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Agenda Item 25.2.2

UNDERWATER NOISE

(Prepared by the Secretariat and the Joint Noise Working Group of CMS, ACCOBAMS and ASCOBANS)

Summary:

This document reports on progress to implement Decision 14.44–14.47 *Marine Noise* and Resolution 12.14 *Adverse Impacts of Anthropogenic Noise on Cetaceans and Other Migratory Species,* and contains draft Decisions for adoption.

The attached draft Decisions would support the achievement of Targets 1.1–1.3, 3.3, 4.1 and 5.3 of the Samarkand Strategic Plan for Migratory Species 2024-2032.

UNDERWATER NOISE

Background

1. COP12 (2017) adopted Resolution 12.14 *Adverse Impacts of Anthropogenic Noise on Cetaceans and Other Migratory Species*. It also endorsed the *CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities* annexed to the Resolution. Other technical guidelines on marine noise previously published by CMS include the Technical Series No.46 *Best Available Technology (BAT) and Best Environmental Practice (BEP) for Mitigating Three Noise Sources: Shipping, Seismic Airgun Surveys*, *and Pile Driving* (2023).

2. COP14 adopted the following Decisions on this issue:

Decision 14.44 Directed to the Parties

Parties are requested to:

a) disseminate the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities to all national departments involved in deciding on noise-generating activities and encourage their application;

b) through the Secretariat, inform the Scientific Council at the 7th meeting of the Sessional Committee about experiences and lessons learned in the application of these Guidelines, and the need for additional guidance on assessment and mitigation of marine noise;

c) support the Secretariat in securing the external expertise required to update the Technical Support Information, prepare a gap analysis and identify further needed guidance, as well as to develop a report on available information on the impact of noise and the potential need for guidance regarding freshwater cetacean species;

d) make use of Technical Series No. 46 Best Available Technology (BAT) and Best Environmental Practice (BET) for Mitigating Three Noise Sources: Shipping, Seismic Airgun Surveys and Pile Driving and bring it to the attention of appropriate regulatory bodies concerned with marine spatial planning and licencing processes relating to underwater noise-generating activities; and

e) provide information on the implementation of Resolution 12.14 through National Reports.

Decision 14.45 Directed to the Joint Noise Working Group of CMS, ACCOBAMS and ASCOBANS

The Joint Noise Working Group of CMS, ACCOBAMS and ASCOBANS is requested, subject to the availability of external resources, to:

a) provide a peer review of the updated Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities;

b) prepare a gap analysis of guidance available from CMS and other forums and identify where further guidance is needed on mitigation of the effects of marine noise in order to address the needs of migratory species and their prey;

c) prepare a report on the state of knowledge of noise impacts and noise mitigation measures for CMS-listed freshwater mammal species and assess the need for specific guidance for freshwater habitats; and

d) report to the Scientific Council at the 8th meeting of its Sessional Committee on the progress in implementing this Decision.

Decision 14.46 Directed to the Scientific Council

The Scientific Council is requested to:

a) provide advice to the Secretariat and Joint Noise Working Group as to where to focus efforts to support the implementation of mitigation measures;

b) provide advice on the future role of the Convention to ensure timely and effective guidance continues to be given to governments and other stakeholders, making use of and building upon related work in other forums;

c) consider the recommendations of the Joint Noise Working Group regarding the need for the development of further guidance on mitigation of the effects of marine noise, including on specific guidance regarding freshwater cetacean species, and facilitate their development accordingly, with a view to presenting any outputs to the 15th meeting of the Conference of the Parties; and

d) subject to the availability of external resources, in collaboration with the Joint Noise Working Group, and, where relevant, with competent national authorities, assess the application and effectiveness of existing guidance regarding impact of military sonar and other sound sources generated by military activities on migratory species and to investigate whether further guidelines may be needed to address and mitigate these impacts.

