



Ocean Noise and the Sustainable Development Goals

What is ocean noise?

Levels of anthropogenic (human generated) noise in the oceans are increasing at an alarming rate. In some ocean and inshore regions these noise levels have doubled every decade for the past 60 years^{1 2 3 4 5} and are posing a significant threat to marine ecosystems, marine animals and the future sustainability of our oceans.

Noise is generated by many human activities, including the military, coastal and offshore construction work, shipping, fishing operations and the oil and gas industry (e.g. seismic exploration). These intense sounds are flooding the underwater environment and causing a range of adverse effects in fish, invertebrates, turtles and marine mammals, including stress, avoidance behaviours that diminish feeding opportunities, hearing damage, and even death⁶. Many cases of whale strandings and mortalities have been linked to the noise generated by military activities⁷. A growing number of studies suggest that ocean noise poses a threat to global marine ecosystems and fisheries resources as the health, reproduction, behaviour and mortality of fish and invertebrates are negatively impacted. Studies have also shown that commercial fish catch rates drop substantially, with larger fish leaving an area coincident with noise events^{8 9 10 11 12 13 14} and that increased bycatch rates and decreased fish abundance have been observed in the presence of noise^{15 16 17}.

Many marine species have been shown to be impacted by anthropogenic ocean noise to some degree, including at least 24 species of cetacean, 3 seal species¹⁸, 61 species of fish and 26 species of invertebrates¹⁹.

Although noise is a recognised form of pollution, sources of noise in the marine environment are currently not regulated at an international level, even though resolutions and requests for action have been made within relevant intergovernmental fora; The Convention on Migratory Species (CMS) has passed a number of resolutions, including in 2017 adopting new global Guidelines for Environmental Impact Assessments (EIAs) for Marine-Noise generating Activities (CMS Guidelines)²⁰. Previous CMS resolutions have emphasised the need for Parties to take ocean noise into account in the management plans of marine protected areas (MPAs)²¹. In 2014 the Convention of Biological Diversity (CBD) passed a decision²² encouraging implementation of measures to avoid, minimise and mitigate the potential significant adverse impacts of anthropogenic underwater noise on marine and coastal biodiversity and proposed specific actions such as the development and transfer to quieter technologies, best practice guidelines, spatial risk assessments, impact assessments, and the consideration of ocean noise in spatial planning and in the management of marine protected areas (MPAs).

The International Maritime Organization (IMO) also acknowledges the adverse effects of shipping traffic noise and in 2014 developed Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life²³.

Despite the provision of this policy guidance, concrete action and implementation of these instruments is lacking and evidence of the potential negative impacts of ocean noise on fisheries and the threat this may pose to food security has not yet been acted upon.

Ocean noise and the Global 2030 Agenda for Sustainable Development

Central to the United Nation's 2030 Agenda for Sustainable Development are the 17 Sustainable Development Goals (SDGs)²⁴ which will shape national development plans until 2030.

OceanCare welcomes SDG14 to conserve and sustainably use the oceans and advocates for urgent action to be taken by all stakeholders to ensure achievement of its various targets. Increased consideration of the socioeconomic and cultural benefits of marine environment protection and the overarching interconnection between SDG 14 and the other SDGs is also strongly encouraged, particularly with regard to the wide range of ecosystem services that humans derive from the oceans.

Anthropogenic ocean noise is a threat to the protection of the marine environments and to the wildlife and humans who depend on it. Undermining efforts to achieve healthy, sustainable oceans and restore fish stocks, ocean noise has crucial relevance across several of the SDGs and should be considered and addressed through this framework as a harmful form of marine pollution. This briefing describes the relevance of ocean noise across the SDGs and OceanCare's recommendations for further action.

SDG 1: End poverty in all its forms everywhere

The commitment to eradicate poverty is an overarching objective of the SDG agenda²⁵ and it is clear that fisheries are of significant importance if this ambitious goal is to be achieved. An estimated 56.6 million people around the world depend on the fisheries and aquaculture sector as a full or part time source of income and livelihood, according to 2014 figures²⁶. Small scale fisheries play a critical role in supporting livelihoods and reducing poverty for the millions of people living in coastal communities²⁷. However, the world's marine fisheries have been on a trend of decline since 1996²⁸, creating a threat to both food and income security for millions of people.

