the variety of RIWI activities recorded worldwide. Depending on the species' behaviour, the morphology of the site, existing regulations and tourism industry at the site, among others, interactions can occur in shallow or deep waters, in inshore or offshore sites, at specific times of the year or year-round. Activities can be shore-based (participants enter the water from land) or use powered or non-powered platforms to reach the site of interaction and approach the targeted wildlife species. The interaction can occur at the surface (snorkelling, swimming) or at depth (free diving, SCUBA diving), and can be prompted using food, lures or visual attractants. Swimmers and snorkellers may be allowed to swim freely, or their movements might be assisted or restricted. Voluntary or mandatory codes of conduct may be in place to regulate the behaviour of human participants.

### 2. Benefits and risks

Interacting with wild animals in wild settings has been associated with a number of benefits for the human participants, the broader engaged communities and the wild individual animals, populations or species targeted (Higginbottom et al. 2001; Orams 2002; Zeppel & Muloin 2007, 2008). In-water encounters with marine mammals not only improve **physical and spiritual wellbeing** in the human

participants (Bentrupperbäumer 2005; Curtin 2006), but also provide **socio-economic benefits** to local communities, **enhance public awareness of species and environmental conservation, incentive stewardship and ownership of natural resources, promote scientific research and conservation opportunities, and offer viable alternatives to contentious extractive uses** (Aquatic Mammals Working Group of the Scientific Council 2017). The growth in popularity of shark diving has had a major role in dispelling myths and preconceptions about the species (Gallagher & Huveneers 2018) and in replacing consumptive uses (Wilson & Tisdell 2001; Topelko & Dearden 2005; Cisneros-Montemayor et al. 2013). As a result, new narratives have been introduced, enabling schemes for the conservation of the species. Furthermore, by providing resources (e.g. food), tourists can increase the energy animals can allocate to other activities, such as reproduction and resting, and have direct fitness benefits (Orams 2002). RIWIs have therefore a real potential to become valuable, profitable and desirable activities, provided that these outcomes are linked in positive feedback loops (Aquatic Mammals Working Group of the Scientific Council 2017).

Otherwise, as wildlife-oriented activities, RIWIs can grow to the point of violating the ecological and social carrying capacity of the region, the ecosystems and the habitats in which they take place (Dearden et al. 2008). The main objections to RIWI are both biocentric and anthropocentric and refer to its effects on a) animal welfare, b) population conservation, c) broader ecological processes, and d) human safety.

#### a) Animal Welfare

“Animal welfare is the physical and psychological state of an animal as regards its attempt to cope with its environment” as defined by Broom (reported in World Society for the Protection of Animals 2000). In this definition, “coping” is intended to mean the ability of an animal to keep performing its natural behaviour, despite and regardless of the disturbance caused by external stimuli. When the stress goes beyond the animal’s ability to maintain its natural behaviour, welfare concerns are legitimate.

The assessment of animal welfare draws from the study of animal behaviour and physiology. However, responses are non-ubiquitous and change within and between species, populations and even individuals, hence their assessment, quantification and interpretation can be challenging (Knight & Cole 1995).

In general terms, individuals faced with stimuli that inflict suffering, disturbance, disruption and/or distress may adopt a fight or flight response. In aquatic species, this manifests in **vertical or horizontal avoidance** (e.g. changes in swim speed, increased dive or surface intervals, erratic movements. Gallagher et al. 2015; Machernis et al. 2018) and/or in **biochemical, physiological and histological indicators** (Semeniuk et al. 2009; Atkinson et al. 2015; Huggett 2018), biomarkers not easily detectable in free ranging animals. In the case of chronic exposure to disturbances, responses may change over time as **sensitisation, tolerance or habituation** to the stimuli develop (Bejder et al. 2009) or as animals opt to more definitive, **longer-term responses** (e.g. displacement to alternative locations. Lusseau 2005).

RIWI operations launched from motorized vessels also carry the risk to directly injury wild animals, for instance through **collisions** and **acoustic pollution**.

RIWI operations including **food provisioning** pose the risks associated with the practice of feeding wildlife in tourism contexts, including increased wildlife stress, rates of injury, pathogen prevalence, or malnutrition (Murray et al. 2016), alteration of natural behaviour (Orams 2002), increased aggression (Alves et al. 2013) and changes in residence patterns and home range size (Clua et al. 2010; Gallagher & Huveneers 2018).

## b) Conservation issues

Human activities hampering an animal's performances in behaviours of survival importance (e.g. feeding, defence, nursing, mating) can lead to decreased individual survival and/or reproductive rates, and eventually endanger the wellbeing of the population and the species. This may occur with the direct interruption and disruption of a critical behaviour, or indirectly, through the imposition of excessive demands on the energetic and behavioural budget of the individual resulting in reduced performances.

Cetacean-based activities (boat-based watching, swim-with) have been associated with population decline (Bejder et al. 2006; Filby et al. 2014), a discovery that prompted their redefinition as non-lethal consumptive activities, rather than non-consumptive (Higham et al. 2016). Already in 1992, Shackley (1992) cautioned that human-manatee interactions could be perhaps the “final nail in the manatee’s coffin”, hence highlighting the conservation threat posed by these activities.

The indicators employed in assessing the conservation status of a population or species are demographic measures of **survival rate, reproductive rate, and population size**. However, in most cases, the **lack of historical, robust, scientific dataset** and of **ideal experimental conditions** (e.g. availability of control sites and control data), together with **difficulties in disentangling the specific effects of RIWI from those of other co-existing threats** faced by the populations (food provisioning, interactions with fisheries, marine pollution, intentional catches, etc.) as well as the **effects of natural environmental variables** (prey-predator dynamics, population dynamics, structure and sociality, etc.) can prevent the conclusive assessment of whether, how and to what extent RIWI activities do have an impact on individual and population fitness.

## c) Ecological processes

As consumers at various trophic levels, competitors, predators and prey, **the fate of marine mammal, elasmobranch, and turtle populations is strongly interwoven with that of all directly, and indirectly, related aquatic communities**. Fluctuations in species occurrence and abundance can affect and be affected by top-down and bottom-up processes in food webs and trophic cascades and by other species' population abundance, and can lead to changes in community composition (e.g. Essington 2006; Heithaus et al. 2008; Burkholder et al. 2013).

Furthermore, **human activities also directly alter processes** at broader scales. Food provisioning can affect behaviour, habitat use, and residency of focal shark species and non-focal species (Gallagher & Huveneers 2018), generate increased nitrogenous wastes that can influence benthic communities (Lawrence et al. 2016) and ultimately modify trophic cascade and species assemblage (Ilarri et al. 2008; Wen et al. 2019). Boating and coastal tourism development causes habitat loss and destruction, pollution, noise and physical and chemical damage, thus causing additional detriment to both the species and the larger ecosystems.

## d) Human safety

RIWI with large, aquatic species can result in **injury and harm** to the human participants. This has been reported for marine mammals, mainly for interactions involving solitary sociable dolphins (Webb 1978; Shane et al. 1993; Wilson 1994; Orams et al. 1996; Santos 1997; Seideman 1997; Christie 1998; Samuels et al. 2003). The [International Shark Attack File \(ISAF\)](#) (Florida Museum of Natural History n.d., consulted on 28 May 2019) reports that 33 species of shark are implicated in 828 confirmed unprovoked attacks investigated by the organisation, whose database includes reports from the mid-

16th century. The majority of human victims were engaging in recreational activities on the surface (e.g. surf, water skiing, windsurfing, boogie boarding, rafting) or were swimmers and bathers at the time of the attack (Source ISAF). More than half of the incidents until 2016 took place in Florida or Australia, followed by Hawaii (9 per cent) (Source ISAF).

Participants in RIWI are also exposed to the **intrinsic dangers of swimming, snorkelling and diving**. These can be further exacerbated if the interactions occur in open waters, involve large crowds, are undertaken by inexperienced participants, led by uncertified or unspecialized guides, and/or employ motorized vessels for leap-frogging (i.e. dropping people in the water close to targeted animals) (Aquatic Mammals Working Group of the Scientific Council 2017).

