Document title	Draft Action Plan on Underwater Noise
Code	5-9
Category	DEC
Agenda Item	5 - Matters arising from the HELCOM Groups
Submission date	19.05.2020
Submitted by	Executive Secretary
Reference	Outcome of HOD 57-2019, para. 3.30, 4.29-4.32; Outcome of PRESSURE 12-2020, para. 8.1-8.5

Background

The EN-Noise has been working on the improvement of the draft Action Plan on Underwater Noise since its first consideration by the Pressure Working Group back in 2019. Efforts have been made to involve relevant working groups in the process, and thus previous versions of the document presented to this Meeting were introduced at PRESSURE 10-2019, MARITIME 19-2019 and STATE & CONSERVATION 11-2019. The EN-Noise addressed the input provided at these meetings, and a further-developed document was considered first at PRESSURE 11-2019, and subsequently at HOD 57-2019, where it was in general supported, and guidance on its further development, also in relation to the BSAP update process, was provided (Outcome of HOD 57-2019, para. 3.30, 4.29-4.32).

The EN-Noise further developed the draft Action Plan based on the input provided by HOD 57-2019 and submitted to PRESSURE 12-2020 which agreed that the draft had been significantly improved. The meeting took note of the clarification by the Chair of EN-Noise that introduction of regulatory limits and mitigation measures is hampered by lack of agreed scientifically sound threshold values for underwater noise, but the knowledge base is rapidly developing, and the values are foreseen to be established soon. The meeting noted that effectiveness of measures is currently difficult to evaluate but this is to be considered in future work as well as that NGOs urge to consider concrete measures to mitigate underwater noise.

The meeting pointed out that it still requires some improvements before submission to HOD 58-2020 for final endorsement and agreed that proposals for amendments would be provided by 4 May 2020 and that the document would be finalized for submission to HOD 58-2020 by EN-Noise.

Already in PRESSURE 12-2020, Poland proposed to include, under point 2.4 “Regional actions involving third parties”, an action related to communication with NATO and development of international guidelines for the removal and detonation of ammunition, for which a detailed text proposal was provided at a later stage. Additional input was provided by Denmark, Finland, Germany and CCB.

The Chair of EN-Noise addressed the input received and shared an improved draft with the EN-Noise for an additional commenting round on 7 May 2020. No additional comments were received.

Thus, this document contains the revised draft Action Plan on Underwater Noise. For an easier follow up an explanation of how the comments provided have been addressed is included as Annex 1.

Action requested

The Meeting is invited to consider and endorse the draft Action Plan on Underwater Noise.

Draft HELCOM Regional Action Plan (RAP) on Underwater Noise

Preamble

In 2013 it was agreed in the HELCOM Copenhagen Ministerial Declaration that

- the level of ambient noise and distribution of impulsive sounds in the Baltic Sea should not have negative impact on marine life, and that
- human activities that are assessed to result in negative impacts on marine life should be carried out only if relevant mitigation measures are in place.

By this is meant that HELCOM should commit to monitor and manage man-made (anthropogenic) underwater noise in the Baltic and actively assure that levels do not exceed targets established to secure that man-made noise does not prevent recovery of the Baltic Sea ecosystems.

This commitment resulted in the development and implementation of the Regional Baltic Underwater Noise Roadmap 2015-2017, which includes the establishment of a joint HELCOM/OSPAR registry of licenced impulsive sound events and development of a regional monitoring programme for continuous noise.

Furthermore, in the HELCOM Brussels Ministerial Declaration in 2018 it was agreed to

- develop an action plan, preferably by 2021, and regionally coordinated actions on underwater noise, aiming, in the long-term, at addressing adverse effects of underwater noise on marine species identified as sensitive to noise, whilst safeguarding the potential of the Baltic Sea for sustainable human activities
- continuing fruitful cooperation between European Regional Seas Conventions, and in particular OSPAR, in order to exchange good practices and to fill knowledge gaps, and to continuing regional work in developing scientifically sound threshold values for underwater noise that are consistent with GES for species identified as sensitive to noise in the Baltic Sea, in close coordination with work undertaken by Contracting Parties in other relevant fora including UNEP Regional Seas Programme.

The present document lists current activities and proposed new ones directed at achieving these goals. These activities take their natural outset in the current work on developing and maturing indicators to be used in assessment of GES with respect to underwater noise and establishment of associated thresholds and management targets.