Decision 14.47 Directed to the Secretariat

The Secretariat shall, subject to the availability of external resources,

a) share Technical Series No. 46 Best Available Technology (BAT) and Best Environmental Practice (BET) for Mitigating Three Noise Sources: Shipping, Seismic Airgun Surveys and Pile Driving with other appropriate regional and international organizations to strengthen collaborative efforts to reduce underwater noise emissions;

b) facilitate an update of the Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities;

c) publish the updated Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities as a Technical Series to make it easily accessible to Parties and other stakeholders;

d) in collaboration with the Joint Noise Working Group, continue providing up-to-date information on the CMS website on marine noise to assist Parties and other stakeholders in effective mitigation of impacts of underwater noise on marine species;

e) support the Joint Noise Working Group in developing the requested reports and any further guidance on mitigation of the effects of marine noise, as required; and

f) request information from Parties about experiences and lessons learned in the application of the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities, and the need for additional guidance on assessment and mitigation of marine noise, in time for consideration by the 7th meeting of the Sessional Committee of the Scientific Council.

Update of the Technical Support Information

3. Due to the short intersessional period and absence of available funding, the Secretariat was unable to facilitate the update of the *Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities*[1] foreseen in Decisions 14.45 (a) and 14.47 (b) and (c).

4. However, the Government of Australia informed the Secretariat of its work on National Anthropogenic Underwater Noise Guidelines, noting that these, once published, might

[1] Available here: https://www.cms.int/en/guidelines/cms-family-guidelines-EIAs-marine-noise

satisfy the needs of the Parties, except where freshwater is concerned. The Australian National Anthropogenic Underwater Noise Guidelines should therefore be reviewed by the Joint Noise Working Group (JNWG) when they become available, to determine whether an update of the Technical Support Information is still required.

Activities of the Joint Noise Working Group of CMS, ACCOBAMS and ASCOBANS

5. The JNWG was requested to provide feedback on several projects, including the OSPAR Regional Action Plan on Underwater Noise, the TOR for the Joint ACCOBAMS-ASCOBANS Workshop with Navies on Underwater Noise and Cetaceans, the report on Noise Impacts and Noise Mitigation for CMS-listed Freshwater Mammal Species and their Prey (see below), and the ACCOBAMS Noise Hotspot Report II. Additionally, several JNWG members contributed to the discussion on setting noise thresholds for cetacean habitats at the ACCOBAMS workshop on the EU QUIETSEAS project. The JNWG has further contributed to a compilation of noise criteria used by Parties for regulatory purposes, as was requested by the Steering Group for the ASCOBANS Conservation Plan for Harbour Porpoise in the North Sea (North Sea Group). The criteria were reported at the 13th meeting of the North Sea Group in April 2025, as contained in ASCOBANS/NSG13/Doc.4.2. A more complete version is included in the NSG13 report.

6. Due to the short intersessional period and absence of available funding, it was not possible to provide the analysis of gaps in guidance available from CMS and other forums on mitigation of effects of marine noise.

7. The Work Plan for the Joint Noise Working Group of CMS, ACCOBAMS and ASCOBANS has been updated following the adoption of new mandates by CMS, ACCOBAMS and ASCOBANS. It is contained for information in Annex 1. COP15 mandates will be included following their adoption. The latest version of the Work Plan is always available at https://www.cms.int/en/topics/marine-noise.

Report on the State of Knowledge of Noise Impacts and Noise Mitigation Measures for CMS-listed Freshwater Mammal Species and their Prey

8. In accordance with Decision 14.45 c) and 14.47 e), the Secretariat prepared a report on the current state of knowledge of noise impacts and noise mitigation measures for CMS-listed freshwater mammal species and the need for specific guidance for freshwater habitats, with funding provided by the Government of Australia.

9. All ten CMS-listed freshwater mammal species and their prey are considered, and an overview is given of noise mitigation measures that work in estuaries, rivers and lakes. The report examines the applicability of existing guidance on noise mitigation measures, which are generally more focused on the marine environment, and makes recommendations for measures that can be used to inform improved guidance on noise mitigation for CMS-listed freshwater mammal species and their prey.

10. A summary and analysis have been included in Annex 2, and the full report, which has been reviewed by the JNWG and the ScC Aquatic Mammals Working Group, can be found in UNEP/CMS/COP15/Inf.25.2.2.