### 3. Challenges and solutions

As the popularity of interacting with aquatic species in their natural environments increases, managers and decision-makers are charged with the challenge of regulating the activity to allow tourist and recreational fruition, while simultaneously ensuring protection of the target wildlife and the human participants. However, **knowledge gaps, poor management frameworks, and lack of enforcement and implementation of best practices** are recurring issues hampering sustainable management of marine wildlife tourism (Trave et al. 2017). "As is the case with most aquatic mammal/human interactions, the demand and growth of [the in-water interaction] industry has significantly outstripped the ability of scientists to develop and implement sufficiently sensitive tools that might provide some sound basis for management decisions" (Gales 1999, reported in Samuels et al. 2003). Two decades later, Gales' statement still holds true and probably applies to the aquatic taxa treated in this review.

A growing interest in the topic has led to important reflections on the implications of the RIWI phenomenon and on the challenges of investigating it. One crucial point that emerged is the **intrinsic uncertainty and complexity** of impact assessments. It has become clear that the natural sciences can only on a few occasions aim to fully understand the biological implication of RIWI on wild populations, and to quantitatively demonstrate its effects (or lack of). Unless researchers can count on solid species and/or population baseline knowledge, long-term historical datasets, control sites, before/during/after impact data, and valid quantifiable indicators, a deal of uncertainty in impact assessment studies may be unavoidable. Impacts could remain undetected because they manifest elsewhere (e.g. migratory species), will manifest only in the future, in individuals not available for sampling, or are masked and mixed with those of other phenomena (both natural and anthropogenic). Equally complex is the identification of management, implementation and enforcement approaches and initiatives most likely to succeed in a given scenario, as this requires advanced understanding of relevant social, cultural, economic and governance aspects.

Currently, and for all the aquatic taxa treated in this document, strong indication exists that **in-water interactions can have detrimental effects on the target species**, especially when they are poorly managed, or not managed at all. Following the harm to a population or a species, already a dramatic event, serious socio-economical repercussion on the RIWI industry must be anticipated. As described in Duffus and Dearden (Duffus & Dearden 1990), when a tourism activity develops to irrevocably compromise the target species or habitat, the activity itself may disappear altogether at the site, or have to shift its attention to other local resources.

Agreed that such dramatic consequences are unsuitable, scholars and organizations are advocating for a development of new, robust scientific approaches to predict impacts, for the adoption of precautionary principle in the management of interaction with aquatic species and for a shift in the burden of proof (Bejder et al. 2006; Aquatic Mammals Working Group of the Scientific Council 2017; International Whaling Commission 2018)

- **Devise new scientific approaches** to deal with uncertainty and data-deficient populations. It is recommended to:
  - \* Explore the use of advanced, robust modelling techniques to predict long-term scenarios on the basis of the short-term responses observed and measured in the field (e.g. Modelling and Assessment of Whale Watching Impacts (MAWI) initiative with the International Whaling Commission for marine mammals. New et al. 2012, 2015; Christiansen & Lusseau 2015). Alongside innovative analytical thinking and techniques, the use of modern technologies can inform and provide new perspectives and tools for the study of animal behaviour and their conservation (Nowacek et al. 2016).
  - \* Develop frameworks including both welfare and conservation aspects. As welfare discourses resonate well with the community of users, and conservation traditionally informs management, the integration of both aspects could be ideal for management (Papastavrou et al. 2017).
  - \* Monitor and investigate best practice for the achievement of beneficial outcomes (e.g. education, conservation attitudes, local economies improvement) and investigate aspects of the human dimension of interactions (e.g. factors leading to interaction, dictating its nature, short- and long-term effects on knowledge and attitude, the role of education and communication. Manfredo et al. 1995) to adapt management initiatives.
  - \* Learn from, and collaborate with, scholars investigating different types and aspects of marine wildlife and wildlife-based tourism, as well as animal welfare. This may prove beneficial not only to advance knowledge in each specific field, but also to identify shared factors of concern, and to examine their implications for sustainability in the broader perspective (Trave et al. 2017).
- **Apply the precautionary principle** to protect populations, species and ecosystems from harm that is scientifically plausible, even if not yet verified, because taking action once harm is evident is typically too late (Fennell & Ebert 2004). A precautionary approach facilitates decision-making, and ensures that action and decision-making processes are not stopped by a lack of certainty or of scientific information (Hoyt 2005).
- **Shift the burden of proof** on the tourism industry and allow operations only if scientific evidence can be provided that they do **not** cause unacceptable impact the target animal(s), population(s) and habitat(s). Currently, RIWI operations are typically permitted, unless their negative effects on the wild population is scientifically proven. The question as to when, where, and under what circumstances RIWI operations should not occur at all must be raised (Corkeron 2004; Bejder et al. 2006 for cetacean-based tourism).

#### 4. Overview of management strategies and tools

Any management plan aimed to regulating RIWI activities should be **tailored to the local settings**, and **adaptive** to allow adjustment to changing conditions. Although general guidelines exist, there is no panacea, and plans must strive to suit the local, specific situation and context. Information on the target species' life history traits, behaviour, population status, habitat use, ecosystem role and

conservation threats should be collected on site or, when this is not possible, from the relevant scientific literature. Likewise, information on the local tourist market, tourism carrying capacity, marine-based and wildlife tourism industries, local community attitudes, stakeholders profile and applicable legal regulations should be compiled. Once these are available, strategies and tools representing the best **compromise between minimizing impacts and ensuring profitability in the specific circumstances** can be identified. This includes the **involvement of local stakeholders**, promoted through awareness and education efforts, and with their direct engagement and commitment to compliance and enforcement, to ease the implementation of management measures.

Management also needs to be adaptive in order to respond to natural and induced changes in the environment, in tourists' numbers and specialization, in operator behaviour, and in the target wildlife population and habitat. This implies a degree of flexibility in the regulations and, especially, an efficient and accurate monitoring of conditions to allow timely detection of condition change, and to inform revised regulations. **Frameworks** incorporating both the social and the ecological aspects of human-nature interactions can be particularly useful. Ostrom's social-ecological system (Ostrom 2009) and the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES) framework (Díaz et al. 2015) are relatively general and adaptable tools that can be tailored to a range of coupled human-nature phenomena. Other frameworks are more specific to wildlife tourism (e.g. Duffus & Dearden 1990; Orams 1996; Reynolds & Braithwaite 2001; Miller et al. 2014) and even to specific marine wildlife tourism (e.g. Higham et al. 2009 for whalewatching, Trave et al. 2017).

Managers urged to devise interventions to regulate RIWI activities will find that a number of general, international and national guidelines and recommendations are available. A review of management strategies and tools, and a number of case studies regarding marine mammals are described in the Whale Watching Handbook (International Whaling Commission & Convention on the Conservation of Migratory Species of Wild Animals 2019) and in Carlson's reviews (Carlson 2009, 2011, 2012), and for elasmobranchs in Lawrence et al. (2016) and Dearden et al. (2008), as well as in Tapper (2006), among others.

A summary of the main strategies and tools (as identified in the Whale Watching Handbook) applicable to all taxa, is provided below.

## Strategies

- **Voluntary codes of conduct:** often prepared and distributed by local organizations and groups, codes of conduct aim to promote best practices when interacting with aquatic species, including guidelines on how vessels and human participants should approach and behave around aquatic species.
- **Legally enforced regulations:** formalized in local or national laws, compliance to these regulations is monitored and enforced by a local authority, often a government body. Lack of compliance is punished (monetary or administrative sanctions, such as the payment of a fine, or the loss of a licence) with sanctions described in the relative laws.
- **High quality labelling/licensing schemes:** administered by various organizations and agencies, labelling and certification can be used to either control the number of commercial operators active in an area, and to identify operators committed to excellence in sustainable interaction with aquatic species.

These strategies are not mutually exclusive, and it is not uncommon for regulations initially promoted in a code of conduct to evolve, in time, into more formal regulations. The three strategies, however, differ in feasibility and, arguably, effectiveness. Studies indicate that formal, legal, enforced

regulations with sanctions for infractions most likely result in higher compliance (Allen et al. 2007; Wiley et al. 2008). This may be especially true in volatile economies, where operators may disregard guidelines to secure higher immediate profits (Lawrence et al. 2016). When guidelines are responsibly followed by tour operators and participants, the interaction is not only less harmful to wild animals, but also more enjoyable (closer, longer lasting) for participants (see Machernis et al. 2018).