Types of actions

HELCOM Contracting Parties agreed to start implementation of actions to reduce the negative impacts of underwater noise to be further developed jointly, assisted by the relevant HELCOM subsidiary bodies including lead countries. The actions on reduction of pressures of underwater noise are an inherent part of the RAP on Underwater Noise, having the scope to define and achieve good environmental status by member states towards 20XX[1].

The actions are divided into regional actions and national actions.

The regional actions are to be jointly implemented on a regional scale by the Contracting Parties to the Helsinki Convention. The national actions are actions to be implemented nationally on a voluntary basis.

Both type of actions (regional and national) are focused on reduction of pressures and impacts from underwater noise sources of different types. Actions are thus further subdivided into four subcategories, three addressing different source types and a fourth addressing measures involving third parties.

[1] To be in agreement with the BSAP update.

The effectiveness of the suggested actions has not been formally evaluated. However, it is related to the underwater noise indicators, which are not yet fully developed. Once the indicators are further developed (listed as actions below), it will become possible to describe how the remaining actions link to the indicators and thereby assess the effectiveness of the actions.

Actions addressing reduction of pressures and impacts from impulsive noise sources

These actions relate to impulsive[2] noise sources, such as those covered by the Joint HELCOM/OSPAR impulsive noise register, hosted by ICES. The relevant impacts from these sounds are primarily disturbance of behaviour, leading to an effective habitat loss (temporary or permanent) and possible direct injury and/or damage to the auditory system of animals. The relevant sources include pile driving, air gun surveys, underwater explosions, sonars, acoustic deterrence devices and other impulsive sources with significant energy below 10 kHz and are currently addressed by the pre-core indicator "Distribution in time and space of loud low- and mid-frequency impulsive sounds". Suggested actions for this group of sound sources relate to improving the coverage and quality of the data supplied to the ICES impulsive noise register and to development of impact indicators, which will allow inclusion of information about relevant and sensitive ecosystem components (i.e. noise sensitive animals). Indicators can act as triggers for implementation of actions/measures necessary to improve the state when Good Environmental Status is not reached with respect to the pressure. In such a case, technical and operational mitigation measures need to be implemented in the Baltic Sea. Several mitigation measures are already implemented nationally and have served as efficient incentives to the development of mitigation techniques and alternative technologies. These examples are to be evaluated as candidates for Best Environmental Practice and implemented at regional level, where appropriate.

Actions addressing reduction of pressures and impacts from continuous noise

These actions relate to sources emitting continuous low frequency sound, which means sources, whose main impact on the environment relates to the increase of noise levels above natural ambient. Primary impact is believed to be through a temporary or permanent reduction in communication distances for animals, as well as other masking effects, such as reduced ability to detect prey, predators and obstacles (e.g. gill nets) acoustically. The primary sources are engine and propeller noise from ships and boats but may also be noise from towed bottom-touching fishing gear and offshore installations of various kinds. These sources are currently addressed by the pre-core indicator "Continuous low-frequency anthropogenic sound". Suggested actions for this group of sound sources relate to maturing the pressure indicators and develop impact indicators, which, as above, will allow inclusion of information about relevant and sensitive ecosystem components (i.e. noise sensitive animals). In order to mitigate the impact of these sources that produce a diffuse noise field, operational measures, such as re-routing and speed regulations, can be implemented aiming at short-term improvement. Longer-term measures comprise of technical mitigation measures such as implementing ship-quieting techniques in new ships, or retrofitting old ships with this techniques. Some of the relevant actions can be implemented through national legislation, other need agreement in relevant international bodies, most importantly the International Maritime Organisation (see also para "Actions with third parties").

