

# **Contribution from the Secretariat of the International Whaling Commission to Part 1 of the Report of the United Nations Secretary General on Oceans and Law of the Sea**

## **Anthropogenic Underwater Noise**

The IWC was established in 1946 as an international agreement to regulate whaling and to provide for the conservation of whale stocks. The Commission has a membership of 87 Contracting Governments. The International Convention for the Regulation of Whaling contains an integral Schedule which sets out specific measures that the IWC has collectively decided are necessary to regulate whaling. In addition, the IWC co-ordinates and funds conservation work on many cetacean species. Through its Scientific Committee it undertakes extensive study and research on cetacean populations, develops and maintains scientific databases, and publishes its own peer reviewed scientific journal, the *Journal of Cetacean Research and Management*.

The work of the Commission and its sub-groups has increasingly considered a wide range of issues that are also addressed by UNCLOS, including anthropogenic underwater noise. The IWC has been discussing the impacts of noise on cetaceans since at least 2004, particularly through its Scientific Committee, including seismic surveys in 2005 (IWC, 2006), noise from shipping in 2008 (IWC, 2009), measurements of ambient noise and sound mapping (IWC, 2015) and masking in 2016 (IWC, 2017). More recently, anthropogenic sound was included as one of the priority threats set out in the IWC Conservation Committee Strategic Plan (<https://iwc.int/conservation-committee>) and the IWC Conservation Committee is currently developing its own work programme on this issue.

The IWC's Scientific Committee has recognised the pervasive nature of underwater noise in the marine environment and the inherent difficulties in assessing the behavioural impacts that such noise may cause.

In an overview in 2014, it agreed that increased efforts should be made to avoid, minimise and mitigate the adverse effects of anthropogenic noise on cetaceans. It especially: (a) recommended Governments to promote and facilitate the adoption of noise-reducing technology; (b) encouraged assessments of marine activities to incorporate noise to help reduce serious harm to cetaceans; (c) encouraged consideration of the development of noise exposure limits; (d) encouraged noise producers to release data on their activities, both completed and planned; and (e) stressed the importance of temporal and spatial management of noise generating activities in the context of mitigation and encouraged the identification of sensitive areas in which noise would be strictly managed.

In 2016 (IWC, 2017), the Scientific Committee noted compelling evidence that chronic anthropogenic noise is affecting the marine acoustic environment in many regions and recognised emerging evidence that compromised acoustic habitat can affect some cetacean populations adversely. It recommended that a lack of scientific certainty should not prevent governments taking action now to keep quiet areas quiet and noisy areas quieter.

This report briefly summarises the work and recommendations of the IWC to date. More detailed information can be found at <https://iwc.int/anthropogenic-sound> and in the reports of the relevant IWC Scientific Committee meetings and Workshops which are referenced below. Appendix 1 provides the most recent overview recommendations of the IWC Scientific Committee

## **1. Seismic Surveys**

The potential impacts of seismic surveys on cetaceans (and their prey) have long been of concern within and outside the IWC. The IWC Scientific Committee reviewed this as a priority in 2006, noting that obtaining access to seismic data is a challenge. The IWC Scientific Committee made a number of recommendations including that: (a) governments characterise future industry exploration plans in a regional or national context; (b) collection of data from seismic surveys should be standardised, transparent and ideally mandatory throughout the industry; (c) publicly available datasets should be developed to enable assessment of the global extent of both industry and academic seismic surveys; (d) action should be taken to implement management measures to protect cetaceans from intense noise. The need to improve existing seismic survey technology and develop alternative technologies to minimise the acoustic energy put into the system was also highlighted. The IWC Scientific Committee also recommended at that time that seismic surveys be designed to use only the amount of acoustic output required for the desired ecological objectives.

Subsequently, the IWC Scientific Committee endorsed the principles and guidelines paper for responsible seismic surveys developed by Nowacek *et al.* (2013)<sup>1</sup>. These incorporate all stages from design of surveys to implementation of monitoring and mitigation plans.

