

## **OceanCare contribution on the topic of focus of the fifteenth round of Informal Consultations of States Parties to the United Nations Fish Stocks Agreement: Implementation of an Ecosystem Approach to Fisheries Management**

February 24 2020

We thank you for the invitation to contribute on the topic of focus of the 15th round of Informal Consultations of States Parties to the United Nations Fish Stocks Agreement.

Referring to “Resolution 74/18.Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments” (UNGA 2019) and in particular paragraphs

*40.Calls upon States to consider the potential environmental and socioeconomic impacts of anthropogenic underwater noise from different activities in the marine environment and to address and mitigate such impacts, taking into account the best available scientific information, the precautionary approach and ecosystem approaches, as appropriate;*

*222.Encourages further studies, including by the Food and Agriculture Organization of the United Nations, on the impacts of underwater noise on fish stocks and fishing catch rates, as well as associated socioeconomic effects;*

OceanCare would like to address underwater noise pollution under the section: “incorporating environmental factors affecting marine ecosystems...” (Section (i), d) of the 23 Jan. 2020 invitation letter to NGOs).

OceanCare has worked with the UN DOALOS, FAO and the GFCM on the issues of ocean noise pollution and plastic pollution since 2004, 2009 and 2015, respectively. While fisheries practices undoubtedly affect the health of fished populations to a greater degree, maintaining overall marine ecosystem productivity and function is essential for all life forms, including humans and their fisheries.

In a report commissioned by OceanCare, 115 primary scientific studies, encompassing various human-produced underwater noise sources, 66 species of fish, and 36 species of invertebrates, were reviewed (Weilgart 2018).

As most fish and invertebrates use sound for vital life functions, it is not surprising that many impacts due to ocean noise pollution were documented. Noise impacts on development include body malformations, higher egg or immature mortality, developmental delays, delays in metamorphosing and settling, and slower growth rates.

Zooplankton suffered high mortality in the presence of noise. Anatomical impacts from noise involve massive internal injuries, cellular damage to statocysts and neurons, causing disorientation and even death, and hearing loss. Damage to hearing structures can worsen over time even after the noise has

ceased, sometimes becoming most pronounced after 96 hrs. post-noise exposure. Even temporary hearing loss can last months.

Stress impacts from noise are not uncommon, including higher levels of stress hormones, greater metabolic rate, oxygen uptake, cardiac output, parasites, irritation, distress, and mortality rate, sometimes due to disease and cannibalism; and worse body condition, lower growth, weight, food consumption, immune response, and reproductive rates. DNA integrity was also compromised, as was overall physiology.

Behaviorally, animals showed alarm responses, increased aggression, hiding, and flight reactions; and decreased anti-predator defense, nest digging, nest care, courtship calls, spawning, egg clutches, and feeding. Noise caused more distraction, producing more food-handling errors, decreased foraging efficiency, greater vulnerability to predation, and less feeding. Schooling became uncoordinated, unaggregated, and unstructured due to noise. Masking reduced communication distance and could cause misleading information to be relayed.

Some commercial catches dropped by up to 80% due to noise, with larger fish leaving the area. Bycatch rates also could increase, while abundance generally decreased with noise. Ecological services performed by invertebrates such as water filtration, mixing sediment layers, and bio-irrigation, which are key to nutrient cycling on the seabed, were negatively affected by noise. Once the population biology and ecology are impacted, it is clear fisheries and even food security for humans are also affected.

Turtles, sharks, and rays were especially underrepresented in noise impact studies. Research on an individual's ability to survive and reproduce, and ultimately on population viability and ecosystem community function, is most vital. More long-term, realistic field studies also considering cumulative and synergistic effects, along with stress indicators, are needed (Weilgart 2018).