Actions addressing reduction of pressures and impact from other noise sources

These actions relate to pressures from sources not covered under the above categories, but with reason for concern regarding negative impact on the marine ecosystem. This includes sources such as echosounders, sonars and other surveying equipment, acoustic deterrence devices and other continuous or impulsive sources with primary energy above 10 kHz. Some of these sources are sufficiently loud to have effects at long range (such as seal scarers and sonars), whereas others raise concern primarily because of their ubiquitous

[2] There is no clear definition of impulsive sounds, but the sources included under this category all emit short pulses (not more than a few seconds in duration) and typically with a sharp onset. In addition, they are loud enough to potentially affect sensitive animals at distances of hundreds of meters to several kilometers. For further, see Dekeling et. al. (2014).

abundance (such as echosounders). Relevant effects of these sources include both behavioural disturbance and masking of communication/passive hearing. Suggested actions for this group of sources relate to increasing the knowledge about abundance and impact of sources and, if relevant, develop specific indicators that can quantify the pressure from this group of sources and capture the impact on ecosystem components. Guidelines and regulation of the design and use of such noise sources are important actions to reduce their impact.

Actions with third parties

These actions require involvement of third parties, which include national and international stakeholders (such as IMO, fisheries organisations, NGO's, OSPAR and the EU Technical Group on Underwater Noise). An important aim for these actions relates to coordination of work with indicators, thresholds and targets across regional seas conventions and with ongoing work at EU level. A similarly important aim relates to developing useful frameworks for regulating cross-border activities, in particular ship traffic, through close cooperation with relevant organisations, in particular IMO.

Regional actions – HELCOM Collective Actions

The following tables contain preliminary lists of actions for the Contracting Parties to the Helsinki Convention for joint implementation on the regional scale. The lists are to be further elaborated and amended. Actions are grouped, but not prioritized.

2.1 Regional actions addressing impulsive noise sources

CODE	REGIONAL ACTION	FURTHER SPECIFICATION
Monitoring of pressure and collection of ecological data		
1	Improve the quality of data submitted to the HELCOM impulsive noise register by updating and improving the common HELCOM guidelines for monitoring impulsive noise events in the Baltic Sea.	Based on the reporting to the register already available. Main aim of action is to increase the completeness, spatio-temporal resolution and quality of submissions to the register.
2	Improve assessment of impact of impulsive noise by identifying important habitats and biologically sensitive areas and periods in the Baltic Sea region, where the introduction of high-energy impulsive noise is likely to have negative impact.	Based on HELCOM identified noise sensitive marine animal species (HELCOM 2019), which are to be delineated based on biological data and science-based criteria and in cooperation with other HELCOM working and expert groups (such as EG-MAMA)
Measures to improve assessment of impact from impulsive noise		
3	Establish common methodology for the assessment of negative impact from impulsive noise	Development and description of best practice for assessing potential injury and behavioural disturbance (habitat loss) in relation to for example environmental impact assessments (EIAs) and strategic impact assessments (SIAs).
4	Further develop the HELCOM impulsive noise pre-core indicator towards an operational core indicator	This includes development of methods to assess environmental status based on the indicator as well as definition of thresholds and targets.
5	Develop and implement one or more HELCOM impact indicators for impulsive noise	Based on the current pressure indicator, but with inclusion of information about distribution of sensitive species and habitats. This work is a continuation of

		the work described in the noise sensitivity report (HELCOM 2019) and should preferably be along the same lines as the impact indicator currently under development in OSPAR and in accordance with the recommendations by TG-NOISE.
Measures to reduce impact of impulsive noise		
6	Identify Best Available Practice and Technologies in mitigation of impact from impulsive noise by assessing the effectivity of existing and potential mitigation measures, to form basis for HELCOM best practice guidelines.	Including noise abatement systems, alternative methods and spatio-temporal exclusion of UXO clearing, commercial sonars and test/training/exercise of military sonars, alternative seismic sources, and sub-bottom profilers
7	Increase the use of Best Available Practice and Technologies in mitigation of impact from impulsive noise by establishing common HELCOM best practice guidelines in methods for mitigation of impact from impulsive noise	Implementation of the knowledge gained from action 6.
8	Improve regional and cross-border coordination of the spatio-temporal planning and permitting by establishing a common reporting system for planned activities likely to produce impulsive noise.	This constitutes an extension of the impulsive noise register to include future activities that are currently only recorded after they occurred.
9	Improve protection of areas, which have already been defined as important or critical habitat for noise sensitive species, by obligating the adoption of adequate operational and technical noise mitigation measures.	HELCOM (2019) already identified a number of important areas which are important for noise sensitive species (such as the core habitat of the critically endangered harbour porpoise population of the Baltic proper or spawning areas of fishes using sound for communication). If the area is already protected as an MPA, this can be included as part of the management. This does not imply that measures (such as those identified in action 6) are not required in other areas not specifically protected.
10	Reduce injury and behavioural disturbance from impulsive noise by establishing common HELCOM criteria for injury and disturbance, as well as common exposure limits.	These criteria and exposure limits are not identical to the GES-thresholds to be established under point 4, but are operational criteria that can be applied to individual activities generating impulsive noise.