## **2. Noise from Shipping**

In 2010, the IWC Scientific Committee endorsed a 'simple' but ambitious target for reducing shipping noise by half within ten years and strongly recommended co-operation with IMO on this and other aspects of underwater noise pollution. The IWC participated in IMO discussions where it was recognised that scientific uncertainty as to the effects of noise should not preclude efforts towards developing quieting technologies for commercial ships and non-mandatory technical guidelines for reducing ship noise were agreed. The resulting Guidelines for the Reduction of Underwater Noise from Commercial Shipping to Address Adverse Impacts on Marine Life were adopted at the 66th meeting of the IMO Marine Environment Protection Committee in 2014 (MEPC.1/Circ.833). In 2016 (IWC, In Press), the IWC Scientific Committee recommended an approach to identify the noisiest ships, quantify their contribution to overall ocean noise and assign priority to replacing/modifying those ships that contribute disproportionately to ocean noise.

## **3. Sound Mapping and Related Issues**

The IWC, International Quiet Ocean Experiment (IQOE), NOAA, ONRG (Office of Naval Research Global), TNO (the Netherlands Organization for Applied Scientific Research) and Netherlands Ministry of Infrastructure and the Environment held a Workshop on Sound Mapping in 2014 (IWC 2015). The Workshop agreed on the usefulness of sound mapping technology to assist management agencies in addressing chronic and cumulative impacts of ocean noise on cetaceans. The Workshop also raised concerns about the absence of standardisations in measuring and monitoring parameters. The IWC Scientific Committee subsequently endorsed the Workshop report and its recommendations (some slightly modified). These highly technical recommendations related to noise generation, modelling and predictions can be found in IWC (2016).

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<sup>1</sup> A recent guide for managers based upon this can be found on the IUCN website: <https://portals.iucn.org/library/node/46291>

#### **4. Masking and Modelling Population Level Effects on Cetaceans**

In 2016 (IWC, 2017a), the IWC Scientific Committee held a workshop on 'Acoustic Masking and Whale Population Dynamics'. It was agreed that the impacts of increased ocean noise are largely chronic rather than acute, on a large rather than small scale, and occur across multiple species, with some populations likely losing large portions (>50%) of their acoustic habitats for many months of the year over many years. Population consequences are very difficult to quantify but for some species and areas (e.g. North Atlantic right whales in the western North Atlantic) there is good evidence that masking probably has some population consequences. Lack of good (and in some cases, any) data on parameters related to both noise and cetaceans are the key hindrance to modelling efforts to estimate population consequences. The IWC Scientific Committee (IWC, 2017b) endorsed the report of the Workshop and adopted several research recommendations to better understand and quantify masking effects of noise, highlighting the importance of acoustic habitat in cetacean conservation efforts. In order to integrate changes in acoustic habitat into population dynamics models, the IWC Scientific Committee recommended work to: (a) generate and provide the best estimates of all aspects of a model (e.g. functional links, parameters, sound field maps) along with associated measures of uncertainty; (b) develop models to address pertinent management questions about impacts and the effectiveness of mitigation to reduce ocean noise; and (c) use these models to construct hypotheses and explore uncertainty.

In addition to supporting relevant research, the IWC Scientific Committee also recommended that IWC Member Nations took ocean noise into account in a variety of contexts including:

- (1) continued co-operation with other organisations including IMO, CMS, ASCOBANS and ACCOBAMS;
- (2) keeping commitments to the Convention on Biological Diversity (Aichi Targets 7 and 11) and under the United Nations Sustainable Development Goals (Goal 14); and
- (3) supporting efforts of the IUCN Joint Species Survival Commission/World Commission on Protected Areas Task Force on Marine Mammal Protected Areas.