### **Management and mitigation recommendations**

The report (Weilgart 2018) listed a number of management and mitigation recommendations regarding ocean noise pollution:

1. Promote and further airgun alternatives and quieting technologies, such as Marine Vibroseis, which is thought to lower particle motion acceleration as well as peak pressure. Also work to reduce vibration through the seabed.
2. All noise sources should avoid biologically important areas (e.g. spawning grounds, nursery areas, important foraging habitat) and times of year, such as spawning. Dawn or dusk fish choruses should preferably also be avoided. A recovery period for females immediately after spawning should be allowed, as females tend to be in very poor body condition at this time. Shipping lanes could be rerouted to avoid important fish and invertebrate habitat.
3. Reduce commercial shipping and fishing vessel noise (e.g. dragging) through technological innovation or quieter operation (e.g. slow steaming). Ships should avoid routes immediately parallel to the continental shelf as noise can more easily enter the deep sound channel, travelling very efficiently for large distances.
4. Vessels in port should avoid using their generators and use shore power instead to reduce biofouling which adds to shipping noise and introduces invasive species. Noise insulation and dampening of engines and generators should also occur.

5. Reduce recreational boat noise and promote quieter, surface-piercing drives such as Arneson drives, as appropriate. Four-stroke outboard engines appear less impactful to some marine species compared with two-stroke engines.
6. Dynamic Positioning (DP) is extremely loud and is often used by supply ships, among other vessels. Alternative operation or technologies should be promoted.
7. All sonars, echosounders, and multibeamers should use frequencies above at least 200 kHz.
8. The required, involuntary activation of echosounders on recreational boats upon turning on the engine should be abolished. This appears to be the case for newer boats, where the GPS immediately activates the echosounder and it cannot be turned off.
9. Reduce pile driving or construction noise through the water and vibration through the seabed. Alternative foundations such as suction caissons or gravity-based foundations may effectively eliminate noise during construction. Quieter, new installation methods should be explored and promoted.
10. Naval sonar should also be kept away from biologically rich and productive areas. Dipping sonar seems to be particularly problematic for marine mammals and may also be for fish and invertebrates as there is no possibility of habituation.
11. Noise impacts should be incorporated into population modelling for fish and invertebrates.
12. Geophysical surveys of all kinds (including seabed mapping) should be required to use the lowest
13. possible source level.
14. Thorough Environmental Impact Assessments need to be completed for all noise activities having the potential to cause impacts. Analyses of the impacts on fish and invertebrates need to be included.
15. Marine Protected Areas should be managed with noise in mind, including acoustic buffer zones.
16. Acoustic refuges of still-quiet biologically important areas for noise-sensitive marine life should be safeguarded and protected from noise.
17. The unproven assumption that all marine life will avoid noise must be jettisoned. Many species and individuals do not consistently avoid even damaging noise, if the area is important to them. Even if animals avoid noise, this is a costly behavior in terms of: a) lost foraging time; b) the energetic costs of transiting and interrupted feeding; and c) increased predation and less efficient foraging in areas that are not as well known.

A joint GFCM (General Fisheries Commission for the Mediterranean)/OceanCare Workshop on Anthropogenic Underwater Noise and Impacts on Fish, Invertebrates and Fish Resources (WKNOISE) was held at FAO Headquarters in Rome (Italy) on 21-22 February 2019. The main objectives of the workshop were to: i) review reported anthropogenic underwater noise effects on fish and invertebrates; ii) identify areas in the GFCM area of application where fishing is restricted but other human activities, in particular anthropogenic underwater noise, could impact fish stocks with respective socio-economic consequences; iii) address the prevention of these impacts on fish and their prey, including through Environmental Impact Assessments; iv) discuss recent developments within UNCLOS in connection with transboundary pollution in the high seas; v) address the relevance of anthropogenic underwater noise in the context of a study on socio-economic impacts on Mediterranean fish stocks (GFCM/OceanCare 2019).

## Conclusions and Recommendations of the Joint GFCM/OceanCare Workshop

The Workshop agreed on the following conclusions:

1. Coordination with CMS, CBD, IMO – and other relevant international organizations – should be fostered by the GFCM to ensure coherence in the implementation at the regional level of existing policies addressing, *inter alia*, the impacts of anthropogenic underwater noise on marine biodiversity;
2. Multi-sectoral Strategic Environmental Assessments (SEAs) and Environmental Impact Assessments (EIAs) conducted should be examined by GFCM contracting parties and cooperating non-contracting parties (CPCs) so that the impacts of anthropogenic underwater noise, including cumulative and synergistic impacts on marine biodiversity, especially those affecting fisheries, be adequately addressed and monitored;
3. CPCs should make all efforts to comply with recommendations adopted by the GFCM on the establishment of fisheries restricted areas, including recommendation GFCM/30/2006/3, and, to this end, ensure, to the extent possible, coordination among relevant national authorities to protect these areas from the impacts of anthropogenic underwater noise (e.g. seismic surveys);
4. Potential impacts of anthropogenic underwater noise on marine biodiversity, especially those affecting fisheries, should be taken into consideration by the GFCM – through its Scientific Advisory Committee on Fisheries (SAC) – in coordination with relevant organizations (i.e. UNEP/MAP, ACCOBAMS, etc.) to the best extent possible;
5. A study on the impacts of anthropogenic underwater noise on fish stocks and fishing catch rates, as well as associated socio-economic effects, in the GFCM area of application should be carried out, consistent with the calls by the UN General Assembly; this study would be prepared by GFCM and OceanCare, in coordination with other relevant regional organizations, and would be submitted to the SAC for consideration by CPCs (GFCM/OceanCare 2019).

### **Cooperation and Collaboration in support of the Ecosystem Approach to address Underwater Noise:**

Given the transboundary nature of underwater noise pollution, coordination among relevant national authorities to protect ecosystems and resources in affected areas from the impacts of anthropogenic underwater noise is essential. International and inter-governmental coordination is necessary, as well as individual national and regional approaches are not sufficient to effectively manage, in a fully-encompassing manner, the cumulative impacts from transboundary pollution, including anthropogenic underwater noise pollution. Horizontal mechanisms help to promote joint and synergic actions as well as foster linkages between international and regional policies to better manage and protect ecosystems from transboundary threats, such as underwater noise.



## References

GFCM/OceanCare. 2019. Joint GFCM/OceanCare Workshop on Anthropogenic Underwater Noise and Impacts on Fish, Invertebrates and Fish Resources, FAO headquarters, Rome, Italy, 21-22 February. Available at: <http://www.fao.org/gfcm/technical-meetings/detail/en/c/1194253/>

UNGA. 2019. UNGA Resolution 74/18. Sustainable fisheries, including through the 1995 Agreement for the Implementation of the Provisions of the United Nations Convention on the Law of the Sea of 10 December 1982 relating to the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks, and related instruments. Available at: <https://undocs.org/en/A/RES/74/18>

Weilgart, L. 2018. The impact of ocean noise pollution on fish and invertebrates. Report for OceanCare, Switzerland. 34 pp. Available at: [https://www.oceancare.org/wp-content/uploads/2017/10/OceanNoise\\_FishInvertebrates\\_May2018.pdf](https://www.oceancare.org/wp-content/uploads/2017/10/OceanNoise_FishInvertebrates_May2018.pdf)

For further information please contact:

Fabienne McLellan, Co-Director International Relations - [fmclellan@oceancare.org](mailto:fmclellan@oceancare.org)

Nicolas Entrup, Co-Director International Relations - [nentrup@oceancare.org](mailto:nentrup@oceancare.org)

Sigrid Lüber, President – [slueber@oceancare.org](mailto:slueber@oceancare.org)

## About OceanCare:

OceanCare is a Swiss non-profit organisation. It was founded in 1989 and has a strong commitment to realistic and cooperative initiatives. The organisation works at national and international level in the areas of marine pollution, environmental changes, fisheries, whaling, sealing, captivity of marine mammals and public education.

OceanCare holds Special Consultative Status with the Economic and Social Council of the United Nations (ECOSOC) and is a partner of the General Fisheries Commission for the Mediterranean (GFCM), the Convention on Migratory Species (CMS), and the UNEP/CMS Agreement on the Conservation of Cetaceans in the Black Sea, Mediterranean Sea and Contiguous Atlantic Area (ACCOBAMS), as well as UNEP/MAP. OceanCare has also been accredited as a Major Group to the United Nations Environment Assembly (UNEA), which is the governing body of UNEP, and is a part of the UNEP Global Partnership on Marine Litter. [www.oceancare.org](http://www.oceancare.org)