Impact of sound sources generated by military activities

11. The assessment of the application and effectiveness of existing guidance regarding impact of military sonar and other sound sources generated by military activities on migratory species (Decision 14.46 (d)) was not carried out due to lack of funding. Although the Government of France contributed funding, co-funding from other Parties would be required to carry out this assessment.

Dissemination of guidelines and information

12. The Secretariat sent out Notification 2024/012: Marine Noise to Parties on 3 June 2024 to disseminate the *CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities*, and to request support in securing the external expertise required to support the JNWG with the implementation of some of its mandates.

13. In accordance with Decision 14.47 f), the Notification requested Parties to share experiences and lessons learned in the applications of these Guidelines, and the need for any additional guidance on assessment and mitigation of marine noise. Two submissions were received from Parties, Italy and the Dominican Republic, and were presented to ScC-SC7 as Inf.14 Responses to Decision 14.44 on Marine Noise.

14. The Notification also reminded Parties to make use of *Technical Series No. 46 Best Available Technology (BAT) and Best Environmental Practice (BET) for Mitigating Three Noise Sources: Shipping, Seismic Airgun Surveys and Pile Driving,* and bring it to the attention of appropriate regulatory bodies concerned with marine spatial planning and licencing processes relating to underwater noise-generating activities.

15. The Secretariat has updated the Marine Noise webpage to include the *Technical Series No. 46 Best Available Technology (BAT) and Best Environmental Practice (BET) for Mitigating Three Noise Sources: Shipping, Seismic Airgun Surveys and Pile Driving*, as well as other updated information.

Discussion and analysis

16. Underwater noise continues to be an issue of major concern for migratory marine species and their prey, as well as for freshwater mammals. The report on noise impacts and mitigation for freshwater mammals is an important first step in addressing one of the gaps: the impact of noise in freshwater ecosystems. Since noise affects species beyond the marine environment and CMS mandates now also include noise in freshwater environments, this document uses the more general term ‘underwater noise’ to include both marine and freshwater environments.

17. Proactive steps are needed by all relevant stakeholders to achieve the innovation and adjustment needed for more substantive reductions of negative impacts from noise on marine and freshwater species and their habitats in order to maintain or restore the health of aquatic ecosystems. This requires an analysis of gaps in guidance available from CMS and other forums, enabling the Scientific Council, with support from the JNWG, to identify where further guidance is needed when considering the specific needs of migratory species and their prey.

18. The draft Decisions in Annex 3 reflect both the new and continued avenues for future work to improve understanding of noise sources, impacts and mitigation measures for migratory species in both marine and freshwater habitats.

Recommended actions

19. The Conference of the Parties is recommended to:

a) note the Work Plan for the Joint Noise Working Group contained in Annex 1 of this document;

b) note the summary and recommendations of the report on *Anthropogenic Underwater Noise Impacts and Mitigation Strategies for CMS-Listed Freshwater Mammals (Cetaceans, Sirenians, Otters) and Their Prey Species* contained in Annex 2 of this document;

c) adopt the draft Decisions contained in Annex 3 of this document; and

d) delete Decisions 14.44-14.47.

ANNEX 1

WORK PLAN FOR THE JOINT NOISE WORKING GROUP OF CMS, ACCOBAMS AND ASCOBANS

(version: September 2025)

The members of the JNWG serve in a voluntary capacity. It is understood that the limited time available to members might make it necessary for the JNWG to prioritize tasks, and that not all requests will be fulfilled in each intersessional period.

Regular Tasks

The JNWG will:

1. Review new information on underwater noise, its impacts on species covered by CMS, ACCOBAMS and ASCOBANS and their prey species, mitigation measures, technological developments, best practices and guidelines, and make recommendations to Parties and other relevant authorities for further action.

