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# DRAFT GUIDELINES FOR THE MANAGEMENT OF CETACEAN WATCHING ACTIVITIES IN THE ACCOBAMS AREA

# DRAFT GUIDELINES FOR THE MANAGEMENT OF CETACEAN WATCHING ACTIVITIES IN THE ACCOBAMS AREA

Presented by Gianna Minton, Expert

**Issue**: revising the Guidelines for monitoring programs aimed at maximizing the chance of detecting potential adverse impacts of whale watching activities on individual cetaceans and on populations (Annex 3 of Resolution 6.20).

## 1. Action requested

The Scientific Committee is invited to:

a. Review and endorse the draft Guidelines for the management of cetaceans watching activities in the ACCOBAMS Area.

## 2. Background

During the period 2020-2021 the Whale Watching Working Group (WWWG) worked on-line and identified some discrepancies between the objective of the 2020-2022 Program of Work related to whale watching and the planned activities listed in the WWWG ToR.

In particular, the WWWG pointed out the need to revise the *Guidelines for monitoring programs aimed at maximizing the chance of detecting potential adverse impacts of whale watching activities on individual cetaceans and on populations* that were included in the Annex 3 of Resolution 6.20 adopted in 2016 by the Meeting of Parties.

In this context, Gianna Minton was engaged to revise these guidelines. The document presents the revised Guidelines following the review made by the Whale Watching Working Group in July-August 2021.

# Draft Guidelines for the management of cetacean watching activities in the ACCOBAMS Area

Photo courtesy Photo courtesy of ICNF/RNES, Portugal

**Draft:** November 2021 – for submission to the ACCOBAMS Scientific Committee meeting

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**Reviewed by:** The ACCOBAMS Whale Watching Working Group.

# 1. Introduction

## Background and context

When conducted responsibly, whale watching activities have the potential to generate income and livelihoods for coastal communities, as well as contribute to public awareness and scientific understanding of whales, dolphins and porpoises and their conservation needs[1]. However, when the industry develops too fast, or operators engage in irresponsible practices, whale watching also has the potential to become another source of pressure on wild cetacean populations that may already be suffering decreased fitness or population declines from bycatch, habitat degradation, climate change, and other pervasive threats [e.g. 2,3].

Aware of this risk, ACCOBAMS has demonstrated a proactive stance on the promotion of responsible whale watching activities from its inception. In Section 1.c) of Annex 2 to ACCOBAMS, the Parties require that 'impact assessments be carried out in order to provide a basis for either allowing or prohibiting the continuation or the future development of activities that may affect cetaceans or their habitat in the Agreement area, *including tourism and cetacean-watching*, as well as establishing the conditions under which such activities may be conducted'. ACCOBAMS Resolution 4.7 sets forth clear guidelines for commercial cetacean watching in the ACCOBAMS area, and Resolution 6.20, Annex 2, expands this advice by providing a detailed description of the standards associated with the High Quality Whale Watching (HQWW)© Certificate, and the code of conduct operators must follow to achieve that label. Through these resolutions, ACCOBAMS provides very clear guidance for tour operators on how to handle vessels and run their tours in a manner that minimises impacts to cetaceans and maximises the potential conservation benefits of their tours.

To complement these guidelines for operators, this document is intended to support managers and other stakeholders responsible for designing, implementing, and enforcing management measures to ensure that whale watching activities are conducted in a manner that minimises potentially negative impacts on the cetaceans that are the focus of tourism activities. As such, it takes a higher-level approach and considers multiple aspects of effective management and regulation of whale watching in the ACCOBAMS area, with a focus on recommendations to those stakeholders who may be acting at local, national or regional levels. Technically, this document is an update to ACCOBAMS-MOP6/2016/Doc37/Annex12/Res6.20, Annex 3. Although that annex is titled 'Proposed guidelines for monitoring programs aimed at maximising the chance of detecting potential adverse impacts of whale watching activities on individual cetaceans an on populations', it also deals with broader aspects of management of whale watching. As such, the title of this new document has been changed to reflect a broader remit.

## Definitions

For the purpose of this document a few core terms are defined as follows:

- Whale watching: We use the definition of whale watching used for the landmark study by Hoyt, 2001[1]: 'tours by boat, air or from land, formal or informal, with at least some commercial aspect, to see, swim with, and/or listen to any of the some 83 species of whales, dolphins and porpoises.'

Recreational whale watch tourism conducted by individuals with private recreational vessels is NOT included in the scope of this study.

- Managers: Managers can include representatives of government bodies responsible for regulating tourism, wildlife, protected areas, or law enforcement. However, management teams responsible for designing, implementing and enforcing whale watching management frameworks can include a much wider range of stakeholders, including local communities, NGOs, tour operators and research organisations among others.
- Target species: These are the cetacean species that are most often the focus of whale watching activities in a particular area.