2.2 Regional actions addressing continuous low frequency sound

CODE	REGIONAL ACTION	FURTHER SPECIFICATION
Monitoring of pressure and collection of ecological data		
11	Improving accessibility and sharing of monitoring data by operationalisation of the common database for monitoring data on continuous underwater noise	As decided by HOD 55-2019 and currently under implementation through hosting of database by ICES.
12	Development of common guidelines for reporting of continuous noise levels in the Baltic Sea.	Linked to and in progress in connection to establishment of common database hosted by ICES.
13	Increase regional coordination and management of impulsive noise sources by establishing a common framework for modelling past, present and future noise levels in the Baltic.	Continuation of the Soundscape planning tool developed under the BIAS project, as decided by HOD 55-2019. Such modelling is based on AIS and other relevant information about sources, such as source levels and frequency spectra. Includes developing methods to include noise from leisure boats without AIS transmitters as well as natural ambient noise.
14	Improve assessment of impact of continuous noise by identifying important habitats and biologically sensitive areas and periods in the Baltic Sea region, vulnerable to elevated levels of continuous noise.	Some information available in (HELCOM 2019). To be amended based on biological data and science-based criteria and in cooperation with other HELCOM working and expert groups (such as EG-MAMA).
Measures to improve assessment of impact from continuous noise		
15	Establishment of a common methodology for assessment of impact of activities generating continuous noise.	Applies to for example shipping, offshore installations, construction works (other than pile driving and similar impulsive sources) and offshore infrastructure, etc.
16	Further develop the HELCOM continuous low-frequency sound pre-core indicator towards an operational core indicator.	This includes development of methods to assess environmental status based on the indicator (action 15) as well as definition of thresholds and targets.
17	Increase the knowledge on impact of noise by supporting research on effects of continuous noise on marine biota.	As detailed in the HELCOM science agenda
18	Develop and implement one or more HELCOM impact indicators for continuous low-frequency sound.	Based on the current pressure indicator (action 16), but with inclusion of information about distribution of sensitive species and habitats (action 14).
19	Expand and improve the existing and potential operational and technical measures to reduce impact of continuous noise to form a basis for common guidelines on management.	Collection of experience from HELCOM members and abroad and collection of new information through research and development, as detailed in the HELCOM science agenda

Measures to reduce impact from continuous noise		
20	Reduction of elevated continuous noise levels in noise sensitive and biologically important areas in the Baltic Sea by adoption of guidelines on management, based on the HELCOM input to the establishment of environmental targets for underwater noise.	Implementation of knowledge gained under action 19. Guidelines may encompass rerouting and speed limiting of heavy shipping traffic passing biologically important areas in the Baltic Sea. Guidelines should be harmonized with the IMO Energy Efficiency Design Index (EEDI principles) describing optimal management of vessels speeds, noting that optimum speed and engine load may differ with respect to energy efficiency and noise reduction requirements.
21	Inciting voluntary actions by ship and boat operators by raising awareness of and cooperation with shipping companies and boat owners on speed management for their vessels including different aspects of adjusting and planning for vessel speed and engine load optimised for the reduction of underwater sound.	This can include installing monitoring systems at strategic locations (for example at outer approaches to ports) with real-time feedback to the ship's crew, to raise awareness and to aid in optimizing vessel and engine operations for reduced underwater noise radiation.
22	Enhance Baltic Sea wide cooperation of port authorities to introduce novel initiatives, such as harbour fee systems, in order to set incentives for quiet vessels.	See Port of Vancouver (2017), ECHO Program
23	In coordination with IMO, work towards establishing a standard for ship classification based on noise emissions and apply such classification to navigation in the HELCOM area.	This would be particularly relevant for ships navigating through areas identified as important to noise sensitive species.