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## Appendix 1

### Summary of Recent IWC Scientific Committee Recommendations on Noise (SC66b meeting, June 2016, Bled, Slovenia)

With respect to noise issues in general, the Committee:

- (a) **agrees** that there is compelling evidence that chronic anthropogenic noise is affecting the marine acoustic environment in many regions and recognised emerging evidence that compromised acoustic habitat can affect some cetacean populations adversely;
- (b) **agrees** that the lack of scientific certainty should not hinder management actions to reduce ocean noise (or indeed other potential threats) and **recommends** that absence of scientific certainty should not prevent member nations from undertaking management efforts now to keep quiet areas quiet and make noisy areas quieter;
- (c) **agrees** that addressing ocean noise is essential to meet United Nations Sustainable Development targets with respect to reducing pollution and fully protecting 10% of coastal and marine areas;
- (d) **recommends** that the Commission develop a paper for submission to the IMO Marine Environment Protection Committee, providing an update of recent information related to the extent and impacts of underwater noise from shipping;
- (e) **recommends** the continued development of clear and concise statements and compelling audiovisual tools to convey the importance and impact of ocean noise; and
- (f) **recognises** that noise is one of many stressors whale populations face, and **recommends** mitigation of the most tractable stressors, such as noise, as a way to increase populations' resilience and improve their future prospects in the face of less tractable stressors, such as climate change.

In consideration of protected areas, the Committee **recommends** that efforts to finalise a process to identify 'Important Marine Mammal Areas' should include integration of information on anthropogenic noise into site selection and management, and where possible, reduce ocean noise levels in identified Important Marine Mammal Areas.

With respect to general acoustic work required to address noise issues, the Committee **recommends** that:

- (a) ship source characteristic data be evaluated, for example part of ambient noise measurement studies, to identify the noisiest ships and quantify their relative contribution to overall ocean noise;
- (b) ships that contribute disproportionately to ocean noise should be considered a priority for replacement or application of ship-quieting technologies;
- (c) further studies on the source-level speed relationship for a range of vessel types are undertaken; and

(d) Automatic Identification System (AIS) and source characteristic data are used to relate shipping density data to estimated loss of acoustic habitat from shipping noise.

The Committee also **endorses** the recommendations of the Workshop on Predicting Sound Fields: Global Soundscape Modelling to inform Management of Cetaceans and Anthropogenic Noise and offered specific technical recommendations about how best to accomplish shared goals with respect to generating reliable soundfield maps.

Noting cetacean dependence on listening to and producing sounds for their survival, the Committee:

- (a) **recommends** increased research and management consideration of the importance of acoustic habitat in cetacean conservation efforts;
- (b) **recommends** the set of research efforts be undertaken to better quantify the factors underlying masking in cetaceans and encourages further work on acoustic masking in small cetacean species;
- (c) **recommends** focussed research to quantify the relationship between reduction in acoustic space and reduction in prey intake;
- (d) **recommends** research that explores linkages between masking of sounds and the effect on other life functions than foraging;
- (e) **recommends** efforts to expand both statistical frameworks to predict population consequences of masking;
- (f) **recommends** that the report of the Acoustic Masking Workshop be conveyed to the Western Gray Whale Advisory Panel Noise Task Force to support a collaborative approach to noise management; and
- (g) **notes** that many 'quiet areas' are likely to be found in the less industrialised waters of the Southern Hemisphere and, therefore agrees that efforts are needed to involve more scientists from such areas in the Committee's ongoing work on ocean noise.

In response to information on noise received this year from other organisations, the Committee:

- (a) **welcomes** the US Government's Ocean Noise Strategy and **endorses** its acoustic habitat approach to ocean noise management; and
- (b) **expresses concern** about the number of problematic areas (with respect to noise) in the Mediterranean and **welcomes** this important work by ACCOBAMS; and
- (c) **notes** that ASCOBANS has developed Guidelines on underwater noise, including effective mitigation guidance for intense noise generating activities.

The Committee **notes** that there are large data gaps on cetacean responses to UAS/drones but recognises their potential to disturb or even harm marine mammals (e.g. by strike/collision). It **recommends**:

- (a) that researchers should incorporate consideration of possible impacts (e.g. behavioural reactions) into any proposed UAS study involving cetaceans;
- (b) that managers consider recreational use of UAS/drones, as well as commercial or research use, when developing regulations or guidelines for their use around cetaceans; and
- (c) that countries without a permitting system for UAS/ drones, develop a precautionary permitting system that considers cumulative effects of UAS operations and other means of approach (e.g. by vessel).