The impacts of ocean noise on fish are likely to add to the problem. Research demonstrates that fish are displaced by sound events, and that their migration, schooling and other movement patterns, as well

as reproductive factors, are also disrupted^{29 30 31}. Studies have also demonstrated negative impacts on commercial invertebrates including shrimps, crabs and lobsters^{32 33}.

SDG 2: End hunger, achieve food security and improve nutrition and promote sustainable agriculture

It is likely that as noise levels in the ocean increase, so too will the negative impacts on marine resources that human's depend on for food. Some studies have shown catch rates of certain species of fish to drop by 40-80 per cent near seismic surveys^{34 35 36}. By 2050 it is estimated that there will be more than 9.7 billion people to feed globally³⁷ and with fisheries already on a downward decline, the added adverse effects caused by ocean noise must be systematically addressed.

The UN General Assembly has recognised this potential threat to marine resources in Sustainable Fisheries Resolution (A/RES/68/71) which encourages the Food and Agriculture Organization of the United Nations (FAO) to conduct studies on the impacts of ocean noise on fish stocks and fish catch rates, as well as associated socioeconomic effects³⁸.

SDG 8: Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all

As fish continues to be one of the most traded food commodities worldwide, with more than half of fish exports by value originating in developing countries³⁹, the potential threat that ocean noise poses to marine resources should not be ignored.

Fisheries are not the only area where ocean noise may impact economic growth and employment. SDG target 8.9 focuses on the need to promote sustainable tourism in order to create jobs and promote local culture and produce⁴⁰. Whale watching is now a huge and growing form of eco-tourism worldwide with over 13 million people a year taking a whale watching trip in an industry spanning 119 countries and overseas territories, generating \$2.1 billion in total revenues. An estimated 3,300 operators offer whale watching

trips around the world, employing an estimated 13,200 people⁴¹. When conducted responsibly and sustainably, whale watching presents an economic opportunity for many coastal communities around the world. As the whale watching industry depends on healthy populations of whales and dolphins and the reliability of their movements, the threat caused by the potential for ocean noise to displace cetaceans should be viewed as a socioeconomic, as well as biodiversity risk.

SDG 9: Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation

Increased industrialisation and globalisation have been key factors in the rising levels of ocean noise, for example oil and gas developments and increased ocean traffic. Addressing the ocean noise issue whilst maintaining economic growth will require increased focus on the role of technology and innovation as part of the solution. For example, governments should stipulate the development and use of alternative technologies for oil and gas exploration whilst increasing efforts to switch to green energy sources and all technologies used for extracting renewable energy from the sea should be checked independently for their environmental impact. Efforts also need to be made to improve ship design to reduce noise output as well as provide a level playing field for shipping companies for reducing speed which results in lower sound and fuel emissions. However, technology and innovation must be accompanied by policies and management measures based on the precautionary approach and increased focus on incorporating ocean noise into marine spatial planning and the management of marine protected areas. Environmental Impact Assessments (EIAs) are a crucial tool in assessing the sustainability of activities which may generate noise and the recently adopted CMS Guidelines have been developed to assist States in carrying out such assessments.

SDG 13: Take urgent action to combat climate change and its impacts

Climate change is now recognised as the biggest global threat to sustainable development and the 2015 Paris Agreement sets the stage for ambitious

climate action to keep global temperatures from rising no more than 2 degrees Celsius above pre-industrial levels and to pursue further efforts to limit the rise to 1.5 degrees Celsius. It is recognised that a move towards cleaner energy sources is crucial if these targets are to be achieved. Since the oil and gas industries also represent significant sources of harmful ocean noise, efforts to move away from oil and gas would be beneficial in tackling both climate change and ocean noise pollution. Warmer temperatures and increased accessibility of humans to the Arctic are already leading to an increase in oil and gas exploration and extraction which is increasing the threat of ocean noise for all the marine wildlife dependent on these crucial habitats for survival⁴². It is important to note that climate change is also changing the way in which the ocean carries sound. Studies conducted in the Arctic have found that sound can now travel about four times further than it could a decade ago^{43,44}. This change is thought to be connected to warmer layers of sea ice allowing for the faster travel of sound waves.