## Tools

- **Approach guidelines** define the number of vessel/people allowed to approach wildlife, the speed of the approach, the minimum distances to be kept between swimmers or platforms and the wildlife, behaviours to observe (touching, style of swimming, etc.), instructions for the use of attractants, and for the use of equipment (SCUBA, photographic equipment, etc.). NOAA's issued general **Marine wildlife viewing guidelines** through the Ocean Etiquette programme and **Viewing Guidelines** for mammals and turtles indicating the following as generally recommended:
  - Do not feed, or attempt to feed marine mammals. It is harmful and illegal.
  - Do not swim with, ride, pet, touch, or attempt to interact with marine mammals or sea turtles in the wild.
  - Do not chase and harass (surround or trap an animal, block its escape route, come between mother and young or separate individuals from a group).
  - Provide visitors with information on the wildlife, the site of interaction and regulations in place before the interaction.

Species-specific **guidelines for boat-based wildlife watching** (CMS Secretariat 2017) should be consulted to minimize disturbance caused by platform-based RIWI operations.

- **Permitting or licensing operations** helps to set a standard of quality. The award of a permit or licence may be subject to one or more of the following requirements: minimum qualification and standards for a tourist operation (e.g. Global Sustainable Tourism Council; International Organization for Standardization), research involvement, operator and crew training and qualification, expectations for educational interpretation. Schemes may be used to control the number of commercial operators active in an area (pre-established number of quotas or permits issued), their operations (e.g. areas, frequency, schedule, multiple approaches, approaches to the same group of animals) and compliance to guidelines. Examples of national and regional accreditation systems include [UNEP Green Fins](#) and [NOAA's Ocean Etiquette](#) programmes.
- **Place-based tools**
  - \* **Zoning and time/area closures** are effective for regulating, limiting or banning interactions in specific portions of habitat that are essential to individual survival and population health (critical habitats) (Higham & Lusseau 2007; Hoyt 2012; Tyne et al. 2014). When wild populations are spatially (i.e. relying on a specific habitat for a specific function or behaviour) or temporally (i.e. able to carry out the function or behaviour only at certain times) constrained in their activities, area and time closures are, respectively, sensible management options (Lusseau 2014). The design of adequate and effective closure plans requires a baseline knowledge on the species' and population's ecology and behaviour, as well as dedicated studies to identify critical habitats (e.g. foraging, resting, calving) and the time of their use. Recommendations and approaches in Higham and Lusseau (2007), Tyne et al. (2014) and Ross et al. (2011), among others, can be useful in this context.

- \* A **protected area** is a “clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values (Day et al. 2012). Such areas are set up to protect vulnerable species and ecosystems, preserve biodiversity, segregate uses to avoid user conflicts, and enhance the productivity of species’ populations within and outside the area (Hoyt 2018). Besides ensuring protection of an important area (including its natural and cultural resources), they have a legal status and can ease the implementation of monitoring and enforcement, as well as provide a source of income through the collection of fees.

It must be highlighted that the nomenclature and definition of marine protected areas varies in different countries, and even within the same country (e.g. marine park, marine reserve, closed area, marine sanctuary, nature reserve, ecological reserve, national marine park, marine conservation area) (Hoyt 2005; Day et al. 2012). Similarly vague is the definition of “sanctuary”, a term widely employed worldwide (Hoyt 2005).

- **Enforcement** of regulations includes the patrolling, controlling and monitoring of participants’ compliance to regulations, and the issuing of sanctions in case of violations. Enforcement duties can be entrusted to government and non-governmental agencies and organizations, to trained members of the community (rangers, wardens) or to operators themselves (self-monitoring). Modern technologies (e.g. e-logbooks, AIS position data, cameras. Day et al. 2012; Lawrence et al. 2016), and innovative enforcement methods (e.g. ‘secret shoppers’. Lawrence et al. 2016) can help overcome intrinsic difficulties in enforcement and management in marine environments.
- **Benefit sharing** and **capacity building** can help mitigate conflicts between stakeholders in areas where protection measures affect the activities and the livelihood of local communities. Side payments from tourist operators or tourists, for instance, can be an option to compensate the adjacent fishing communities for the inability to fish at a specific site (Cisneros-Montemayor et al. 2013; Lawrence et al. 2016). While measures for the protection of wildlife are designed, it is advisable to set up programmes to guide and enable local stakeholders to transition from consumptive uses to sustainable tourism, where adequate and advisable. Capacity-building and training can include aspects of marketing strategies, customer service, and animal welfare guidelines (Cisneros-Montemayor et al. 2013), as well as technical skills (e.g. SCUBA diving, foreign languages).

As the “presence of regulations does not guarantee compliance, especially when tourists receive conflicting messages” (Dearden et al. 2008) it is recommended to invest in education and interpretation efforts targeting all those directly involved in the activity (operators, tourists, privates, managers and enforcing agencies). Programmes such as the Communication, Education and Public Awareness (CEPA) of the Convention on Biological Diversity (CBD) and the Ramsar Convention on Wetlands, and the instruments created through the CMS Outreach and Communication Plan (UNEP/CMS Secretariat 2014) may provide Member States with useful recommendations and resources.

- **Performance review** allows the assessment of the progress and the success of a management plan and regulations in meeting their ecological and socio-economic objectives. Quantitative thresholds (Limits of Acceptable Change, Carrying Capacity, early warning signs) to monitor the status of wild individuals and populations should be identified as soon as possible, and incorporated in adaptive management plans (e.g. Duffus & Dearden 1990; Higham et al. 2009). The assessment of strengths and weaknesses in efficiency, customer

experience, safety standards, and contribution to local community should be carried out regularly to ensure best standard of practices and stakeholders' support and satisfaction with the management measures. Relevant resources include Pomeroy et al. (2004), Hockings et al. (2006) and Day et al. (2012).

## PART II - In-water interactions by taxon

### Marine Mammals

#### Introduction

Marine mammals are long-lived, slow-breeding, social animals. The taxon includes cetaceans (mysticetes and odontocetes), sirenians (dugongs and manatees), pinnipeds (otariids, walruses and seals), polar bears and sea otters. At least 28 species of dolphin and whale (22 of which are listed in the CMS Appendices), 9 species of pinniped (2 listed in the CMS Appendices) and 2 species of sirenian (both CMS-listed) are targeted by RIWI activities in at least 115 documented locations in the world (Aquatic Mammals Working Group of the Scientific Council 2017). A most recent and extensive review of the phenomenon of RIWI targeting marine mammals is provided in the briefing “Recreational in-water interaction with aquatic mammals” presented at the 12<sup>th</sup> Meeting of the Conference of the Parties (Aquatic Mammals Working Group of the Scientific Council 2017).

#### Indicators of disturbance

The works of Samuels, Bejder and colleagues (Bejder & Samuels 2003; Samuels et al. 2003) are key references in the context of the understanding, assessment and management of RIWI, and were recently updated and complemented in the review work of Machernis and colleagues (2018), and of Nunny and Simmonds (2019) for the case of solitary-social dolphins. The series “Recent advances in whale-watching research” and associated documents regularly issued by the Whale Watching subgroup of the IWC Scientific Committee are also relevant resources.

**Cetaceans.** Mysticetes and odontocetes respond to interaction and approaches with short-term behavioural changes (Senigaglia et al. 2016; Machernis et al. 2018).

The manifestation of avoidance tactics (changes in swim speed, direction, or movement patterns) and changes in surface activity depend on operation procedures and swimmers’ behaviour, and cetacean group characteristics, among other factors. In particular, works cited in Machernis et al. (2018) showed that

- individuals engaging in resting, feeding and nursing are more likely to interrupt the behaviour and shift to travelling and milling;
- swimmer placement parallel to the path of the animal(s), calm quiet approaches, and observance of regulation cause less avoidance behaviour. ‘In path’ placement and splashing swimmers triggered the highest rates of avoidance;
- the response of animals may change from initial engagement and neutrality, to avoidance as the RIWI extends in time;
- mother-calf pairs and small group sizes are less likely to initiate or sustain an interaction, as opposed to younger age classes and larger group sizes.