### A note on voluntary versus legally enforceable regulations

Although some studies show that voluntary guidelines, especially if industry-led and self-enforced can be an effective means of promoting responsible whale watching [e.g. 4,5], in many cases researchers and managers alike have concluded that voluntary measures can be associated with low rates of compliance, especially if some operators feel that they are potentially losing business by adhering to voluntary guidelines when unscrupulous 'competitors' are getting their customers closer to whales[6,7]. Legally enforceable management measures create a level playing field by ensuring that all operators are held to the same standard. While many of the measures below can be implemented in either voluntary or legally enforceable frameworks, some will require some level of legal underpinning to be truly effective.

In 2021 a review of whale watching regulations within the ACCOBAMS Area found that out of 26 countries replying to the survey, only ten had legal definitions for whale watching, only two had implemented licensing systems specifically for whale watching activities, and only five had legally enforceable whale watching regulations in place.

### Structure of the document

This document has been structured to include sections that focus on nine different aspects that may be considered when designing a whale watching management framework. Each section begins with a brief summary of the rationale for addressing this aspect of whale watching management. This is followed by a 'menu' of tools and strategies available with some references to peer-reviewed publications and case studies. Each section is concluded with a bullet-point summary of recommendations for managers.

## 2. Measures to assess target populations and the potential impacts of tourism, including the concept of 'carrying capacity'

### Rationale:

Whale watching activities can benefit coastal communities with increased tourism, employment and income[8], and can also help to raise awareness of cetaceans and their conservation needs among tourists themselves[9-11]. However, there is strong evidence that without proper measures in place whale watching can also have a range of negative impacts on the individuals and populations that are the focus of tourism activities[2,12]. These impacts can range from short-term disturbances to feeding or resting, to displacement

of cetacean populations from core habitat and long-term impacts on reproduction and fitness [e.g.13-16]. The potential severity of these impacts will depend on a combination of factors[17], including (but not limited to):

- *the species of cetaceans that are the focus of the tourism*: some species are more sensitive to disturbance from vessels and underwater noise than others, depending on their habitat preferences, behavioural patterns, and the frequencies they use for communication and echolocation[18].
- *the abundance, distribution and conservation status of the cetaceans in question*: If many different species or large populations of cetaceans are available for tourism activities in a particular area, the 'pressure' of whale watching activities can be spread out among individuals or groups. Conversely, in settings where a single small (possibly threatened or declining) population is the focus of repeated attention from whale watching, a small number of individual animals will bear the burden of all the impacts associated with the industry in that area[e.g.19].
- *the way in which cetaceans are using the whale watching area and the behaviours that are likely to be disrupted*: If whale watching occurs in areas or at times of year in which animals are engaged in critical life-functions, like feeding, resting, or nursing their young, the consequences of repeatedly disrupting these activities are likely to be more severe[16,20-24]. Similarly, cetaceans are more likely to be distracted from some types of behaviours than others, with resting and feeding being the behaviours most likely to be abandoned in the presence of whale watching vessels [24-31].
- *The abundance, frequency and duration of whale watching encounters with focal populations*: for all species, regardless of abundance or behavioural state, the potential impacts of whale watching activities will become more severe as the number of vessels, and the duration and frequency of vessel encounters increases[e.g.32-34].
- *The nature of whale watching activities, including the platforms that are used*: Land-based whale watching causes little or no impact to the cetacean populations that are observed. Vessel-based tourism can cause varying levels of disturbance based on the way they approach cetaceans and the type of noise generated by their engines[35,36]. Non-motorised vessels (e.g. Kayaks) do not generate underwater noise, but may disturb cetaceans in other ways[37], while in-water encounters between swimmers and cetaceans have also been documented to have potentially negative impacts[20,38,39].

In light of the potential for negative impacts, and the factors that can determine the severity of impacts, those responsible for managing whale watching activities have an obligation to ensure that the necessary data is available on target populations and the to assess the potential impact of the current or proposed whale watching activities. Ideally this type of assessment will take place *before* whale watching activities commence. However, if that has not been implemented, an assessment is recommended as soon as possible to determine whether ongoing activities are sustainable.