2. Prepare a report on progress and new information for each meeting of the CMS Scientific Council, ACCOBAMS Scientific Committee and ASCOBANS Advisory Committee, in particular including:

   a) Updated information on:
      - new available information on underwater noise, its effects on marine species (including migratory species and their prey), and the effective assessment and management of this threat
      - relevant activities and developments in other international bodies (both regional and global) and under the EU Marine Strategy Framework Directive
      - relevant developments and new literature, especially with respect to the impacts of noise on cetaceans, other aquatic mammals, and their prey
      - technologies aimed at mitigating the propagation of marine noise and noise sources that may present a threat to marine life
      - Parties' progress in implementing relevant Resolutions of CMS, ACCOBAMS and ASCOBANS, as appropriate

   b) Advice on Best Available Techniques (BAT) and Best Environmental Practice (BEP) to reduce or mitigate marine noise pollution, e.g. by:
      - improving existing guidelines based on new scientific findings
      - detailing available mitigation measures, alternative technologies and standards required for achieving the conservation goals of CMS, ACCOBAMS and ASCOBANS
      - recommending appropriate biological indicators and thresholds

   c) Provision of advice on:
      - collaborating with other international bodies, such as the Barcelona Convention, Black Sea Commission, OSPAR, HELCOM, CBD, IMO, IWC and ICES

- requirements of other relevant bodies that countries have elected to adhere to with respect to underwater noise, such as European Directives (i.e. the Marine Strategy Framework Directive and the Habitats Directive)
- opportunities for influencing decisions of other relevant bodies to achieve more effective protection of marine life from impacts of underwater noise

3. Design and help implement, as appropriate, pilot projects to test and improve existing noise guidelines (ACCOBAMS Res. 7.13 and ASCOBANS AC17/Doc.4-08) and mitigation measures for their application in the field.

4. Respond to additional requests for support from CMS, ACCOBAMS or ASCOBANS, transmitted through their Secretariats, as required.

Specific CMS Mandates

1. Resolution 12.14
   - Upon request, support Parties that have not yet done so in establishing national noise registries to collect and display data on noise-generating activities in the marine area to help assess exposure levels and the likely impacts on the marine environment, ensuring that data standards are made compatible with regional noise registries, such as the ones developed by ICES and ACCOBAMS.
   - Regularly review the *CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities* and provide advice on any need for updates.

2. Decision 14.45
   - Provide a peer review of the updated *Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities.*
   - Prepare a gap analysis of guidance available from CMS and other forums and identify where further guidance is needed on mitigation of the effects of marine noise in order to address the needs of migratory species and their prey.
   - Prepare a report on the state of knowledge of noise impacts and noise mitigation measures for CMS-listed freshwater mammal species and assess the need for specific guidance for freshwater habitats.

3. Decision 14.46 (a) and (d)
   - Implement advice from the Scientific Council as to where to focus efforts to support the implementation of mitigation measures.
   - Where relevant, with competent national authorities, assess the application and effectiveness of existing guidance regarding impact of military sonar and other sound sources generated by military activities on migratory species, and investigate whether further guidelines may be needed to address and mitigate these impacts.

4. Decision 14.47 (d)
   - In collaboration with the Secretariat, continue providing up-to-date information on the CMS website on marine noise to assist Parties and other stakeholders in effective mitigation of impacts of underwater noise on marine species.

Specific ACCOBAMS Mandates

1. Resolution 5.13
   - Develop, in collaboration with Parties and non-Parties, as well as NATO and other stakeholders as necessary, implementable measures to reduce the impacts of intense noise activities within areas identified as 'of special concern' for Cuvier's beaked whales for consideration by the Meeting of the Parties of ACCOBAMS.
   - Organize follow-on workshops on sonar with navies.

2. Resolution 5.15
   - Support the ACCOBAMS Scientific Committee's study on the extent and temporal variability of the habitat of species that are known to be particularly vulnerable to man-made noise (e.g., *Ziphius cavirostris*), to ensure that more data are made available, to increase the model's robustness and to compare different algorithms for best results.

3. Resolution 7.13 and 8.17
   - Review a study on the effects of underwater noise generated by the foreseeable increase of windfarms in the ACCOBAMS Area, addressing all the phases of windfarm development from siting surveys to decommissioning.
   - Examine noise models available in NETCCOBAMS (ACCOBAMS Resolution 8.7 on NETCCOBAMS), considering recent developments from European Union Marine Strategy Framework Directive-D11C2, to compare such noise models with available in situ anthropogenic noise recordings made in different locations throughout the ACCOBAMS Area, taking account of the diverse sensitivities of different cetacean species.
   - Further develop, with the Secretariat and the Scientific Committee, the concept of 'quiet zones', as outlined in Recommendation 10.5 of the Scientific Committee, with a focus on a quantitative elaboration and evaluation of scientific evidence for establishing 'quiet zones' across both space and time.
   - Develop a post-war plan for the Black Sea region to help mitigate the impacts of warfare on cetaceans, their habitat and their prey.