2.3 Regional actions addressing other noise sources

CODE	REGIONAL ACTION	FURTHER SPECIFICATION
Monitoring and collection of ecological data		
24	Identification of other noise sources with significant impact on the marine ecosystems but not covered by the measures targeting impulsive and continuous noise	This includes, but is not limited to, sources with main energy above 10 kHz: echosounders, military and non-military sonars, sub-bottom profilers, net pingers, and hydroacoustic instruments.
25	Identification of important habitats and biologically sensitive areas and periods in the Baltic Sea region, vulnerable to elevated levels of noise from other sources than those covered by existing pressure indicators.	Based on biological data and science-based criteria and in cooperation with other HELCOM working and expert groups (such as EG-MAMA)
Measures to improve assessment of impact from other noise sources		
26	Compile and assess available information about potential impact caused by noise from leisure boats	As detailed in the HELCOM science agenda

27	Development of HELCOM indicators suitable for monitoring noise sources identified under measure 18.	Existing indicators cover impulsive noise under 10 kHz and continuous low-frequency noise, but does not include echosounders, most sonars and sub-bottom profilers, net pingers, etc.
28	Development of common guidelines for assessing impact from echosounders, sonars and other sources not covered by 2.1 and 2.2	Such as to apply to environmental impact assessments (EIAs) and assessment of environmental status (GES).
29	Support for research on pressure and impact from echosounders and other low-level, but abundant sound sources.	As detailed in the HELCOM science agenda
Measures to reduce impact from other noise sources		
30	Reduce the impact from acoustic deterrent devices by developing and agreeing on common guidelines and regulation of the design and use of deterrent devices	Action proposed for BSAP update

2.4 Regional actions involving third parties

CODE	REGIONAL ACTION	FURTHER SPECIFICATION
31	Reduce ship noise emissions by establishing a discussion between HELCOM and IMO about binding requirements and voluntary actions for use of noise reducing technologies and operating practices for ships in the Baltic	Includes, but not limited to, discussions on vessel quieting technologies, speed and routing regulation. Initiate discussions on feasibility of reducing or otherwise regulate the emissions from echosounders (in general or restricted to sensitive areas) without compromising navigational safety. Discuss feasibility of systems providing real-time feedback to bridge about noise emissions from the ship.
32	Establish platforms to share best practices on policy options within member states and between authorities, the private sector and NGO's. Improve public awareness, so that political decision makers, local administrations and civil society are adequately informed about the underwater noise challenges.	For example, issuing a bulletin on best practices and policy options in the region and in the world.
33	Strengthen the cooperation with OSPAR on development of common and/or compatible indicators, databases and assessment methodologies	As agreed on an overall level in the 2018 HELCOM Brussels declaration
34	Maintain and strengthen cooperation with the European Union expert group TG-Noise on issues of mutual interest	In particular to assure consistency in development of indicators and criteria and methods for establishing thresholds and targets

35	Reduce the impact from leisure boats by establishing a discussion with producers of echosounders and fishfinders with the goal of introducing standards for sound emission from echosounders, fishfinders and engines of leisure boats.	This aims for example at installing on/relates to the ability to turn off and adjust source level and frequency of echosounders and fish-finders, as well as developing industry standards for underwater noise emissions for boat engines.
36	Reduce the impact from underwater explosions in connection to munition clearance, by establishing a discussion between HELCOM and NATO to develop international guidelines for the safe removal and detonation of ammunition through binding requirements and voluntary actions for use of noise mitigation technologies and operating practices in the Baltic	Initiate discussions on the use of noise mitigation measures, as well as informing nature protection institutions about planned detonations and mitigation methods. Including, but not limited to, discussions on deterrent measures, abatement technologies, spatio-temporal planning of clearance operations in relation to ecosystem sensitivity. Initiate discussions on feasibility of reducing the impact on biota without compromising navigational safety.

Voluntary national actions

The following tables provide preliminary lists of proposed actions for the Contracting Parties to the Helsinki Convention for voluntary implementation. These actions aim at information exchange and coordination but are primarily of national concern and in the responsibility of the Contracting Parties.