**Sirenians.** West Indian manatees curtail resting, foraging and nursing in favour of milling behaviour (King & Heinen 2004), and may flee to other areas (reported in Bearzi 2017) in the presence of

swimmers and boats. Watercraft heavily affect manatees both directly (disturbance, lethal and non-lethal injury) and indirectly (e.g. effects of increased turbidity on sea grasses. Reynolds et al. 2018). High densities of tourists and site-overcrowding are major contributors to disturbance (Sorice et al. 2006). The constant presence of recreational activities could cause manatees to avoid key habitats, with possible negative consequences on individual survival (Reynolds et al. 2018). Mother-calf separation could also increase perinatal mortality rates (Reynolds et al. 2018).

Recreational activities are listed as a threat to the dugong, but the occurrence, characteristics and severity of their impacts on the species remain largely unknown (Marsh & Sobotzick 2015). A few studies show that the species would interrupt feeding when closely approached by boats in highly trafficked areas (Hodgson & Marsh 2007), and is disturbed by boats travelling at higher speeds (reported in Nasr et al. 2019).

**Pinnipeds.** Pinniped-based tourism can lead to changes in behaviour, site abandonment, stampeding, disturbance to suckling bouts and reduced reproductive rates (Cowling et al. 2014). However, little information is available on pinnipeds' responses to in-water interaction. Australian fur seals haul out in the presence of several swimmers, but interaction increased as the number of swimmers increased (Stafford-Bell et al. 2012). New Zealand fur seals mostly ignored the swimmers in the water, and the occurrence of interaction was related to the duration of the approach (peaking a few minutes into the swim, then declining), the seals' age (with juveniles most likely to interact) and the season (mainly in the pupping season, when juveniles spend most time in the water) (Cowling et al. 2014). Seals' avoidance responses were more often elicited by independent swims (as opposed to commercial) and by larger swimmer groups (Boren et al. 2008). An analysis of South American sea lions indicate that, while sea lions can demonstrate interest and engagement in the swims, they may bite the swimmer after being touched, or after touching the swimmer with their nose (Dans et al. 2017). California sea lions in Mexico were found particularly sensitive to noise generated by motorized vessels, tourists and SCUBA equipment within 20m from the rookery (Labrada-Martagón et al. 2005).

Over time, individuals and populations chronically exposed to interaction can adopt new, more adaptive response strategies. Individuals repeatedly facing a disturbance can develop **sensitization, tolerance or habituation** to it, the three being complex, subtle phenomena to describe and identify, yet fundamental to correctly understand and interpret field observations (Bejder et al. 2009). **True habituation** (i.e. lack of response to stimuli perceived as non-threatening) can be beneficial in reducing stress and energetic expenditure (Groves & Thompson 1970), but entails an alteration of natural behaviours that may reduce long-term survival (Boren et al. 2002). Bejder and colleagues (2009) highlight that **habituation-type responses** (i.e. reduced responsiveness) may have other, physiological or ecological, explanations and that they cannot, and should not, be taken to indicate that individuals are unaffected by the disturbance, nor that the disturbance does not have detrimental effects.

When suitable, adjacent habitats are available, individuals may modify their distribution, ranging and residence patterns. The costs of these adjustments and coping mechanisms may become evident in individual health, reproductive success, or performances in survival functions (e.g. feeding, hunting, defence, social interactions) and, eventually, at the population-level (Samuels et al. 2003; Machernis et al. 2018).

## Specific issues of concern and risk related to the activity

**Food provisioning** (legal or illegal) is reported on the common bottlenose dolphin (*Tursiops truncatus*) in USA, Indo-Pacific bottlenose dolphin (*Tursiops aduncus*) and humpback dolphin (*Sousa sahulensis*) in Australia, on the Amazon river dolphin (*Inia geoffrensis*) and tucuxi (*Sotalia fuviatilis*). Age and sex characteristics of conditioned dolphins vary among locations, but males and sub-adults are the classes most likely to be involved. Since males can become particularly aggressive during provisioning, and calves and juveniles experience high mortality rates (Anderson 1994; Mann & Kemps 2003; Foroughirad & Mann 2013; Senigaglia et al. 2019), management plans may allow the activity only on adult and sub-adult females (e.g. in Monkey Mia, Australia).

The practice can alter individual behaviours, including spatial patterns (Samuels & Bejder 2004; Finn et al. 2008), socially learned, unnatural, risky behaviours. (Donaldson et al. 2012) and decreased foraging, nurturing and socializing, leading to increased injury and mortality (Mann & Kemps 2003; Samuels & Bejder 2004; Donaldson et al. 2010; Foroughirad & Mann 2013; Christiansen et al. 2016; Senigaglia et al. 2019). It is therefore considered potentially harmful to dolphins. The specific effects of the practice, however, may remain poorly understood as their are interwoven with those of other features of the food provisioning process and the in-water interaction (Samuels & Bejder 2004; Cunningham-Smith et al. 2006).

Humans illegally feeding dolphins are at higher risk of injuries (e.g. bites) and disease transmission (Samuels & Bejder 2004).

**Interactions with solitary social dolphins.** The term ‘solitary-sociable dolphin’ is used to describe “cetaceans that have little or no contact with conspecifics and who regularly closely approach humans, often including touch, social, sexual, and play behaviours” (Wilke et al. 2005). The vast majority of solitary-sociable animals are bottlenose dolphins (mainly *Tursiops truncatus*). An updated review of instances, implications, and consequences of interactions with solitary-sociable dolphins has been recently compiled by Nunny and Simmonds (2019).

Interactions (boat-based and in-water) with solitary-sociable animals can negatively affect their welfare by altering behavioural patterns (e.g. interrupting feeding, food provisioning), causing injuries due to malpractices (e.g. objects forced in blowhole, touching, riding, intentional injury) and increased proximity to human activities (e.g. entanglements, boat strikes) and coastal areas (e.g. stranding) (see reviews in Samuels et al. 2003; Nunny & Simmonds 2019).

Risks to human participants can also be significant, and include direct aggressive, dominance and sexual behaviour, and are often triggered by inappropriate human practices (Samuels et al. 2003; Wilke et al. 2005; Nunny & Simmonds 2019). Management of interactions with solitary animals must be designed to take into account factors such as the sex, age, personality, stage of sociability and home range of the dolphin, as these will inform what management options are required, possible and most effective (Wilke et al. 2005).

## General Recommendations

- **Discourage the establishment of new RIWI** operations and the further development of in-water interaction programmes until there is scientific evidence that supports allowing it; where already established, allow it under strict regulations (ACCOBAMS Scientific Committee 2007; Convention on Migratory Species 2017; International Whaling Commission 2018; IWC Sub-Committee on Whale Watching 2018).
- **Prioritize the identification and protection of most critical areas** (e.g. resting, nursing, feeding, wintering), **times** (e.g. season, time of day, life history) and **units** (vulnerable and

endangered species or populations, mother-calf pairs, solitary-sociable dolphins) with adequate strategies and tools.

- **Allow only active RIWI** (i.e. initiated and engaged by animals), as opposed to passive (initiated by humans). This can include prohibition of chasing and leapfrogging, and regulations on swimmer numbers, placement and movements, among others.

### Existing guidelines and resources

The legal status and regulations governing in-water interaction with aquatic mammals vary greatly across the world, and, in many regions, there is little consistency in approaches, with management being often *ad hoc* or missing altogether (Aquatic Mammals Working Group of the Scientific Council 2017). In many cases, in-water interactions are treated and managed as a component of whale watching activities, in other cases they may be addressed with specific guidelines and recommendations. Some whale watching guidelines prohibit swimming with the animals (e.g. South Africa, NOAA Dolphin SMART Programme), others allow it commercially and only under specific conditions (e.g. Australia, New Zealand) (Garrod & Fennell 2004; Carlson 2012).

- **Legislative framework**, including relevant regional and national governmental laws and regulations on recreational in-water interaction, marine mammal watching, as well as wildlife protection and harassment (see Carlson 2012), may apply.
- **Existing general RIWI guidelines and regulations** issued by governmental and non-governmental agencies and organizations:

- **Cetaceans:**

Guidelines often include regulations on

- Drop-off and swimmer distances (often set at 30m).
- Swimmer behaviour: no touching, feeding, riding, petting, or free diving. If approached by a whale or dolphin, move slowly to avoid startling the animal and do not swim towards it.
- Use of equipment: no SCUBA, underwater flash photography, motorized diving or swimming aid.
- Swim management: maximum number of swimmers per swim, swimmers:guide ratio, use of lines, maximum interaction time, maximum number of attempts allowed, frequency of approaches, maximum distance from the supporting vessel.
- Supporting vessel procedures: no repositioning during the swim, leapfrogging or towing swimmers, idled engine, observance of best practices in approach, swimmer pick-up and departure.
- No-swim situations: surface-active whales, presence of calves and newborn calves, no-approach times (e.g. rest period).