4. Resolution 8.2:
   - Encourage the monitoring of anthropogenic activities generating underwater noise.
   - Encourage the use of mitigation measures for anthropogenic activities generating underwater noise.
   - Exchange relevant information with competent authorities before military activities/exercises.

5. ACCOBAMS SC16 Recommendation 16.9
   - Organize an in-person meeting of the JNWG and request the ACCOBAMS Secretariat to explore, with the Secretariats of CMS and ASCOBANS, how this can best be progressed, recognizing that the meeting will require Terms of Reference, a steering group and funding.
   - Encourage the JNWG to continue its work as proposed in its progress report, including:
     a) further development of the concept of 'quiet zones' as outlined in Recommendation 10.5 of the ACCOBAMS SC

b) updating the noise models available in NETCCOBAMS and securing their compliance with evolving guidance from EU-TG Noise under the European Union Marine Strategy Framework Directive (MSFD-2008/56/EC)

c) comparison of the results of noise modelling with appropriate in situ anthropogenic noise recordings made throughout the ACCOBAMS Area, taking account of the diverse sensitivities of the different cetacean species

d) continued efforts to monitor anthropogenic activities generating underwater noise;

e) further encouragement of the use of mitigation measures for anthropogenic activities generating underwater noise

f) further efforts to develop and assess the effectiveness of new mitigation measures

g) improved facilitation of the exchange of relevant information with competent authorities related to military activities and exercises, from planning to assessment of impacts

Specific ASCOBANS Mandates

1. Resolution 8.3
   - Contribute to improving knowledge on impact of impulsive and continuous anthropogenic underwater noise on harbour porpoises, and the development of threshold limits of significant disturbance and indicators of good environmental status (GES) (Jastarnia Plan, Action RES-07).
   - Contribute to evaluation of implementing regionally harmonized national threshold limits and guidelines for regulation of underwater noise (Jastarnia Plan, Action MIT-05).

2. Resolution 8.11 (Rev.MOP9):
   - In collaboration with the CMS Scientific Council, assess the need for updating the guidelines and/or its Technical Support Information regularly, as appropriate.
   - Support the Advisory Committee to continue monitoring new available information on the effects of underwater noise on cetaceans and their prey species, as well as the effective assessment and management of this threat, and to make recommendations to Parties as appropriate.
   - Support the Advisory Committee to engage and collaborate with other relevant bodies considering anthropogenic noise, including the IWC, ICES, HELCOM and OSPAR.

3. Resolution 10.2/Rev.1
   - Review new information on underwater noise, its impacts on small cetaceans and their prey species, mitigation measures, monitoring, technological developments, best practices and guidelines. Make recommendations to Parties and other relevant authorities for further action.
   - Review new information on high order and low order UXO detonation in the marine environment, the associated chemical release and the effect on small cetaceans and their prey. Make recommendations to Parties and other relevant authorities, e.g. when proposing noise mitigation measures.
   - Assess whether national navies' mitigation protocols for use of military sonar are effective. This requires Parties to request the mitigation protocols from the navies.

- Review new information on unexploded ordnance and underwater munitions and their impacts on small cetaceans and cetacean habitat. Make recommendations to Parties and other relevant authorities and fora, such as OSPAR and HELCOM for further action.

4. ASCOBANS AC26:
   - Advise on how to improve monitoring and mitigation of underwater noise and to reduce the cumulative impact on small cetaceans (AC26/AP2).
   - Provide guidance on monitoring and mitigating the impact of continuous and impulsive noise, noting recommendations included in ASCOBANS/AC23/Inf.5.1.1a (AC26/AP2).
   - Develop guidelines for mitigation of explosions and environmentally sound removal of UXO from the sea (AC26/AP10).