3.1 Voluntary national actions addressing impulsive noise sources

CODE	PROPOSED NATIONAL ACTIONS
1	Propose national legislation to reduce impact of impulsive noise from activities such as: • Pile driving • Underwater explosions • Sonars and surveying equipment
2	Increase awareness, knowledge transfer and coordination through the creation of a national forum for stakeholders on issues related to underwater noise
3	Increase regional cooperation and coordination by sharing national experiences on the implementation of national legislation to reduce impact of impulsive noise
4	Conduct research into new solutions to reduce impulsive noise, including alternatives to pile driving, seismic sources, sonars and, explosions
5	Conduct research on impact of impulsive noise on marine life and provide qualitative and quantitative information to assist in prioritizing and optimizing measures
6	Reduce impact of underwater explosions by development and implementation of national regulation on permitting of underwater explosions and implementation of mitigation measures

3.2 Voluntary national actions addressing continuous noise sources

CODE	PROPOSED NATIONAL ACTIONS
7	Improve monitoring of boat noise by establishing national regulation for mandatory use of AIS transmitters on leisure boats likely to emit high levels of underwater noise. Could be as a requirement based on engine power or equivalent
8	Propose national legislation regulating the use of leisure boats with the objective of reducing impact from underwater noise on noise sensitive and biologically important areas and species This would include certification of engines and operational measures such as speed limits to engine driven leisure boats in MPAs designated for sound sensitive species as identified in HELCOM 2019 and actions 11 and 19.
9	Participation in and active contribution to common platforms for sharing best practices on policy options within HELCOM countries (gaps in national legislation etc.)
10	Increase the accuracy of soundscape modelling tools by establishing national databases of source information about ships, to serve as input for spatiotemporal modelling of continuous noise. Enable use of such national data for HELCOM noise mapping.
11	Enable voluntary actions to reduce underwater noise by improving awareness among ship owners and the public of the actual noise level radiated by ships, for example by means of real time in-situ measurements close to ports.
12	Introduce mandatory requirements for impact assessment prior to permitting noisy activities not regulated by other legislation, such as power boat races.

3.3 Voluntary national actions addressing other noise sources

CODE	PROPOSED NATIONAL ACTIONS
13	Reduce impact from acoustic deterrent devices (including seal scarers) by developing and implementing national regulations on their use.
14	Development and implementation of national regulations for the use of echosounders and fishfinders on leisure boats, in particular in sensitive areas
15	Development and implementation of national regulation and permitting procedures for use of sub-bottom profiling and similar instruments
16	Discussion of possible regulation of use of military sonars during testing, training and exercises

3.4 Voluntary national actions involving third parties

CODE	PROPOSED NATIONAL ACTIONS
17	Establish national stakeholder fora for issues involving underwater noise

Reporting on effectiveness of actions by member states & analysis of the feedback

Report on the implementation of actions for the first time by 20XX through HELCOM Pressure Working Group and thereafter on a regularly basis.

References

Dekeling, R. P. A., M. L. Tasker, A. J. Van der Graaf, M. A. Ainslie, M. H. Andersson, M. André, J. F. Borsani, K. Brensing, M. Castellote, D. Cronin, J. Dalen, T. Folegot, R. Leaper, J. Pajala, P. Redman, S. P. Robinson, P. Sigray, G. Sutton, F. Thomsen, S. Werner, D. Wittekind, and J. V. Young. 2014. Monitoring Guidance for

Underwater Noise in European Seas, Part II: Monitoring Guidance Specifications. European Commission, Luxembourg.

HELCOM 2019. Noise sensitivity of animals in the Baltic Sea. Baltic Sea Environment Proceedings N° 167.

Port of Vancouver (2017): ECHO Program Slowdown Trial – Preliminary Findings. Voluntary Vessel Slowdown Trial in Haro Strait. Vancouver Fraser Port Authority, 9. Nov. 2017. 6 S.

Annex 1 Compilation of the comments provided on the draft Action Plan and a summary of their handling