SDG 14: Conserve and sustainably use the oceans, seas and marine resources for sustainable development

SDG target 14.1 states: 'By 2025, prevent and significantly reduce marine pollution of all kinds⁴⁵'. The United Nations Convention on the Law of the Sea (UNCLOS) defines pollution of the marine environment as '...the introduction by man, directly or indirectly, of substances or energy into the marine environment including estuaries which results, or is likely to result in such deleterious effects as harm to living resources and marine life, hazards to human health, hindrance to marine activities including fishing and other legitimate uses of the sea, impairment of quality for use of sea water and reduction of amenities⁴⁶'. It is clear that ocean noise can and should fit into this definition as 'energy' and therefore be addressed as a form of marine pollution within the SDGs.

A failure to adequately address anthropogenic ocean noise would also be a failure to achieve SDG target 14.2 and 14.5 which relate to sustainably managing and protecting marine and coastal ecosystems to avoid significant adverse impacts, achieving healthy and productive oceans and conserving at least 10 per cent of coastal and marine habitats⁴⁷. Numerous calls have been made within intergovernmental fora such as CMS and CBD to take ocean noise into account within management plans of marine protected areas.

Anthropogenic ocean noise may interact cumulatively or synergistically with other noise sources, or with other threats facing marine life⁴⁸. Noise can cause effect over huge distances, and measures being taken to restore fish stocks in the shortest time feasible (SDG14.4) such as the implementation of ‘no-fishing zones’ may be undermined if simultaneous efforts are not made to address sources of ocean noise.

Recommendations

Ocean noise can be addressed through twelve key actions. Government decision-makers should:

1. Include specific language in the United Nations General Assembly Oceans Resolution, Sustainable Fisheries Resolution, and within domestic legislation, to explicitly recognise ocean noise as a serious and pervasive form of transboundary pollution to be mitigated and addressed.
2. Progress a global strategy that seeks to reverse the trend of rising ocean noise levels.
3. Support the incorporation of measures to manage ocean noise into the new international legally binding instrument on the conservation and sustainable use of marine biological diversity of areas beyond national jurisdiction under the UN Convention on the Law of the Sea.
4. Recognise ocean noise as a form of marine pollution to be addressed under Sustainable Development Goal 14.1 which seeks to prevent and significantly reduce marine pollution of all kinds by 2025.
5. Adopt a precautionary approach, by carefully assessing all future ocean noise-generating activities and legislating for Best Available Technology and Best Environmental Practice to be used for any activities given approval.
6. Transpose the International Maritime Organization Ship Quieting Guidelines and the Convention on Migratory Species Guidelines on Environmental Impact Assessments for Marine Noise-generating Activities into domestic legislation.
7. Implement monetary and management measures which allow for a transition from fossil fuels.
8. Require robust, comprehensive and transparent Environmental Impact Assessments prior to approval of applications for noise-generating activities to take place.
9. Ensure regulators and decision-makers have robust, defensible, and impartial information on which to base their decisions about ocean noise-generating activities.
10. Take into account previous, simultaneous, on-going, and planned activities in the same or adjoining areas of proposed ocean noise-generating activities to consider potential cumulative or synergistic impacts.
11. Establish ‘quiet zones’, using scientific advice contained in Areas of Interest for Important Marine Mammal Areas and Ecologically or Biologically Significant Marine Areas to assist with prioritising where to focus efforts.
12. Support and encourage the Food and Agriculture Organization to conduct studies on the impacts of ocean noise on fish, invertebrates and fish catch rates, as well as associated socioeconomic effects.

Achieving protection of the oceans and marine life from the threat of anthropogenic ocean noise requires critical action from a range of stakeholders. OceanCare’s Voluntary Commitments to drive and support progress on ocean noise as part of the 2030 Agenda for Sustainable Development can be found here: [#OceanAction16030, https://oceanconference.un.org/commitments/?id=16030](https://oceanconference.un.org/commitments/?id=16030)

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