ANNEX 2

ANTHROPOGENIC UNDERWATER NOISE IMPACTS AND MITIGATION STRATEGIES FOR CMS-LISTED FRESHWATER MAMMALS (CETACEANS, SIRENIANS, OTTERS) AND THEIR PREY SPECIES

(The full report can be found in UNEP/CMS/COP15/Inf.25.2.2)

Summary

There has been a marked increase in anthropogenic underwater noise levels since the mid-1900s. Given the fundamental role of sound in aquatic ecosystems and the demonstrated and potential adverse effects of anthropogenic noise, underwater noise pollution is increasingly being recognized as a critical global conservation challenge. While marine noise pollution has garnered significant scientific concern, anthropogenic noise pollution in freshwater ecosystems has received comparatively little attention.

The report contained in UNEP/CMS/COP15/Inf.25.2.2 was developed in response to COP14 Decisions 14.45 (c). It covers all freshwater mammal species (cetaceans, sirenians, otters) currently listed on CMS Appendices, as well as their prey. Through compilation and analysis of available data for all CMS-listed freshwater mammals (cetaceans, sirenians and otters), this report provides a summary of the state of knowledge on noise impacts and noise mitigation measures for CMS-listed freshwater mammals, covering their prey species and freshwater habitats, such as estuaries, rivers and lakes. It addresses:

1) The state of knowledge of noise impacts on CMS-listed freshwater mammal species and their prey
2) The state of knowledge of noise mitigation measures that take into account the specific requirements and properties in habitats such as estuaries, rivers and lakes
3) An assessment of whether existing guidance on noise mitigation sufficiently covers the needs of CMS-listed freshwater mammal species and their prey
4) A recommendation as to whether specific noise mitigation guidance for freshwater habitats is required

Key findings

Current noise mitigation measures focus on spatial and temporal management approaches, as well as Best Available Technology (BAT) and Best Environmental Practice (BEP) for mitigating specific noise sources, such as shipping and pile driving. Existing guidelines on environmental impact assessments and mitigation for noise-generating activities have been developed – e.g., by CMS, the EU and US – although the majority of these guidelines were developed for marine species and habitats. Key gaps remain for CMS-listed freshwater mammals, including:

1) No recognition as priority species in regulation
2) Insufficient baseline data on habitat noise levels
3) A lack of data on effects of noise on hearing and on disruption of behaviour for most freshwater mammals

Freshwater ecosystems are spatially restricted, which means that (i) the ability of freshwater mammals to escape threats (including high underwater sound levels) is limited and (ii) these

animals experience more significant impacts due to the greater reverberation and persistence of noise in their environment. Therefore, the need to address the threat of acoustic pollution may be equally – if not more – urgent in freshwater ecosystems than it is in the marine environment.

This report concludes that noise mitigation guidelines must be developed for mammals, fish and other species in freshwater environments, as current regulatory frameworks and guidelines fail to adequately protect CMS-listed freshwater mammals and their prey. The report makes recommendations on which measures to include in specific guidance for freshwater habitats, such as restrictions on noise-generating activities, vessel-quieting technologies, slow-down areas and maintaining ecological flow regimes. The development of noise mitigation guidance specific to CMS-listed freshwater mammals and their habitat would be expected to lead to improved conservation outcomes for these threatened species.

Recommendations

To improve the conservation status of CMS-listed freshwater mammal species, precautionary conservation strategies and targeted mitigation measures are needed to protect both the listed species and their prey. Any guidance that may be developed could benefit from looking at any or all of the following measures:

- Implementing restrictions on noise-generating activities

Designating specific areas and/or time periods where noise-generating activities such as vessel traffic and construction are restricted or prohibited can protect freshwater mammals from disturbance, stress and auditory injury. Examples include fishing bans/restrictions and speed reduction zones in otter, manatee and cetacean habitats.

- Applying vessel-quieting technologies and vessel-type restrictions

Improving vessel design, such as optimizing propellers and hulls, and adopting quieter technologies such as through implementation of the revised IMO guidelines can significantly reduce underwater noise. Including noise criteria in the design of new vessels and retrofitting older vessels with quieting technologies can help minimize cavitation and mechanical noise. These practices are particularly beneficial in high-traffic freshwater systems.