### Useful resources

- [Whale Watching Handbook](#) (International Whaling Commission & Convention on the Conservation of Migratory Species of Wild Animals 2019)
- Review of guidelines and regulations (Carlson 2012)
- [International Whaling Commission guidelines](#) (International Whaling Commission 2018)
- Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and contiguous Atlantic Area guidelines and policy (ACCOBAMS 2004; ACCOBAMS Scientific Committee 2018)

- [Regional Activity Centre for Specially Protected Areas and Wildlife in the Wider Caribbean Region](#) (SPAW RAC) (Caribbean Environmental Programme & UNEP CAR/RCU 2016)
- [Indian Ocean Rim Association](#) (IORA) Sustainable Whale and Dolphin Watching Tourism Network
- Secretariat of the Pacific Regional Environment Programme (SPREP)
- Whale and Dolphin Conservation (Ludewig & Williams-Grey 2019)
- Humane Society International (Hoyt 2007)
- International Fund for Animal Welfare (IFAW et al. 2008)
- [Dolphin SMART](#)
- [Whale Sense](#)
- [World Cetacean Alliance](#) (Lewis & Walker 2018)

- **Sirenians:**

Guidelines often include regulations on

- Swimmer behaviour: no touching, feeding, or diving; avoid noise and splashing; do not pursue or chase.
- Use of equipment: prefer snorkelling to SCUBA diving
- Supporting vessel procedures: do not chase, isolate or single out an individual manatee from its group, or separate a mother and her calf.

Useful resources

- [US Marine Mammal Commission](#)
- [Florida Manatee Programme](#)
- [UNEP Dugong, Seagrass and Coastal Communities Initiative](#)
- [Dugong and Seagrass Conservation Project](#)
- Vanuatu Environmental Science Society (Vanuatu Environmental Science Society n.d.)
- [Ningaloo Marine Park - Information for visitors](#)

- **Pinnipeds:** existing codes of conduct mainly regulate on-land and boat approaches. In-water interactions are often discouraged or not discussed (Öqvist et al. 2018).

- **Scientific research for impact assessment, monitoring and management**, including available frameworks and recommendations for identification of critical areas and units (Wilke et al. 2005; Higham & Lusseau 2007; Ross et al. 2011; Avila et al. 2018), socio-ecological investigation and adaptive management (Duffus & Dearden 1990; Bejder & Samuels 2003; Higham et al. 2009; New et al. 2015; Hawkins et al. 2017).

Species-specific examples

## CETACEANS

**Spinner dolphin - Samadai Management Plan** (Egypt) (Notarbartolo di Sciara et al. 2009)

\* Entry fee (~US\$12) and ticketing system. Income shared between city council, the national environmental agency, and a local NGO.

\* Regular, constant enforcement (currently done by the local NGO).

\* Guide certification scheme organised by the local NGO.

\* During the swim:

**Swim management:** Zoning of the site (dolphin-only area, swimmer-only area, all activity area), time closure (visits to the site 8:00-15:00, swimming 9:00- 14:00), capped visitor numbers (150 swimmers, 100 divers; 10 boats).

**Use of equipment:** mandatory use of life jacket and snorkelling equipment.

#### **Dwarf minke whales - Great Barrier Reef Marine Park Authority (Australia) (Birtles et al. 2008)**

\* Delivery of a comprehensive pre-swim briefing to all participants

\* Crew training

\* During the swim:

**Swim management:** Use of one or two (maximum) safety lines attached to the vessel, vessel tender in the water for emergency only, swimmers can enter the water if the whale is 30+m from the vessel, designated crew members to assist and monitor swimmers' and divers' activities, interruption in case of behaviour of concern.

**Use of equipment:** snorkelling (using a mask, snorkel, fins and wetsuit, without a weight-belt) rather than scuba diving.

**Participant behaviour:** enter the water calmly and with minimal noise, do not touch or make physical contact, hold onto a line at all times, exit the water if signs of disturbance observed.

### **SIRENIANS**

#### **West Indian manatee - [Crystal River Refuge](#), U.S. Fish and Wildlife Service (United States)**

The U.S. Fish and Wildlife Service encourages passive observation, which means not initiating contact with manatees and calmly observing from a distance and at the surface.

\* During the swim:

**Participant behaviour:** prohibition to chase or pursue a manatee, disturb or touch a resting or feeding manatee, dive from the surface onto a resting or feeding manatee, corner or surround a manatee, ride, hold, grab, pinch, poke, prod, or stab a manatee with anything, including hands and feet, stand on a manatee, separate a mother and calf or a group of manatees, give manatee(s) anything to eat or drink, actively initiate contact with belted/tagged manatee(s), interfere with rescue and research activities.

#### **Dugong - Code of Conduct, Vanuatu Environmental Science Society (Republic of Vanuatu) ([Vanuatu Environmental Science Society, n.d.](#))**

\* Delivery of a comprehensive pre-swim briefing to all participants

\* Crew training

\* During the swim:

**Swim management:** maximum four tourists and one guide within 10m of a dugong, interruption in case of behaviour of concern.

**Participant behaviour:** do not touch or feed, swim towards the dugong, or approach mother and calf pairs, stay away from the tail.

### **PINNIPEDS**

**New Zealand fur seal - Marine mammals regulation or permit condition, Department of Conservation (New Zealand)**

\* During the swim:

**Swim management:** maximum 10 people in the water, maximum wet encounter time 60min, and interruption in case of behaviour of concern.

**Supporting vessel:** no sudden or repeated changes in speed and direction, constant speed (idle, no wake, as slow as the slower animal) if <300m from a marine mammal.

**Participant behaviour:** do not touch or feed, no loud or disturbing noises.

## Elasmobranchs

### Introduction

Elasmobranchs are cartilaginous fish including sharks, skates and rays. Commercial in-water interactions target a range of species, including white (*Carcharodon carcharias*), whale shark (*Rhincodon typus*), Oceanic whitetip (*Carcharhinus longimanus*), whitetip reef sharks (*Triaenodon obesus*), manta (*Mobula birostris*, *Mobula alfredi*) and sting (*Dasyatidae* sp.) rays (see Gallagher et al. 2015 for a more comprehensive list). RIWI with sharks is a multi-million industry (Topelko & Dearden 2005) currently occurring in 45 countries and projected to grow further (Cisneros-Montemayor et al., 2013). RIWI with manta rays takes place in 31 countries, 25 of which have specific manta dive sites and focussed tourism operations (O'Malley et al. 2013). Interactions with stingrays are significant tourism industries at several locations worldwide (e.g. Southern stingrays *Hypanus americanus* in Grand Cayman) as rays occur in shallow and easily accessible locations (Vaudo et al. 2018).

In RIWI with elasmobranchs, participants are divers, snorkellers or swimmers. The use of attractants is relatively common, and the adoption of codes of conduct is widespread in RIWIs with sharks (Richards et al. 2015).

### Indicators of disturbance

Recent reviews of the effects of tourism on elasmobranchs species can be found in works led by Gallagher, Lawrence and Bessa (Gallagher et al. 2015; Lawrence et al. 2016; Bessa et al. 2017), among others.

**Sharks.** The responses of sharks to in-water interactions vary between species and locations (Cubero-Pardo et al. 2011) and depend on the behaviour of the shark at the onset of interaction, the characteristics of the approach (e.g. distance of boat and divers/snorkellers, direction), the number of divers and their behaviour and additional aspects of the RIWI practice (e.g. provisioning. Clua et al. 2010) (Quiros 2007; Pierce et al. 2010; Smith et al. 2010; Cubero-Pardo et al. 2011; Haskell et al. 2015). Direct approaches, sudden movement from divers, and distances <4m for a number of species (Cubero-Pardo et al. 2011), and touching, flash photography and swimmer diving towards the animal (Quiros 2007), as well as close approaches (Haskell et al. 2015), for whale sharks were predictors of stronger avoidance responses. The duration of RIWI with whale sharks was shorter if the animal had previously avoided boats or swimmers (Pierce et al. 2010).