## Tools and examples

- *Methods to assess the distribution, abundance and trends of cetaceans* are available from multiple sources and are too extensive to be covered in detail in this document. ACCOBAMS has an excellent track record in promoting good practice in this area, and the Mediterranean is one of the

best surveyed bodies of water in the world, with multiple reviews of published studies[40], and regular vessel-based and aerial surveys to assess abundance, distribution and trends[41]

- *Methods to evaluate the impact of whale watching activities on cetacean populations* will ideally be implemented before whale watching activities (or a new category of activities) commence. In this case, the evaluation should start with a desk-based review of peer-reviewed literature and case studies featuring the same (or similar) species and whale watching platforms that occur (or are planned) in the area in question. The IWC-CMS Online Whale Watching handbook has three resources that may be useful to gather information on impacts that have been documented in other whale watching locations: 1) a searchable database of literature (https://wwhandbook.iwc.int/en/downloadable-resources/searchable-database-of-scientific-literature), 2) a table of documented impacts (https://wwhandbook.iwc.int/en/industry-support/training-for-captains-guides) and 3) a table of Case Studies (https://wwhandbook.iwc.int/en/responsible-management/case-studies).
- *Pilot studies:* Following a literature review, managers may consider conducting a pilot study in which a single or small number of operators are issued provisional licenses to conduct whale watching activities that can be carefully monitored to document the possible impacts on the target population. The results of such a pilot study can then be used to inform the design and implementation of an effective management framework. New et al. 2015[42] provide an extensive review of methods to model and assess whale watching impacts. These are summarised and referenced in a table in Annex 1. Pilot studies or modelling can also be used to assess the potential impact of a new category of activity (e.g. swimming with cetaceans), before it is permitted on a wider scale[43,44].
- *Defining the whale watching 'carrying capacity' of a targeted geographical area:* The whale watching 'carrying capacity' of a particular area can be defined as the maximum amount of whale watching activity that can be undertaken in a defined geographical area without incurring negative impacts to the target cetacean populations and/or their surrounding environment[45-47]. Studies to determine carrying capacities have been limited to date, but are becoming more common. Examples include a study conducted in Praia del Forte, north-eastern Brazil [45] and an ongoing study in the Sado Estuary of Portugal. The outcome of the assessment can be used to determine the maximum number of vessels, daily tours, tourists, or 'contact hours' that should be permitted to operate in the area in question. These studies normally also assume that licensed operators will follow a code of conduct that minimises their disturbance to the populations in question (see section 6 below).

**Recommendations**

- *If possible, ensure that a full suite of baseline information on the abundance, distribution, habitat use, and conservation status of cetacean populations in the target area is available before whale watching activities commence, or a new category of activity (e.g. in-water interactions) is being considered.*
- *Conduct desk-based literature studies to determine what the potential impact of proposed whale watching activities could be on these populations, based on available information about similar species and tourism platforms.*
- *Conduct small-scale pilot studies to test and document the potential impacts of whale watching activities before activities are allowed to commence on a wider scale. Annex 1 provides a list of study approaches with references to peer-reviewed studies that can serve as examples.*
- *Use the results of the second and third steps above to determine the likely 'carrying capacity' of a particular area targeted for whale watching, and design an appropriate management plan that will not exceed that capacity.*
- *If whale watching activities are already underway, steps 2-4 can still be conducted and current management adapted.*

## 3. Monitoring and adaptive management

**Rationale**

Management measures conceived based on the best available knowledge and tools available at a particular time may not always remain relevant or adequate as the industry, habitat, or targeted cetacean populations evolve and change over time. Continued monitoring of cetacean populations (especially their abundance and trends, but also their health and indications of stress) as well as of the industry, will allow managers to determine whether whale watching practices may be causing harm, and therefore require changes to the suite of management tools in place[48-50]. For example, targeted populations may suffer declines or reduced fitness or increased stress from environmental pressures (for example, fisheries bycatch, increased shipping, coastal construction, climate-change caused shifts in prey), requiring stricter guidelines to limit additional pressure form whale watching. In other settings, tour operator numbers may suddenly expand rapidly, or tour operators who were once happy to comply with a voluntary code of conduct may become more competitive with each other leading to lower compliance and more disturbance to cetaceans[6,51]. These scenarios require a re-assessment of current management measures to determine whether they need to be adapted to ensure the well-being and long-term presence and survival of the targeted cetacean populations.

**Tools and examples**

The following categories of tools can be used to conduct regular monitoring, and ensure that results are used to guide policy adaptations.

- *Involvement of research organisations* in management teams to ensure that the necessary expertise is available to design and implement monitoring studies, and detect possible negative trends in population numbers, health, or compliance[52] (see Annex 1 for examples of methods used to study impacts of whale watching on cetaceans and to monitor the behaviour of whale watching tour operators);
- *A well-defined monitoring and review plan* to detect potential changes in cetacean populations and/or the whale watching industry (see Section 2 and Annex 1 for examples on how studies can be conducted). Some resources advocate 5- or 10 year cycles for evaluation and review of management plans[50].
- *The definition of 'triggers'* or *limits of acceptable change (LAC)* [50] that would require a suspension or re-evaluation of current practices and management measures either as part of, or outside of the normal cycle of review. These can be based on observed/measured changes in the target cetacean population, the industry, or the environment.