- Reducing vessel traffic intensity

Reducing the number and speed of vessels in aquatic mammal habitats lowers ambient noise levels and reduces disturbance. Studies show that slower speeds reduce noise levels for vessels with fixed pitch propellers. Setting traffic limits, lowering navigation speeds and ensuring vessels are fully loaded, thereby reducing the number of vessels required, can balance ecological protection with transport efficiency.

- Implementing reductions in sonar use

Sonar use can severely disrupt echolocation. Limiting or prohibiting it in key habitats helps reduce metabolic stress and behavioural disturbance.

- Reducing vessel traffic at times when animals are most vulnerable

Vessel activity at times when animals are most vulnerable – e.g., when they are spending more time near the surface as part of their diurnal pattern – may increase collision risks for some freshwater mammals. Both indirect and direct evidence of vessel avoiding behaviour has been documented. Limiting or prohibiting traffic at those times in key habitats, and/or

lowering vessel speed, helps reduce metabolic stress and behavioural disturbance. This is particularly important during dry seasons when river depth is low.

- Implementing reductions in sonar use

Sonar use can severely disrupt echolocation, therefore, limiting or prohibiting it in key habitats helps reduce metabolic stress and behavioural disturbance.

- Establishing slow-down zones

Creating zones where vessels must reduce speed can decrease collision risks and noise levels. Incentives like reduced port fees or penalties for non-compliance can improve adherence. Such zones have proven effective in marine contexts and are recommended to be applied to freshwater habitats.

- Maintaining ecological flow regimes

Climate change and anthropogenic activities – particularly dam construction – have altered flow regimes in many freshwater systems, exacerbating drought conditions. Ensuring natural water flow patterns helps keep freshwater mammals in quieter, safer areas and supports healthy habitat conditions. This prevents displacement into noisy main channels and maintains depth profiles that reduce noise reverberation, which can be vital during seasonal low-water periods.

- Maintaining the non-navigable status of ecologically important river branches

Preserving undisturbed tributaries as non-navigable zones provides acoustic refuges for freshwater mammals. These areas typically have lower noise levels and higher biosonar activity, supporting essential behaviours like foraging and communication.

- Increasing the utilisation of shore-to-ship power

Using shore-based electrical power while docked allows ships to shut down engines, reducing in-port noise and emissions. This practice is increasingly adopted to mitigate pollution in riparian environments and is also a practical solution for reducing noise in and near freshwater habitats.

- Advancing multimodal transport through ecologically meaningful organization of transportation

Integrating rail and road transport with waterway systems can reduce reliance on noise-generating river traffic. Technologies such as AI-driven route coordination and optimized speed control help minimize abrupt manoeuvres and cavitation noise. Shifting heavy cargo transport from rivers to land routes benefits species whose habitat overlaps with busy waterways, such as the Irrawaddy dolphin but any modal shift would need to be carefully evaluated for other environmental implications.

- Increasing law enforcement patrols in freshwater ecosystems

Enhanced patrols and licencing programmes improve compliance with speed and noise regulations. Enforcement helps reduce vessel strikes of animals and noise pollution in sensitive areas. Where noise regulations already exist, such as in Florida, compliance is shown to be variable, highlighting the need for consistent monitoring and enforcement.

- Eliminating noise pollution from fishing vessels

Fishing bans and/or restrictions in critical habitats protect both prey species and freshwater mammals from entanglement and noise. These protection measures also reduce ecological degradation caused by vessel traffic. Examples of existing bans include moratoriums on commercial fishing in the Amazon and Yangtze River basins. Examples of seasonal fishing closures exist for Florida manatees at several winter aggregation sites.

- Assessing the effects of noise on hearing and behaviour of freshwater species and determining species-specific safe noise exposure levels

Studies on the effects of noise on hearing and on behavioural disruption are essential for setting safe noise thresholds tailored to each species. Currently, only a few freshwater mammals have audiograms, limiting effective noise regulation. Targeted research is needed to fill these gaps and guide mitigation strategies.