**Manta rays.** Few studies are currently available on manta rays' responses to disturbances. Individuals display immediate avoidance responses (e.g. increased speed) or changes in behavioural state, such as interruption of feeding and departure from a cleaning station, when approached. Factors affecting the occurrence and characteristics of the response included the initial behavioural state and age class of the manta ray, the amount of surface splash produced by swimmers, the approach strategy of the tour operator or photographer, the duration of the interaction and whether it was the manta ray's first interaction that day or not (Venables 2013; Venables et al. 2016).

**Stingrays.** RIWI with stingrays most often involves touching and food provisioning (e.g. non-natural, packaged California squid *Loligo opalescens* in Grand Cayman. Corcoran et al. 2013). In Stingray City Sandbar, provisioned stingrays were found to display markers of suboptimal physiological condition compared to their wild conspecifics (Shackley 1998; Semeniuk et al. 2007, 2009) and had

lower body condition, more injuries by boats and predators, increased eco-dermal parasite loads and intense interference competition with conspecifics, resulting in higher numbers of bite marks (Semeniuk & Rothley 2008). Fed stingrays modified their diurnal patterns of activity and their movement behaviour and spatial distribution (Corcoran et al. 2013), with differences between sexes and age classes, as adult females – the main component of the aggregations at Stingray City Sandbar - displayed longer residency (Vaudo et al. 2018). In Hamelin Bay (Australia), rays showed attraction to humans, resulting in aggressive competition, but had fewer skin lesions and grouping behaviour than elsewhere (Newsome et al. 2004).

#### Specific issues of concern and risk related to the activity

**Provisioning.** Provisioning is the use of feeding (passive, active barrier, active hand), chumming (oils or liquids, fish parts) and luring (visual presentation of fake or real lures) to bring animals closer to a dive/swim site (Lawrence et al. 2016). The practice poses risks to both the animal and the human participant, as it may affect the animal's welfare and health (Semeniuk & Rothley 2008; Semeniuk et al. 2009; Murray et al. 2016), alter a species' natural behavioural patterns (Orams 2002; Semeniuk & Rothley 2008; Corcoran et al. 2013), residency patterns and home range size (Dobson 2006; Clua et al. 2010; Corcoran et al. 2013; Bruce & Bradford 2013), foraging areas (Gallagher et al. 2015) and lead to modified species assemblages (Ilarri et al. 2008).

By attracting a higher-than-normal number of individuals in the same place, provisioning causes unusually high densities of animals, which in turn lead to increased injury rates (from boats, conspecifics and predators), ectodermal parasites and aggressive interference competition (Semeniuk & Rothley 2008). Associated risks of the practice include overfeeding, feeding the wrong food, damage from fishing hooks (Newsome et al. 2004) and, in most extreme situations, a complete dependence of the animals on the provisioned resources (Corcoran et al. 2013). Furthermore, as animals congregate at one site, other sites may become deprived of the species, with ensuing ecological consequences (Dobson 2006). Finally, high concentrations at feeding sites could make individuals more vulnerable to targeted fishing and consumption uses (Dobson 2006).

#### General recommendations

- **Adopt a precautionary approach**, as little is known on the behavioural and biological effect of tourism on elasmobranchs. In the case of highly migratory species, evaluate the effectiveness of protected area networks and, if inadequate, resort to other regulations (Lucifora et al. 2011).
- **Regulate provisioning** to minimize risks for the wildlife as well as the human participants. The impacts and management of feeding wild fish are case- and species-specific (Patroni et al. 2018).
- **Regulate operations** by managing group size and participant behaviour, introduce legally binding national guidelines (Richards et al. 2015), provide adequate enforcement and education. No single strategy can fit all situations, but plans that reduced tourist density, restricted interactions between tourists and animals, and imposed a fee could improve animal longevity and health (Semeniuk et al. 2010).
- **Support scientific research** on the welfare and long-term effect of interactions and provisioning (Gallagher et al. 2015) and on the hereditary or socially-learned nature of non-natural behaviours (Corcoran et al. 2013).

## Existing guidelines and resources

Recent compendia of elasmobranch studies and management can be found in Dearden et al. (2008), O'Malley et al. (2013), Gallagher et al. (2015) and Lawrence et al. (2016). The differences in practices from context to context are striking and so is the variety in the management solutions adopted, ranging from community-based (e.g. Cárdenas-Torres et al. 2007) to top-down governmental schemes. Venables, in 2013, reported on the absence of formal codes of conduct for interactions with manta rays implemented and enforced by management agencies, but listed a number of existing codes in Western Australia, Indonesia and Mozambique, among others.

- **Legislative framework**, including relevant regional and national governmental laws and regulations on recreational in-water interaction with elasmobranchs species, as well as wildlife protection and harassment, may apply.
- **Existing general RIWI guidelines and regulations** issued by governmental and non-governmental agencies and organizations:

Guidelines often include regulations on

- Guide and operator certification
- Participant behaviour: no touching, chasing, riding, petting, harassing, interrupting the swimming path or attempting to trap.
- Use of equipment: wetsuits, snorkelling equipment, underwater flash photography, use of motorised propulsion aids.
- Swim management: maximum number of divers/snorkellers per swim, participant:guide ratio, maximum interaction time.
- Supporting vessel procedures: speed of approach and idle situations
- Definition of no-swim situations: in waters where sharks are known to be present or are currently present, during darkness or twilight hours, in waters with known effluents or sewage, in waters used by fishermen (especially if there are signs of bait fishes or feeding activity).

### Useful resources

- Guide to science-based best practices per taxon (Lawrence et al. 2016)
  - Review of shark hotspots for conservation (Lucifora et al. 2011)
  - [Project AWARE](#)
  - [Manta Trust](#)
  - Manta Pacific Research Foundation (MPRF) [operator standards](#) and [participant guidelines](#)
  - Project Manta [Code of Conduct](#)
  - Manta Watch [Code of Conduct](#)
  - [Ningaloo Marine Park - Information for Visitors](#)
  - [International Shark Attack Files](#) (Florida Museum of Natural History n.d.)
- 
- **Scientific research for impact assessment, monitoring and management**, including available frameworks and recommendations for identification of critical contexts and units (Gallagher et al. 2015; Gallagher & Huvneers 2018) and for ecological, socio-ecological investigation and adaptive management (Duffus & Dearden 1990; Dearden et al. 2008; Catlin & Jones 2010; Semeniuk et al. 2010).

## Species-specific examples

### SHARKS

**White shark - [Marine Living Resources Act, 1998 \(Act no.18 of 1998\): regulations for the management of white shark cage diving](#) (South Africa) (Richards et al. 2015)**

\* Number of permits and areas of operation, fees and punishments for violations and for operation without permit.

\* During the swim

**Swim management:** only operators may engage in chumming, chumming only within areas stipulated by the permit, no-operation during school holidays at specific locations, operators must drop a baited line if a shark takes the bait.

**Participant behaviour:** no diving outside the cage, no touching, tagging or interfering with any shark, no dumping of any material.

**Provisioning:** each cage diving boat is allowed 25 kg of bait per day.

**Whale shark - [Gladden Spit and Silk Cayes Marine Reserve](#), Southern Environmental Association and the Belize Department of Fisheries (Belize)**

\* Guide certification (licence, diving and/or snorkelling certification, graduation from an approved whale shark course).

\* Time closure: leave the water at 5.00pm and the reserve by 5.30pm.

\* Entrance fee: US\$15 fee.

\* Pre-swim briefing

\* During the swim:

**Swim management:** 8:1 snorkeller:guide ratio, 8:1 divers:dive master ratio, tour limited to 1.5h slots for the season (allocated by lottery), max 6 boats permitted in the Whale Shark Zone at any time.

**Participant behaviour:** 3m from the whale shark, no chase, ride or touch (finable offense), maximum diving depth 24m, leave the water as soon as the guide instructs.

**Use of equipment:** no flash photography, no cameras on poles.

**Supporting vessel:** speed of approach 2 knots and idle, do not block shark's path, discharge passenger 15m from the shark, boats 15m from sharks and 60m from each other.

## RAYS

**Manta ray - [Regulation on the Protection and Preservation of Baa Atoll Hanifaru Marine Protected Area \(Regulation number 2012/R-23\)](#), Environmental Protection Agency (Maldives)**

\* Area closure scheme: core, buffer and transitional areas at different accessibility, drop off/collection and entry/exit areas clearly identified.