**Recommendations**

- *Encourage regular monitoring and evaluation of whale watching activities and the cetacean populations that they target, involving research organisations to detect and measure the potential impacts on cetacean behaviour, distribution, welfare, health or abundance.*
- *Define triggers or limits of acceptable change (LAC) that will require a formal suspension or re-evaluation of current practices.*
- *Be prepared to introduce new measures (see tools below) to further mitigate the impact of whale watching on the targeted populations.*

## 4. Development of effective management teams (stakeholder involvement)

**Rationale**

Many different categories of stakeholders have a role to play in the design, implementation, monitoring, enforcement, and adaptation of an effective whale watching management strategy[52]. These stakeholders range from government agencies and protected area managers to the operators themselves, local communities, cetacean and social science researchers, and marine and coastal law enforcement bodies. Excluding one group from participation in management decisions can lead to alienation, non-compliance, or other pitfalls that ultimately may result in negative impacts on the target populations[47]. The composition of effective management teams may vary from one location to another, as may the priorities and strategies that are identified.

**Tools and examples**

- *Including different categories of stakeholders:* The IWC Whale Watching Handbook[53] features 22 case studies that illustrate different aspects of whale watching management, distilling strengths,

weaknesses and lessons learned from each study. These almost unanimously cite the involvement of multiple categories of stakeholders in management as a strength in their management approach. The handbook also provides a table (adapted from Hoyt 2007[52]) that outlines the different roles different categories of stakeholders can play: https://wwhandbook.iwc.int/en/responsible-management/stakeholder-engagement-and-adaptive-management.

- *Formal frameworks for participation or consultation:* To ensure their participation, stakeholders or their representatives can be members of a formal management body, or managers can involve them through regular public consultations.

**Recommendation**

- *Identify all the stakeholders that have a role to play in assessing, designing, implementing, monitoring, enforcing or adapting management, and determine how each category can most effectively be involved and consulted in a formal, recognised manner.*

## 5. Licensing or certification measures

**Rationale**

The scope and scale of potential impacts of whale watching activities on target populations will most logically be proportional to the number of vessels and tours that are operating in a particular location. Several studies have demonstrated increasing levels of reactions (for example changes in swimming patterns or vocal behaviour, suspension of feeding, or resting etc.) with increasing numbers of vessels or increased time that animals are exposed to vessels [54,55]. One effective way to limit the potential disturbance to cetaceans is to limit the number of operators or vessels in an area by requiring all whale watching vessels to be licensed, and to limit the number of licenses that are issued (perhaps in line with an established carrying capacity – see section 2). A 2021 study has demonstrated that disturbance from whale watching vessels may vary from one type of vessel and/or engine category to another, recommending that this be taken into consideration when licensing operators[56]. Licensing can also be a useful means to maintain an accurate overview of the number of whale watching tour operators and their activities, and to ensure that licensed operators adhere to certain conditions to obtain, and retain their licence.

**Tools and examples**

- *Legal underpinning for licensing:* Effective licensing or permitting of whale watching activity requires a legal definition of whale watching or marine mammal tourism. As of 2021, Spain and Portugal are the only countries in the ACCBOAMS area that have legal definitions of whale watching (In Portugal, Decreto-Lei-n.o-9/2006, and in Spain Decree-1727_2007). Subsequently are also the only two countries to have whale watching licensing schemes in place.

- *Capping the number of licenses*: The number of licenses issued may be limited per port/harbour or province and linked to formal studies to assess carrying capacity[45] (see section 2), or it may be established based on 'instinct'.
- *Standards or codes of conduct as conditions of licensing:* Alternatively, the number of licences may not necessarily be limited, but could still serve to improve management and mitigate impacts of whale watching by placing conditions on licensing that hold operators to a minimum standard. These conditions/requirements can include the following elements (as they do in Portugal, for example):
    - A prior permit/licence to operate as a commercial tourism business with proper registration with the chambre of commerce etc.;
    - Proper registration of vessels with the relevant port authorities, and specification of the exact vessels that will be used for whale watching activities;
    - A definition of the geographical area in which the operator intends to conduct tours;
    - Demonstration of appropriate qualifications for each crew member (skipper, deckhand, naturalist guide, etc.);
    - Proof that at least one crew member has been designated and trained to deliver an educational component to the tour (see section 9);
    - An agreement to adhere to a code of good conduct (see section 6).
    - An agreement to contribute to research and knowledge of the target species by sharing data on cetacean sightings with the relevant authorities at the end of each season/year (see section 10).
- *Monitoring and enforcement:* Licencing schemes require a system of monitoring and enforcement to be effective, as there must be penalties for operators who offer tours without licences or operators who do not comply with the conditions of licensing. This requires collaboration with the coast guard or similar bodies, who must be familiar with the laws and the penalties or fines that can be imposed for non-compliance (See section 7).
- *Voluntary certification*: A voluntary form of licensing, is a certification scheme that operators can choose to apply to, such as the ACCOBAMS High Quality Whale Watching