<table>
<tr><th>Comment</th><th>Response</th></tr>
<tr><td>Sweden (on PRESSURE meeting)</td><td></td></tr>
<tr><td>Asked for strengthening the tone of the text, to make it more proactive.</td><td>This has been done throughout the text, by adding goals to actions, where relevant.</td></tr>
<tr><td>Finland (Laura Saijonmaa)</td><td></td></tr>
<tr><td>The list of measures (35 + 17) seems comprehensive, but fragmented in terms of feasibility.</td><td>What is meant by fragmented? Do they mean differing with respect to how easy they are to implement? I don’t understand what they would like us to do.</td></tr>
<tr><td>The effectiveness of the measures is difficult to assess due to the lack of research data and should be developed in the next phase.</td><td>Agreed. The following has been added to the introduction:
”The effectiveness of the suggested actions has not been evaluated, as this it difficult at present. This is related to the indicators, which are not yet fully developed. Once the indictors are better developed (listed as actions below), it will become possible to describe how the remaining actions link to the indicators and thereby assess the effectiveness of the actions”.</td></tr>
<tr><td>The list of measures should be simplified, eg by prioritizing (effectiveness) and scheduling measures by type of noise.</td><td>This is a major restructuring. We could try to develop a table to add. I don’t think we are in a position, where we can prioritize based on effectiveness. Partly addressed by the addition listed above.</td></tr>
<tr><td>Some measures require sufficient source information to be realized appropriately. A block diagram would illustrate what source information is required for each measure and which of the other measures provide that input data. A review of measures could be done for an individual species to illustrate the point.</td><td>I take that by “source” they refer to background information about the noise source, impact and mitigation, not information about the source itself. This will be very large, if it should contain everything.</td></tr>
<tr><td>Poland (Agata Swiecka)</td><td></td></tr>
<tr><td>Add new action
2.4 Regional actions involving third parties
<table>
<tr><th>CODE</th><th>REGIONAL ACTION</th><th>FURTHER SPECIFICATION</th></tr>
<tr><td>36</td><td>Establish a discussion between HELCOM and NATO to develop international guidelines for the</td><td>Initiate discussions on the use of noise mitigation measures, as well as informing nature protection institutions about</td></tr>
</table></td><td>Welcomed addition. Has been combined with suggestion below from EN-Noise.</td></tr>
</table>

	removal and detonation of ammunition	planned detonations and mitigation methods.	
Denmark (Lonnie Mikkelsen)			
At Pressure, Denmark stated the following: With respect to point 2,1, action 8 (at page 6): ”Establishment of common reporting system for planned activities likely to produce impulsive noise”. DK would like to point out that reporting only applies to activities that requires an Environmental Impact Assessment and should be noted in the description on the right. As I am notsure if this applies to all HELCOM countries, it might not be necessary to state this in the RAP. However, as no minimum requirement has been set with respect to which activities that should be reported, I wish to highligt to the Secretariate, that the national implementation of this action, will only apply to impulsive activities that requires an EIA in Denmark. For activities that do not require an EIA, we encorage reporting, but this is not a requirement.		This has been clarified by changing the text to: “This constitutes an extension of the impulsive noise register to include future activities that today are only recorded after they occurred”. This implies that whatever national practice applies to the register today will also apply to the extended register.
EN-Noise (Sven Koscinski)			
New Action 11: REGIONAL ACTION Establish a discussion between HELCOM and NATO about binding requirements and voluntary actions for use of noise mitigation technologies and operating practices for munitions clearance in the Baltic FURTHER SPECIFICATION Includes, but not limited to, discussions on deterrent measures, abatement technologies, spatio-temporal planning of clearance operations in relation to ecosystem sensitivity. Initiate discussions on feasibility of reducing the impact on biota without compromising navigational safety.		Essentially the same as the suggestion from Poland. The two suggestions have been combined into one.
CCB			
The Regional **Action** Plan should be more mitigation measures oriented, given the commitment from 2013 Copenhagen Ministerial agreeing that **“human activities that are assessed to result in negative impacts on marine life should be carried out only if relevant mitigation measures are in place”**. Otherwise, it should not me called an Action Plan		There are differences here between impulsive noise and continuous noise. For some impulsive noise sources, several efficient mitigation measures exist and the implementation of these are highlighted as actions 6-10 + 30. For continuous noise, there is still limited knowledge on the magnitude of the problem, the cost-efficiency of measures and implementation is difficult, as it involves IMO. Nevertheless, there are concrete actions, such

