

Progressing prevention, mitigation and reduction of anthropogenic noise

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Introduction

Anthropogenic underwater noise can inflict irreversible damage to marine mammals, leading to temporary or permanent hearing loss, masking, habitat displacement and in some cases even death, with similar negative impacts for fish and invertebrates. Ocean noise sources generated by human activities can be divided into two main categories: ambient, continuous noise and intense, impulsive noise (Hildebrand, 2005; Simmonds et al., 2014). For the purpose of this poster, we have decided to place our focus on shipping (continuous noise) and seismic surveys (impulsive noise). This is owed primarily due to the consideration that both of these have direct and indirect implications for the climate. Maritime transport is responsible for approximately 2,9% of global greenhouse gas (GHG) emissions and seismic surveys employing airguns are predominantly undertaken to explore new hydrocarbon resources for its exploitation by the fossil fuel energy sector. Therefore, we explore whether conservation measures that reduce noise emissions for such activities also have a positive impact on reducing GHG emissions.

Impulsive and continuous underwater noise

Shipping - continuous noise:

- 15% of the loudest ships contribute more than 50% of the noise level of the entire shipping industry, with container ships accounting for highest noise levels (Veirs et al. 2016 & 2017).
- The environmental challenges associated with maritime transport can be solved or improved to a great extent by applying a combination of technical and operational measures, including removing the loudest vessels from the fleet, replace noise ships with quieter ones or port-based incentives.
- The most immediate and one of the most effective measure is **ship speed reduction**:
 - "Focusing quieting on the 10-15% of the noisiest container and cargo ships will go furthest in reducing overall shipping noise. Slow steaming, or reducing ship speed mainly to save fuel, from an average of 16 kts to 14 kts (12% speed reduction) probably reduced the overall broadband acoustic footprint by over 50%" (Weilgart in UNEP/CMS/COP13/Inf.9, 2019).

Speed reduction results in a multitude of environmental benefits:

- The Fourth IMO Greenhouse Gas Study has found that the "share of shipping emissions in global anthropogenic emissions of GHGs has increased from 2.76% in 2012 to 2.89% in 2018" (Fourth IMO GHG Study, 2020).
- The IMO Study has clearly identified speed reduction as one of the highest CO₂ abatement from now until 2030, which would also be applied at a low cost.
- A study conducted by R. Leaper (2019) came to the following conclusions when calculating the effects of 10% reduction in speed by the global fleet:
 - reduction of GHG emissions by ca. 13%
 - reduction of total sound energy (noise) from shipping by ca. 40%
 - reduction to the overall risk of a collision between large vessels and large cetaceans by around 50%

Therefore, the reduction of speed of transport vessels will be vital in achieving the IMO goal of reducing total annual GHG emissions from international shipping by at least 50% by 2050 compared to 2008, as well as reducing noise emissions and other air pollutants.

RECOMMENDATION:

- Promote to impose ship speed reduction in "specific sensitive areas, as described in the revised detailed Guidelines to address the impacts of anthropogenic noise on cetaceans in the ACCOBAMS Area" [ACCOBAMS Resolution 7.13]
- Promote the immediate implementation of speed reduction trials throughout the Mediterranean Sea.

Seismic surveys- impulsive noise:

- Noise from a single seismic airgun survey, used to locate oil and gas deposits under the sea floor, can blanket an area of over 300,000 km², raising background noise levels 100-fold (20 dB), continuously for weeks or months (IWC, 2005, 2007).
- Seismic surveys continue in many regions within the Mediterranean Sea, in particular in the southern Mediterranean. There is little indication that conservation and mitigation measures are applied as required based on the decisions adopted by the ACCOBAMS and CMS Parties.
- The [ACCOBAMS Follow Up] "Committee finds it appropriate to recall that ACCOBAMS Parties are bound, inter alia, to require impact assessment for allowing or prohibiting activities that may affect cetaceans or their habitat, such as offshore exploration and exploitation (see ACCOBAMS Annex 2, para. 1, c)" (ACCOBAMS MoP 7/2016/Doc 16, 2019, p.7).
- In addition, Range States need to align their biodiversity, economy and energy policies to meet the objectives set by the Paris Agreement (2015). As such exploration activities for hydrocarbon resources shall be questioned per se. France has already banned any further oil and gas exploration activities, with Spain soon to follow based on current draft legislation. Italy and Portugal have already temporarily put such activities on hold.