\* Time closure scheme: no entry from 18:00 to 06:00.

\* Certification scheme for guides (with the Environmental Protection Agency of the Maldives).

\* Regular patrol and enforcement.

\* Entry fee (US\$20), going to [Baa Atoll Conservation Fund](#) (BACF), which includes representatives of invested stakeholders (e.g. fishermen, resorts, scientists, councillors).

\* Alternate access days for resorts and liveaboards.

\* Capped vessel (max=5) and tourist numbers (max=80) at one time.

\* During the swim:

**Swim management:** 10:1 swimmer:guide ratio, swim maximum duration 45min.

**Participant behaviour:** 3m from animals, do not cross or obstruct the animal's path.

**Use of equipment:** snorkelling only, no diving and no underwater scooters, use of flashlight only with special permission.

**Supporting vessel:** max speed 2kn, use of mooring buoys, only one vessel at the time allowed at drop off zone, 50m from animal.

**Stingray - [Stingray City and Sand Bar Wildlife Interaction Zones](#), [Marine Conservation Law](#), National Conservation Council (Cayman Islands)**

\* Permit and licencing system.

\* Area closure scheme: designated Wildlife Interaction Zone, Scuba diving zone, feeding stations.

\* Time closure scheme: no entry to Sandy Bar Area after 14:00 on weekends and after 15:00 on public holidays.

\* Capped number of visitors for each vessel (100 people) per trip.

\* During the swim:

**Provisioning:** max 0.5 kg of approved food (ballyhoo squid) per trip, provided only at the designated feeding station by one designated staff member.

**Swim management:** no entry to Sand Bar Area if 20 permitted tourist boats are already present, no discharge of passengers if 1,500 people are already in the area, maximum duration of the visit 1h.

**Participant behaviour:** no footwear in water shallower than 1.5m, no removal of stingrays or other marine life from the water, no feeding of marine life.

**Supporting vessel:** clearly displaying permit, no direct discharge of waste or foul water, no selling of fish from the vessel, no anchoring in water shallower than 1m or within 6m from a reef structure.

## Turtles

### Introduction

The highest volumes of people interacting with sea turtles normally occur at nesting beaches (Trave et al. 2017), but in-water interactions (either occasional and incidental during coral reef snorkelling, or targeted) have recently grown in popularity. RIWIs with green (*Chelonia mydas*), loggerhead (*Caretta caretta*) and hawksbill turtles (*Eretmochelys imbricata*) are reported in Hawaii, Egypt, Mexico and Barbados, among others (Landry & Taggart 2009).

### Indicators of disturbance

Sea turtles are regarded as species of conservation concern, yet the knowledge of their biology and of human–turtle management interactions is still insufficient (Hamann et al. 2010). In Barbados, food provisioning and tourism interactions led to changes in turtles' behaviour, growth patterns, body condition, and vitamin, mineral, hematologic and biochemical values (Horrocks et al. 2007; Stewart et al. 2016). Flight responses to snorkellers were recorded at distances <3m, but responses could vary between and within juveniles turtles, which were classified as 'bold' (reduced evasiveness, potentially at higher risk of predation) or 'timid' (sensitivity to disturbances, causing higher energetic expenditure) (Griffin et al. 2017). Turtles approached, touched or chased by recreational swimmers were more likely to interrupt their behaviour (Meadows 2004), and in particular to discontinue eating, investigating and breathing activities when approached by divers (Hayes et al. 2017). It was cautioned that disturbances directly affecting feeding turtles can have adverse impacts on individual behaviour and physiology (Meadows 2004; Taquet et al. 2006). Population-level consequences may be anticipated.

### Recommendations

- **Adopt a precautionary approach** in the establishment of new RIWI with turtles and allow them only under strict regulations. Use time-area closure schemes to minimise disturbances in core, specific-use areas (Landry & Taggart 2009; Griffin et al. 2017), demarcate no-wake swim zones off nesting beaches for the safety of turtles and snorkellers and designate no-swim zones.
- **Only allow passive interaction** and prohibit touching, collecting and taking turtles out of the water.
- **Minimize impacts and disturbances to the seagrass habitats** caused by RIWI and associated operations, for instance by relegating vessel anchoring to non-sensitive areas.

### Existing guidelines

A plethora of guidelines and regulations are available for land-based operations (Trave et al. 2017) but not for in-water interactions.

- **Legislative framework**, including relevant regional and national governmental laws and regulations on recreational interaction with turtle species, as well as wildlife protection and harassment (Frazier 2002; Hykle 2002), may apply.
- **Existing general RIWI guidelines and regulations** issued by governmental and non-governmental agencies and organisations:

Guidelines often include regulations on

- Swimmer behaviour - no touching, chasing, riding, petting, feeding, harassing, interrupting the swimming path or attempting to trap a turtle.

### Useful resources

- [Convention for the Protection and Development of the Marine Environment in the Wider Caribbean Region](#) (WCR) or Cartagena Convention, and [Protocol Concerning Specially Protected Areas and Wildlife \(SPAW\) in the Wider Caribbean Region](#)
- [Wider Caribbean Sea Turtle Conservation Network](#) (WIDECAST) training and resources (Choi & Eckert 2009)
- [Inter-American Convention \(IAC\) for the Protection and Conservation of Sea Turtles](#)
- [The Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden](#) (PERSGA) action plan and review of management tools for the region (Mancini et al. 2015)
- [Ocean Etiquette Programme](#) guidelines
- [Coral Reef Alliance](#) guidelines
  
- **Scientific research for impact assessment, monitoring and management**, following recommendations for research (Hamann et al. 2010) and conservation priorities (Wallace et al. 2011), and using methods for the identification of critical contexts and units (e.g. Hayes et al. 2017) and of core, coastal critical habitats (feeding grounds, resting areas, cleaning stations) that could provide important information on growth rates, diet, behavioural patterns, abundance and distribution, and population structure (Bjørndal 1999), as well as on impacts of anthropogenic disturbance (Wallace et al. 2011).

### Species-specific examples

#### **Green, loggerhead and hawksbill turtle - [Akumal Bay, Comisión Nacional de Áreas Naturales Protegidas \(CONANP\)](#) (Mexico)**

\* Area closure scheme: a no-swim area is demarcated with buoys and ropes.

\* Time closure scheme: swimming and sighting of sea turtles is not allowed in September-February, on Mondays, and is only permitted from 09:00 to 17:00.

\* Guide certification by CONANP.

\* During the swim:

**Swim management:** use exclusively the routes and timetable established, 6:1 snorkeller:guide ratio, swim maximum duration 55min, 10m between groups, suspend activities if turtles display signs of avoidance.

\* **Participant behaviour:** entrance from, and exit to the beach slowly and quietly, mandatory life jackets (to avoid total immersion), 3m from the back of each turtle, maximum observation time 5min, prohibited to touch, feed, disturb, retain, remove, hold, and/or damage any specimen of wildlife.

## Summary and Recommendations

Most recent advancements in the understanding of implications and effects of recreational in-water interaction with aquatic species emphasise the need to regulate such activities with **tailored, precautionary** and **adaptive** plans. However, **major challenges and gaps** in research and management still hamper, halt or complicate efforts to shift towards more sustainable RIWI practices.

There are **intrinsic difficulties** in studying and understanding the behaviour and biology of long-lived, wide-ranging and elusive marine species. Likewise, the human dimension of such experiences includes a multitude of psychological, cultural, ethical, economical and political aspects and factors of difficult investigation and interpretation. The current progresses in theoretical, analytical and technological resources available to scholars and professionals may more effectively address these difficulties in the near future. In the meantime, it is recommended to

- \* **Spread awareness** on the implications of RIWI operations to encourage the adoption of **precautionary approaches** for their management. This can be achieved with focussed, expert, science-based policy recommendations to governmental, inter-governmental and non-governmental organisation, as well as with non-specialized communication to the general public.
- \* **Enhance the technical, financial, legal and political tools and support** available to those exploring the use of technological advancements, developing and validating new analytical tools, and conducting field-based impact assessment studies for the conservation of wildlife involved in in-water interactions.
- \* While urging that all RIWI operations be strictly regulated and monitored,, **prioritise actions and efforts** on species that are already vulnerable but poorly studied, at locations where tourism and economic interests may be overpowering and in contexts where this field of research is novel.
- \* Foster **collaboration** between organisations and/or create multi-expertise and **multi-disciplinary committees** involving experts from the natural and social sciences to investigate the complex RIWI phenomenon with holistic and comprehensive perspectives.