**Recommendations**

- *Work toward a legal definition of whale watching as a category of commercial tourism activity for which specific regulations and licencing measures can be put in place.*
- *Use available data on cetacean populations and the possible impact of whale watching activities to determine whether the number of licenses issued should be limited to a certain number of vessels and/or tours.*
- *Determine (ideally in collaboration with the multi-stakeholder management team) what conditions should be tied to the issuing and renewing of licenses to operate whale watching tours.*
- *Maintain a database of licensed operators and their vessels, and consider regular communications through newsletters and/or (virtual) meetings at the start and/or end of each season.*
- *Ensure effective monitoring and enforcement of licensing requirements (see Section 7).*

## 6. Measures to regulate approaches, frequency, length and type of exposure in encounters with cetaceans

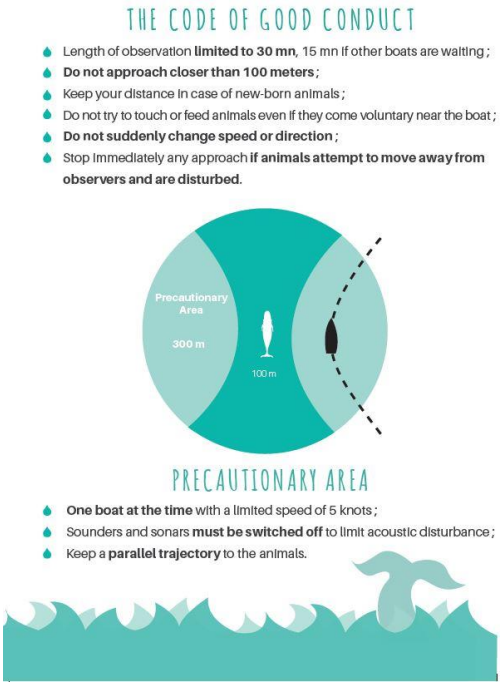
**Rationale**

As outlined in Section 2, studies have demonstrated that the scope and scale of potential impacts of whale watching activities on cetaceans can vary depending on the species in question and the way that vessels are operated in proximity to cetaceans. Studies indicate that whales' and dolphins' reactions to boat presence vary with the distance of approaches e.g. [57], the number of vessels within a certain radius of the animals e.g. [54,55], the direction from which vessels approach[43], and with the presence of calves[58]. Codes of conduct have proven effective in reducing the impact of whale watching on cetaceans, by regulating the speed and direction of approaches, limiting number of vessels that can be within a certain radius of whales or dolphins, and dictating whether or not swimmers are allowed to enter the water with cetaceans, and if so, under which specific conditions[59].

**Tools and examples**

- *Legally enforceable vs. voluntary guidelines*: As noted in Section 1, Codes of conduct including vessel approaches etc, can be voluntary or legally enforceable.

- *Guiding principles:* The details of effective regulations or codes of conduct may vary by species and/or location to ensure that they are appropriately tailored to local conditions. Many approach guidelines condone closer approaches for dolphins than for whales, for example, and many also apply stricter measures to whale or dolphin groups with calves than those without. Some guidelines stipulate that Critically Endangered species (such as the North Atlantic Right Whale on the NE coast of the United States) should not be approached for tourism at all. While tailoring guidelines to local needs is important, there are a number of guiding principles have been identified by the International Whaling Commission. Those developing guidelines should be driven by the principle that disturbance to natural behaviour should be minimised, and as much as possible the nature and duration of the interaction between a cetacean and a vessel (or swimmer) should be determined by the animal and not the humans hoping to observe them.




- *ACCOBAMS resources*: ACCOBAMS Resolution 4.7 provides very clear guidance for tour operators on how to handle vessels and in a manner that minimises impacts to cetaceans. Resolution 6.20, Annex 2, provides a detailed description of the standards associated with the High Quality Whale Watching (HQWW)© Certificate, and the code of conduct operators must follow to achieve that label.
- *IWC resources:* The IWC Online Whale Watching Handbook also includes a searchable table of both voluntary and legally enforceable guidelines that can be consulted as examples: https://wwhandbook.iwc.int/en/downloadable-resources/guidelines-and-regulations
- *Transparency and Communication*: Codes of conduct/approach guidelines will be most effective if they are clearly communicated with well-illustrated and succinct materials that can be shared with operators via traditional (printed) materials as well electronically and via social media. Ensuring that vessel conduct regulations are clear and simple will make it easier for vessels to comply, and also easier for those who are monitoring and enforcing regulations to clearly recognise and penalise non-compliance. If compliance with guidelines is intended to be monitored and/or legally enforced, work with relevant stakeholders to make sure they are aware of the guidelines and the penalties for infractions (see section 7).