- Reducing overlap between cetaceans and noise by using real-time cetacean alert systems

Alert systems that detect and notify vessels of nearby cetaceans may be able to prevent vessel strikes and reduce noise exposure. While developed for marine environments, adapting these technologies for freshwater habitats has potential for species conservation and animal welfare. Real-time alerts enable proactive adjustments of vessel operation.

- Enforcing responsible tourism guidelines

Unregulated freshwater mammal watching can cause chronic stress and behavioural disruption. Implementing and enforcing tourism guidelines helps minimize noise and human interference. The CMS *International Guidelines for Sustainable Marine Wildlife Interactions: Boat-Based and In-Water Activities* offer a model that could be adapted for freshwater species.

- Reducing the effects of particle motion on fish and invertebrate species

Many fish and invertebrates are sensitive to particle motion rather than sound pressure, which is often not considered in noise mitigation measures. These species play vital ecological roles and are often prey of CMS-listed freshwater mammals, yet lack tailored regulatory protections. More research is needed to understand how particle motion affects these species and to develop effective mitigation strategies that address this specific acoustic impact.

- Avoiding or minimizing underwater noise from construction, pile driving, seismic surveys and other anthropogenic activities

In addition to shipping, activities such as construction, military exercises and seismic surveys contribute significantly to underwater noise pollution. Pile-driving and seismic airgun surveys, already carried out in some riverine and estuarine systems, generate loud impulsive sounds that can disrupt communication, navigation and foraging in freshwater mammals, or even cause physical harm. While most evidence comes from marine studies, similar risks are expected in freshwater habitats – in fact, given the confined nature of freshwater bodies, they may be even more severe. To address these threats, CMS guidelines and technical reports recommend avoiding or strictly managing noise-generating activities and applying best available technology and practices to reduce their impacts.

ANNEX 3

DRAFT DECISIONS

UNDERWATER NOISE

Directed to Parties

15.AA Parties are requested to assess whether CMS-listed freshwater mammals within their jurisdiction are negatively affected by underwater noise, and in view of the concerning conservation status of many of these species, urgently apply mitigation measures such as spatiotemporal restrictions on noise-generating activities, ship-quieting technologies, slow-down regions and maintaining ecological flow regimes while awaiting the development of specific guidance for freshwater habitats.

Directed to the Scientific Council

15.BB The Scientific Council, subject to the availability of resources and where applicable through the Joint Noise Working Group of CMS, ACCOBAMS and ASCOBANS, is requested to:

a) develop guidance on mitigation of noise affecting CMS-listed freshwater mammals and their prey;

b) assess the application and effectiveness of existing guidance regarding impact of military sonar and other sound sources generated by military activities on migratory species, where relevant in collaboration with competent national authorities, and assess whether further guidelines may be needed to address and mitigate these impacts;

c) conduct a comprehensive review of sources of underwater noise of concern, including an assessment of existing guidance and knowledge available from CMS and other relevant forums, to identify gaps in current guidance related to the mitigation of underwater noise impacts on migratory species and their prey, and provide recommendations to Parties, including suggestions for effective mitigation measures;

d) review the National Anthropogenic Underwater Noise Guidelines developed by the Government of Australia once they become available and evaluate whether an update of the Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities is still required to provide additional guidance to Parties; and

e) if needed, provide a peer review of the updated Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities.

Directed to the Secretariat

15.CC The Secretariat shall, subject to the availability of resources:

a) facilitate an update of the Technical Support Information to the CMS Family Guidelines on Environmental Impact Assessment for Marine Noise-generating Activities and publish it as a Technical Series, if needed in view of the National Anthropogenic Underwater Noise Guidelines developed by the Government of Australia;

b) convene an in-person workshop to assist the Joint Noise Working Group with advancing priority activities of the Work Plan and as outlined in Decision 15.BB;

c) in collaboration with the Joint Noise Working Group, continue providing up-to-date information on the CMS website on marine noise to assist Parties and other stakeholders in effective mitigation of impacts of underwater noise on marine species; and

d) support the Scientific Council and the Joint Noise Working Group in developing the requested reports and any further guidance on mitigation of the effects of marine noise, as required.