Furthermore, a **gap between theory and practice** remains. Practitioners are sometimes left with minimal direction on how to practically and effectively implement recommendations and best practices in each specific context. Following the CMS Resolution on Aquatic Mammal Swim-With Programmes, together with the preparation of species-specific guidelines, CMS should encourage and facilitate dialogue with, and support for the interested parties. In particular, the following suggestions could be further explored and developed

- \* Provide a wider and easier **access to case studies and experiences** in non-specialized and non-academic formats to facilitate those involved in management planning at new destinations, with multiple stakeholders, and in contexts where traditional approaches are not applicable and unconventional, creative solutions are sought. Similarly to the CMS/IWC Whale Watching Handbook, a **centralized, open access, user-friendly resource** including updated information on relevant literature, laws, codes of conducts, scientific advancements and case studies on RIWI with taxa other than cetaceans. As the knowledge on the impacts and management of interactions with sharks, rays, turtles, sirenians and pinnipeds is far more scattered and less advanced than that on cetaceans, such a database would provide extremely useful insights.
- \* Promote the work of existing and, if necessary, support the establishment of new **regional multi-disciplinary committees or chapters** composed of local professionals and experts in the

relevant natural and social sciences as ideal platforms to discuss and identify local challenges and solutions, provide informed advice on specific cases, facilitate multi-level engagement and co-creation opportunities within and between regions and countries.

- \* Make **information on regulations and code of conducts easily accessible to all stakeholders** involved in the RIWI operation. Participants' awareness of regulations is most probably limited to the information they receive before or during the excursions, therefore ranging from exhaustive to nil, depending on the operators and local requirements. In an attempt to help tourists choose an experience, prepare for the interactions and, by being aware of them, promote and monitor compliance to regulations, information on permits and codes of conducts must be easily found and directly accessible. Managing agencies should be urged to ensure clear visibility of such information on national and local authorities' online platforms, as well as on-site. Opportunities to feature such information on international independent websites and resources that tourists are likely to consult (e.g. TripAdvisor, Wikipedia, travel guides, in-flight magazines), in local and international languages, should also be explored.

Based on the literature reviewed and the reflections presented in this document, the CMS Secretariat, Scientific Council and Parties, as well as operators and participants to RIWI, can already take actions to address those gaps and challenges.

The **CMS Secretariat** is urged to

- **Maintain a focus on the issue** through the continuous support of existing and new dedicated working groups and the facilitation of collaborations with relevant partner organizations.
- **Promote and coordinate the creation of resources** as exhaustive as the Whale Watching Handbook for other charismatic aquatic species.
- **Assess opportunities to arrange partnerships with independent, private organizations and companies** (Tripadvisor, Wikipedia, airlines, travel guides publishers) to support the CMS Scientific Council and CMS Parties in the divulgation and communication of RIWI-related information to participants.

We recommend the **CMS Scientific Council** to

- Develop a **compendium of guidelines and regulations** for in-water interactions with aquatic species. This may include the collation of existing guidelines per species and/or geographic area, but also the development of original ones. Priority should be given to species that are already vulnerable, locations where tourism and economic interests may be overpowering and contexts where research and management on RIWI is novel.
- Review the existing scientific information to clearly **identify and describe situations of severe concern** in which interactions should not occur at all. This includes, but is not limited to, the listing of critical spaces and times (e.g. resting, feeding and reproductive areas, seasonal or daily behaviours) and population units (e.g. mother-calf pairs, specific local units).
- Encourage collaboration within and between relevant working groups to **develop research guidelines** on short- and long-term monitoring of the effects of RIWIs on wildlife and ecosystems (behaviour before, during, after disturbance, population demography, individual movement and residency) as well as on human participants (perceptions, motivations, specialization, satisfaction, compliance) and hosting communities (policy, conflict management, economic aspects, governance). In order to achieve this objective, the Council should

- \* Facilitate the distribution of existing or the creation of new, specific, step-by-step **action plans**;
  - \* Identify useful and meaningful **indicators and markers** to define thresholds and to inform adaptive management on the long term;
  - \* Appoint **dedicated advisors and experts** from relevant working groups to assist researchers and decision-makers in the CMS Parties.
- Facilitate access to existing and, if needed, produce new guidelines for a more **effective outreach and communication of the risks and benefits** of RIWIs to the interested parties (tourism operators, legislators, tourists, visitors, local communities, etc.). These should take note of specific **strategies for promoting behavioural change** in human participants recommended by expert groups (e.g. [Conservation Marketing and Engagement Working Group](#) and [Social Science Working Group](#) of the Society for Conservation Biology). Such efforts could include, for instance, advices on effective tools, designs and formats, recommended language and vocabulary, and the development of templates and guidebooks.

**CMS Parties** are encouraged to

- **Acknowledge** the detrimental effects of the activity, **discourage the establishment of new RIWI operations and strictly regulate the existing ones**. This includes, but is not limited to:
  - \* The creation of **legal tools to act on the basis of precaution** and the amendment of unspecific, understandable and ambiguous terminology in legislation (e.g. 'harassment'. Sorice et al. 2003; Tyne et al. 2015; Aquatic Mammals Working Group of the Scientific Council 2017);
  - \* The adoption of **effective strategies and tools** to minimize unpredictability and invasiveness of in-water interactions (guidelines, control of access, enforcement, awareness and education) where operations are already permitted;
  - \* The **implementation of vulnerability and impact studies** prior to the establishment of new RIWI operations, especially when they may target species already vulnerable, locations where tourism and economic interests may be overpowering and data-deficient areas and populations;
  - \* The issuing of strict **regulations on food provisioning** and the use of **attractants**, where these practices occur;
  - \* The creation of logistic, financial and administrative tools to support and enable the **advancement of scientific knowledge and understanding** of the individuals, populations and species targeted by RIWI operations in their jurisdiction.
- **Provide informed and easily accessible information** on RIWI operations and their management to all involved stakeholders (tour operators, local and international participants, service providers, local communities). This includes, but is not limited to
  - \* The provision of **clear, open access, easily searchable, updated and unambiguous information on RIWI regulations and guidelines** through managing agencies, government bodies and local administrations. When possible, official translations in other relevant languages (e.g. those of the more represented tourist nationalities, local languages) should also be provided;
  - \* The identification of **experts and advisors** (ideally members of one or more relevant working groups and committees, or *ad hoc* panels) that managers and other stakeholders

can consult for support and clarification of matters related to management of RIWIs in their jurisdiction;

- \* The facilitation of **collaborative partnerships** within and between local stakeholders and invested parties in co-creative management strategies. This includes, for instance, the creation of dedicated panels or community groups to promote exchanges, mediate conflicts and foster a pro-active dialogue between the governmental and non-governmental agencies involved in impact studies, conservation and marine tourism development. As these may involve international partners, trans-boundary collaborations may be not only required, but also desirable;
- \* A **commitment to urge all stakeholders to communicate the nature, implications and regulations of RIWI in a consistent way**, so that confusion on the existence, interpretation and relevance of regulations is minimized. This would be particularly important in situations where regulations are non-uniformly applied (e.g. swim-with is allowed at one site but not at the adjacent one, regulations 'on paper' due to lack of enforcement), tourism is largely international or national legislation is ambiguous in terminology or applicability to local contexts. This may include urging tour operators and management agencies to provide information on the existing regulations and guidelines on their online and printed promotional material, as well as in their briefing. The national or regional use of standardized formats and templates to display regulations would expose participants to more consistently presented, hence easily absorbable, contents.

Finally, those **providing, and participating to, RIWI operations** are urged to

- **Be aware**, and make others aware, of existing regulations and guidelines. For tour operators and service providers, this should be done regardless of licence/permit conditions requiring it. Tourists and RIWI participants are encouraged to seek information from sources other than their tourist providers (governmental and non-governmental websites, scientific publications, blogs, other operators, etc.).
- **Comply** with regulations and guidelines at all times, **facilitate** the work of enforcing agencies and **engage** in local management.
- **Lobby** decision-makers and **advocate** for the issuing and implementation of regulations and guidelines at locations where they are missing.