**Recommendations**

- *Conduct a literature review of the potential impacts of whale watching activities on the species found in the target area, as well as the measures that have been used to mitigate impact for that species and the type of whale watching activity in question.*
- *Work with relevant stakeholders to develop approach guidelines that are most appropriate for your area.*
- *Ensure effective communication of the conduct guidelines (whether voluntary or legally enforceable) to all relevant stakeholders, and ensure that those responsible for monitoring and enforcement know how to recognise and penalise infractions.*

## 7. Monitoring and Enforcement

### Rationale

As noted in Section 1, legally enforceable regulations can ensure that all whale watching operators are held to the same standard in terms of adopting behaviours with the least impact on cetaceans. However, for these regulations to be effective, operators must know that there will be negative consequences for infractions, otherwise there is little incentive to comply[60,61]. The bodies responsible for marine surveillance vary from one country to another, but can include marine police, the coast guard, the navy, and park rangers, among others[7,62,63]. Voluntary certification schemes also require some form of monitoring and enforcement of standards, if they are to be effective. As stated in Section 6, monitoring and enforcement will be much more effective if 1) codes of conduct are clear and simple enough that infractions are easy to recognise, and 2) the penalties for infractions are clearly defined and clearly communicated to all the relevant stakeholders.

### Tools and examples

- *Vessel-based patrol by coast guard or other marine enforcement bodies:* Traditionally, monitoring and enforcement is conducted by patrol vessels at sea that can approach whale watching vessels to request evidence of their legal status to conduct tours and/or to warn them or fine them when infractions are observed. This requires strong legal frameworks and a clear mandate for the enforcement agencies regarding the circumstances under which they can issue warnings, fines or more severe penalties like revoking whale watching licenses.
- *Lower cost alternatives*: The IWC Whale watching Handbook[53] also provides a summary of lower cost methods that can be used in areas where the logistics or costs of placing a vessel on the water among whale watching vessels on a daily basis are prohibitive:
    - An unpredictable rota of patrol presence once a week or once a month.
    - Land-based observations conducted from a viewpoint at the entrance to a bay or a cliff-top
    - Combining the role of registering and collecting fees for entry into the marine protected area, and the enforcing of appropriate conduct.
    - The placement of observers on whale watching vessels to monitor compliance.

- *Encouraging increased compliance through monitoring and education*: Compliance with both legally enforceable and voluntary measures can be enhanced through education of both tour operators and clients[7,9,63]. Monitoring to ensure compliance with voluntary measures or certification schemes may be conducted by research or training organisations, as is the case with the ACCOBAMS HQWW Certification, or voluntary schemes like WhaleSense in the USA[7,60].

**Recommendations**

- *Ensure that legally enforceable regulations and/or certification schemes include clear definitions of the penalties that will be incurred if infractions/non-compliance occurs.*
- *Identify the stakeholders responsible for marine surveillance and/or who have a mandate to enforce the regulations, and ensure that they are well-informed about whale watching regulations, and the penalties for non-compliance.*
- *Collaborate with stakeholders to establish a systematic means of conducting surveillance, whether at sea, or through other low cost methods.*

## 8. Time/Area closures to provide additional protection

**Rationale**

In some settings, approach guidelines and limits on the number of vessels that can approach cetaceans may be considered insufficient to prevent potential negative impacts to the target population. This may be the case for particularly vulnerable populations, or those using geographically constrained habitats like inlets, bays, estuaries or reefs for critical life functions. For example, in nearshore habitats or bays where mothers nurse calves, or where populations rest in order to recover from energetically demanding activity, any level of vessel presence or human activity may be deemed likely to disturb critical life functions, and thus present an unacceptable risk the long-term well-being of the population[64,65]. Managers can protect these areas by creating no-go zones that are off limits to whale watching activities. These measures can be in place permanently, seasonally, or at certain times of day when animals are known to be engaged in activities that are essential to their health and survival[65,66].

**Tools and examples**

- *Defining critical areas/critical times for protection:* The design of effective time/area closure measures requires good data on cetacean distribution, habitat use and behaviour in order to understand which areas, seasons, and times of day host cetaceans engaged in activities that should not be disturbed[67,68]. If this is not available from existing studies, it may be necessary to conduct research to inform management (see Section 2 and Annex 1). Well-documented examples include the highly predictable use of inshore bays by spinner dolphins for resting in Hawaii[21,69] and in the Samadai Reef in the Egyptian Red Sea[26,70,71].