Impacts of Noise on Cetaceans

The impact of anthropogenic underwater noise on cetaceans include:

- Avoidance of important habitat, sometimes days to weeks
- Reduced feeding
- Decreased reproduction
- Masking (obscuring, obliterating of sounds of interest)
- Change in calling rate, potentially affecting mating,
- Disruption in migration
- Strong escape responses
- Hearing damage
- Stress (damage to immune and reproductive function)
- Death

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The international community takes action

In past decades, decision-makers have acknowledged the threats posed by anthropogenic underwater noise and have adopted a wide range of measures to curb the threat:

- Resolution 2.16 Assessment and Impact Assessment of Man-Made Noise
- Resolution 3.10 Guidelines to Address the Impact of Anthropogenic Noise on Marine Mammals in the ACCOBAMS Area
- Resolution 4.17 Guidelines to Address the Impact of Anthropogenic Noise on Marine Mammals in the ACCOBAMS Area (replaced by 7.13)
- Resolution 5.15 Addressing the Impact of Anthropogenic Noise
- Resolution 6.17 Anthropogenic Noise
- Resolution 7.13 Anthropogenic Noise (adopted revised "Noise Guidelines")

Other Multilateral-Environmental Agreements (MEAs), such as the Convention on the Conservation of Migratory Species of Wild Animals (CMS) have also taken action and adopted numerous Resolutions and Decisions. For instance, at the 12th Conference of the Parties (CoP) to the CMS in 2017, States adopted Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities providing regulators with tailored advice on appropriately managing ocean noise. Currently, a procedure has been endorsed at the 13th COP to develop Guidance for the application of Best Available Technology (BAT) and Best Environmental Practice (BEP) for shipping, seismic airgun surveying and pile driving activities.

KEY REQUIREMENTS ADOPTED WITHIN Decisions and Resolutions by the Parties to ACCOBAMS and CMS

- **Setting up requirements to avoid, minimize and mitigate adverse impacts of underwater noise on marine and coastal biodiversity.**
- **Setting up obligations to conduct environmental impact assessments.**
- **Specific considerations for management plans for protected areas to prevent and reduce noise emissions.**
- **Promote and employ Best Available Techniques (BAT) and Best Environmental Practice (BAP).**
- **Apply the ACCOBAMS Noise Guidelines contained in Resolution 7.13.**
- **Apply the CMS Guidelines to undertake environmental impact assessments prior to noise generating activities.**

SUMMARY:

- If properly implemented and rigorously applied the measures adopted by MEAs provide a sound basis for the protection of cetaceans. Efforts to prevent, mitigate and ultimately reduce anthropogenic underwater noise can only progress if existing measures are put into effect, including the following:

Shipping:

- Implement speed reductions in sensitive areas
- Set up and implement speed reduction trials throughout the Mediterranean.

Seismic surveys:

- Conduct stringent and transparent environmental impact assessments
- Impose a ban on the exploration of new hydrocarbon activities.
- Implement and apply the CMS and ACCOBAMS Guidelines.

RECOMMENDATION:

While the authors encourage an immediate ban of all hydrocarbon exploration activities, countries shall fully apply with the decisions adopted and make mandatory usage of the ACCOBAMS and CMS Guidelines (see CMS Res. 12.14 and ACCOBAMS Res. 7.13) relating to noise generating activities. This includes:

- Avoid key cetacean habitat and areas of cetacean density
- Reduce source levels
- Apply a precautionary approach
- Conduct an environmental impact assessment before granting noise-producing activities, e.g., seismic surveys