	as 22 and 23, which directly targets commercial shipping (through a dialog with IMO).
The RAP should be well coordinated with relevant HELCOM Groups as it seems it was not the case yet, given the attitude to it from MARITIME experts. We think that presenting it widely to e.g. also HELCOM/VASAB MSP WG would certainly make sense in introducing spatial restrictions of noise generating activities. Otherwise involvement of STATE & CONSERVATION and PRESSURE only would not make an impact on development and application of concrete mitigation measures (cf. the same ministerial commitment above).	We can only agree that coordination is useful. We have obtained and incorporated input from MARITIME and is actively seeking coordination with EN-MAMA. As the plan is ultimately to be adopted by HOD and fed as input to the BSAP update, it is, however, difficult to see why the origin in a network referring to PRESSURE, rather than something else, should prevent actual actions from being taken.
p 2. Added to text: “Mitigation measures already in place in national waters of HELCOM Contracting Parties should be considered as examples of Best Environmental Practice (BEP) and checked for their applicability at regional level. Regulations to limit noise at source will encourage alternative methods which generate less underwater noise for all activities. For example, alternatives to impact pile driven monopile foundations should be considered alongside other noise reduction methods for piling and Marine Vibroseis should be fully examined as an alternative to airguns for seismic surveys.”	Added to text: “Several mitigation measures are already implemented nationally and has served as efficient incentives to development of mitigation techniques and alternative technologies. These examples should be evaluated as candidates for Best Environmental Practice and implemented, where appropriate”. Vibroseis has its own problems and it does not seem appropriate to mention it specifically in the introduction. It is included under action 6 (alternative seismic sources).
P 2. added to text: “Some operational measures (such as speed limits for ships) result in savings by reduced fuel consumption. Possible further savings could be achieved if incentives are set such as a reduction in port fees for ships emitting less noise (such as in the Port of Vancouver ECHO Program)”.	The comment on fuel consumption is not relevant for the UW noise RAP. The ECHO project is specifically mentioned under action 22. An addition to the introduction has been added, to exemplify the operational measures: “... such as re-routing and speed regulation,...”.
Action 3. Text added: “Underwater explosions of unexploded ordinances (UXOs) should be avoided and limited based on an EIA and only with respective mitigation measures concerning noise and hazardous substances”	This action is about assessment and the comment is thus not relevant here.
Action 4. Text added: “Set clear threshold for the whole Baltic Sea based on best available standards and implement it with immediate effect”.	The suggested addition appears to suggest that national injury thresholds are adopted as GES thresholds, but this is inappropriate. Action 4 deals with criteria and thresholds for GES. Injury is addressed under action 10.
Action 7. Text added: “Examples of BEP are: - application of noise abatement systems during pile driving as demonstrated by Germany	These comments belong under action 6, not 7. The two first measures can be included in the introduction. The fact that there are climate issues with oil and gas exploration is irrelevant to the UW noise RAP and should not be included.

- mandatory use of bubble curtains or other mitigation measures when exploding Unexploded Ordnance (UXOs) - ban air gun surveys for oil and gas exploration as it does not comply with climate goals - use of alternative technology for other geological surveys if needed	There is currently no operational alternatives to airguns, i.e. there is no BEP to adopt.
Action 9. Text added: “Any activity generating impulsive sound should be coupled with adequate mitigation measures. Measures to reduce noise pollution within and outside MPAs for noise sensitive species should be put in place, such as annual seasonal closures, reduced speed, re-routing, sonar regulation, and buffer zone around the MPAs for impulsive noise”.	It is specifically mentioned that this action gives stricter protection inside MPAs, in addition to the measures identified under action 6 and adopted under action 7, which should be adopted everywhere. May need some clarification.
Action 30. Text added: “Sound emission through leisure boats should be reduced with immediate effect, e.g. through speed reductions, spatio-temporal closures and the limitation of sonar use in certain areas and to frequencies above 150 kHz”.	This is already addressed through voluntary national action 8. This type of regulation is best done at national level, as the specifics of the problem and possibilities to solve it differs significantly between countries.
Action 35. Text added: “Limitation of sonar use in certain areas and to frequencies above 150 kHz”	This action is about standards for echosounders, sonars and engines, not about their use. It is a necessary requirement for regulating use of echosounders that there is a possibility to turn off the echosouonder and a classification of outboard engines must be established, before one can regulate the use of such engines.
Voluntary national action 7. Text added: Sound emission through leisure boats should be reduced with immediate effect, e.g. through speed reductions, spatio-temporal closures and the limitation of sonar use in certain areas and to frequencies above 150 kHz	This belongs in action 8, not action 7. Can be integrated into action 8.
Voluntary action 16. Text added: “Setting safe frequency range when using military sonars”.	There is probably no safe frequency range for antisubmarine sonars.