- *Clear boundaries and timing based on science:* Once areas of critical importance have been identified, stakeholders can collaborate to determine boundaries of areas that should be demarcated for time/area closures. Boundaries should be based on the ecology and behaviour of the cetaceans in question, but should also be obvious to industry stakeholders and those responsible for monitoring and enforcing measures (for example the interior of a bay as defined by a straight line from one headland to another)[53,65]. Zoning can be applied to allow different levels of human activity, in different portions of the defined area, as is the case in Samadai Reef Egypt[66]. If measures are seasonal, or tied to certain times of day, these should also be based on the animals' behaviour and movements and clearly designated in the management plan[72,73].
- *Monitoring and enforcement* are essential to make time-area closures effective (see Section 8). To encourage compliance and make it easier for enforcement agencies to recognise infractions, the chosen geographical boundaries and/or seasons or times of closures should be communicated clearly to users as well as those responsible for enforcing regulations

### Recommendations

- *Consider time-area closures for particularly vulnerable populations or geographically constrained areas where cetaceans regularly use habitat for critical life functions like nursing young or resting.*
- *Base the geographic boundaries and times of closures (whether seasonal or daily) on the animals' ecology and behaviour, but also make them simple and easy to understand and enforce.*
- *Communicate closures clearly to industry stakeholders and those responsible for enforcement.*

## 9. Promoting education and awareness raising

### Rationale

Multiple studies have shown that when whale watching tours include a structured educational elements, they can result in participants' increased environmental awareness and motivation to support conservation efforts[9,11,74-77]. It is this educational and awareness-raising element that is often considered the positive outcome that may counter-balance some of the acceptable levels of temporary disturbance that responsible whale watching activities can cause to target populations. Whale watching tours that do not include an educational element, even when they adhere to proscribed approach guidelines and other responsible practices, risk disturbing cetaceans without the positive offset of motivating their guests to help protect cetaceans and their habitats. Furthermore, research shows that tourists appreciate an element of education in their tours[78,79], and this can be used as a marketing strategy by tour operators. Provision of on-board education is a condition for obtaining and retaining a license to operate whale watching tours in Portugal, and is also a component of the ACCOBAMS HQWW Certificate.

### Tools and examples

- *On-board education:* The most common form of education associated with whale-watching tours is the presence of an on-board naturalist, guide or interpreter, who can share information about the

cetaceans being viewed, as well as other aspects of the marine and coastal ecosystem. On-board naturalists may undergo formal training, as is provided through the ACCOBAMS HQWW Accreditation scheme, or they may be vessel captains or ex-fishermen with a wealth of local ecological knowledge.

- *Structuring educational elements:* Education associated with whale watching is most likely to be effective in increasing participants' knowledge and environmental motivation if it is structured and supported by audio/visual resources – which can range from videos shown on very large vessels to laminated factsheets, maps, or illustrations for use on smaller open-decked vessels. A number of resources are available through the IWC Online Whale Watching Handbook: https://wwhandbook.iwc.int/en/downloadable-resources/resources-for-guides-and-educators Educational messages can start at the time that clients book a tour, and carry on through all stages of the tour itself and through post-tour communciation[80].
- *Partnerships with research organisations*: Researchers or students undertaking research on cetacean species can also make good naturalists guides[81]. Managers can consider encouraging collaborations that can have multiple benefits for tour operators (who can market themselves as having expert educators on board), guests (who will feel privileged to be learning from an expert in the field), and the researcher who will potentially be able to use data collected during whale watching tours for their study (see Section 10).

**Recommendations**

- *Encourage whale watching activities to include an element of education and awareness raising and consider making the provision of on-board education a condition to obtain and maintain a license to operate whale watching tours, or to gain certification (as is the case for the ACCOBAMS HQWW Certificate).*
- *Encourage the development of training programmes for on-board naturalists, as well as the development of effective communication/educational resources that can be available to whale watching guides in the relevant languages needed to communicate with tourists/guests.*

## 10. Whale watching as a platform of opportunity for scientific data collection

**Rationale**

Vessel-based cetacean research is costly, and systematically designed scientific surveys generally generate data that represents only a snapshot of cetacean distribution, behaviour, and group composition at the specific point in time that the survey was conducted. By contrast, whale watching are often run on a daily basis (or during peak seasons in some locations, even multiple times per day) providing more regular opportunities to observe cetaceans in their natural habitats than most research programmes could ever hope to gain through systematic surveys. Multiple studies have demonstrated the effectiveness of using whale-watching vessels as platforms of opportunity to collect cetacean data[81-91]. At the same time, whale

watching platforms are not suited for every type of research[92]. For example studies involving biopsy sampling, satellite tag deployment, or water/prey sampling, are all better conducted from dedicated survey vessels crewed only by trained scientists[53,92]. However data collected by vessel captains, on-board naturalists, or guests can include positional data and species identifications to provide insight into (seasonal) distribution[82,85,87,90,93,94]. If sightings data are accompanied by vessel tracks or 'survey effort' whale watching data can also provide insight into not only where the animals ARE seen, but also where they are NOT seen, or are less likely to be seen, providing more accurate insight into relative abundance, habitat use and/or hotspots[90]. On-board naturalists or tourists can also be encouraged to take photos that can be used in photo-identification studies, contributing to population assessments and understanding of individual whale or dolphin movements over time[81,95]. Together with awareness-raising, the data generated from whale watching tours can provide a positive offset to the potential disturbance that even responsibly conducted operations can cause to target populations.

### Tools and examples

- *Collection of data by vessel captains or on-board naturalists*: In some areas vessel captains or on-board naturalists collect data on cetacean sightings during whale watching activities. This can range from simple sightings logs, to more complex data including vessel tracks and/or photographs to be used in individual identification. The collection of this type of data is a requirement for licensing to provide whale watching tours in Portugal and for HQWW certification in the ACCOBAMS Area. The IWC Online Whale watching Handbook provides an overview of the types of data that are more easily collected from whale watching Platforms of Opportunity: https://wwhandbook.iwc.int/en/industry-support/contributing-to-science-and-conservation-1
- *Collaboration between researchers and whale watching tour operators*: In some places, formal collaborations between whale watching tour operators and research organisations has resulted in data that is used for publication in scientific journals and to guide conservation management, such as a collaboration between the Center For Coastal Studies and tour operators in the Gulf of Maine, USA[91]. The collaborations can involve the placement of a researcher on whale watching tours to collect data at the same time that he/she shares expertise with guests. Alternatively, operators can send their collected data to researchers for analysis and synthesis into reports or publications. In some settings, data collected can also include questionnaires to tourists to rate their satisfaction and/or test for potential increases in awareness following their tours[9,10,96-101].
- *Research-based tourism*: Some research groups also offer paying participants the opportunity to join cetacean surveys and help collect, enter, and analyse data. In this way, participants help to fund valuable research, while also expanding their knowledge and appreciation of wildlife research methods.
- *Use of Citizen Science apps*: On-board naturalists and/or clients on board whale watching tours can be encouraged to submit sightings, tracks and/or photographs to various citizen science Apps. Apps can be location/region-specific and designed to contribute to the understanding of local cetacean populations, or they can be global. Some Apps allow data to be forwarded to relevant local research groups, while others (e.g. Flukebook.org, or happywhale.com or https://www.inaturalist.org/) are global in scope.

**Recommendations**

- *Encourage the collection of cetacean sightings and photo identification data during whale watching tours, and consider making a minimum level of data collection a requirement for obtaining and retaining a whale watching license and/or obtaining certification (as is the case for the ACCOBAMS HQWW Certification programme).*
- *Encourage collaboration between researchers and tour operators to maximise the potential for robust data collection, analysis and application to adaptive management.*
- *Consider use of citizen science apps to facilitate data collection.*

# ANNEX 1: Table of methods used to assess and monitor the potential impacts of whale watching activities on cetacean populations

The table below provides an overview of the types of studies that have been conducted to monitor and measure the potential impact of whale watching activities on cetacean populations. The examples provided in the reference list are not exhaustive, but intended to provide some examples of peer-reviewed studies using each category of method.

| **Category of study** | **Research platforms** | **Indicator or measure of potential impact** | **References (correspond to final reference list)** |
|---|---|---|---|
| Behavioural responses linked to the presence of whale watching vessels | Observations of behaviour from research vessels, shore-based observation stations, tethered balloons, to observe actual whale watching vessels and reactions or experimental approaches and reactions | Changes in diving or surfacing patterns | 102-105 |
| | | Changes in swimming speed and direction | 28,105-107 |
| | | Changes in time spent feeding | 24,31,108,109 |
| | | Changes in time spent resting | 27,29,34,110 |
| | Passive acoustic monitoring or vessel-operated hydrophones | Changes in vocal behaviour | 58,111-113 |
| Modelling of how behaviour changes translate into potential long term impacts on fitness | Studies that measure behaviour changes above include modelling of long-term and cumulative effects persistent shifts in 'energy budgets' | Potential energy deficits accrued over time by decreased feeding or resting, or increased traveling or surface-active behaviour | 28,54,114-122 |
| Monitoring vessel behaviour around target species | Observations can be made from a research vessel, or land-based station, or by researchers (anonymously) placed on whale watching vessels | Rates of categories of vessel behaviour that fall within, or outside of established standards in terms of distance, speed, approaches to species or group categories that are off limits, etc. | 6,7,31,51,123-129 |
| Monitoring tourist perceptions of whale watching experiences | Interview surveys are conducted with tourists following their participation in whale watching tours. 'Before' and 'after' surveys can be used to measure knowledge gain or change in awareness or attitudes | Rates of satisfaction or dissatisfaction with elements of whale watching experiences, or changes in levels of awareness, knowledge or motivation after participating in whale watching | 9,11,75,96,97,101,130-132 |

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