

Interim report on sea-dumped munitions for the 29th BSPC



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The Baltic Sea Parliamentary Conference (BSPC) was established in 1991 as a forum for political dialogue between parliamentarians from the Baltic Sea Region. BSPC aims at raising awareness and opinion on issues of current political interest and relevance for the Baltic Sea Region. It promotes and drives various initiatives and efforts to support a sustainable environmental, social and economic development of the Baltic Sea Region. It strives at enhancing the visibility of the Baltic Sea Region and its issues in a wider European context.

BSPC gathers parliamentarians from 11 national parliaments, 11 regional parliaments and 5 parliamentary organisations around the Baltic Sea. The BSPC thus constitutes a unique parliamentary bridge between all the EU- and non-EU countries of the Baltic Sea Region.

BSPC external interfaces include parliamentary, governmental, sub-regional and other organizations in the Baltic Sea Region and the Northern Dimension area, among them CBSS, HELCOM, the Northern Dimension Partnership in Health and Social Well-Being (NDPHS), the Baltic Sea Labour Forum (BSLF), the Baltic Sea States Sub-regional Cooperation (BS SSC) and the Baltic Development Forum.

BSPC shall initiate and guide political activities in the region; support and strengthen democratic institutions in the participating states; improve dialogue between governments, parliaments and civil society; strengthen the common identity of the Baltic Sea Region by means of close co-operation between national and regional parliaments on the basis of equality; and initiate and guide political activities in the Baltic Sea Region, endowing them with additional democratic legitimacy and parliamentary authority.

The political recommendations of the annual Parliamentary Conferences are expressed in a Conference Resolution adopted by consensus by the Conference. The adopted Resolution shall be submitted to the governments of the Baltic Sea Region, the CBSS and the EU, and disseminated to other relevant national, regional and local stakeholders in the Baltic Sea Region and its neighbourhood.

Contents

1.	Introduction	5
2.	Resolution of the 28 th BSPC / item 24	7
3.	The rapporteur's mandate on sea-dumped munitions	7
4.	Implementation of the 28th BSPC-Resolution by the states	8
5.	Implementation of the 28th BSPC-Resolution by the CBSS	9
6.	Current projects on dumped munitions in the Baltic Sea	10
6.1	Expert group SUBMERGED at HELCOM	10
6.2	DAIMON project I + II	11
6.3	BASTA project	11
6.4	Open Spirit	11
6.5	ExPloTect	12
6.6	ProBaNNt	12
6.7	RoBEMM	12
6.8	MUNITECT Network	12
6.9	AMUCAD - Ammunition Cadastre Sea	13
7.	Sea-dumped munitions and maritime economics	14
7.1	Fisheries	14
7.2	Shipping	14
7.3	Offshore infrastructure	14
8.	Germany's HELCOM Chairmanship 2020 - 2022	15
9.	Role of the European Union / EUSBSR	16
10.	Conclusion	17
11.	Next steps	18
12.	Bibliography	19
13.	Attachements	20
13.1	Statements on item 24 of the Resolution of the 28th BSPC	20
13.2	MUNITECT network position paper	23
13.3	AMUCAD Presentation	23

1. Introduction

This interim report deals with the issue of dumped munitions and unexploded ordnance in the Baltic Sea. As it was prepared under the conditions of the Covid-19 pandemic, unfortunately, I could not carry out every trip to the Baltic states as planned in the first place. Thus, many personal meetings and talks had to be cancelled or at least postponed. In certain cases, it was possible to dodge on telephone or video call, but this was no substitute for intensive exchanges with experts in the research facilities on site. As soon as the pandemic allows it to happen again, this should be made up, if possible, by the 30th BSPC and the results will be incorporated into the final report.



Peter Stein

For these reasons, I had to exchange views and had been informed about the latest developments in the relevant field primarily with and by German representatives from politics, science and industry. The framework of this interim report would be blown up if all conversations and collected information were listed in detail. A comprehensive annexe is attached to this, primarily through internet links. Without the great support of research, science, administration and industry, it would not have been possible to produce this report in its present form. I am very grateful for the numerous tips and technical advice.

As we all know, knowledge of the significant hazards posed by the munitions loads in the Baltic Sea is not new. In historical archives of various countries, it is partly very well documented, where since the end of the 19th century what kind of ammunition was dumped. Military historical archives or naval archives are an essential source. But, of course, not everything has been fully and properly documented in the course of history, especially if we look at the whole spectrum of munitions in the sea, that consists warfare agents, but also a large number of unexploded ordnance, sea mines and ammunition residues in shipwrecks, sometimes also in secrecy. This explains why there is a reliable figure for chemical weapons dumped in the entire Baltic Sea by around 40,000 tons. But currently none for the total mass of conventional ammunition introduced due to various military activities since 1862. The stresses of these dangerous legacies also pose an increasing danger to humans and the environment due to progressive corrosion. They also put the maritime economy at risk, whether it be shipping, fishing or the expansion of offshore wind turbines.

In recent decades, the national authorities of the Baltic Sea countries have gained a lot of experience and expertise in dealing with munitions found in the Baltic Sea. Various national and multinational research programmes are being implemented to address the threat situation and to carry out a risk assessment, to demonstrate harmful effects on

humans and the environment and to make recommendations for action. In February 2019, the results of the European Union-funded INTERREG Baltic Sea Region research project DAIMON (Decision Aid for Marine Munitions) were presented. Researchers from Poland, Germany, Finland, Sweden, Lithuania, Russia and The Netherlands (Netherlands represented by the INGO IDUM, The Hague) were involved. The follow-up project DAIMON 2 (2019-2021) is now underway primarily to distribute findings and methodologies on munitions in the sea within the Baltic Sea Region (BSR). Another prominent multinational project is that of the expert group SUBMERGED (Expert Group on Environmental Risks of Hazardous Submerged Objects) which is carried out under the supervision of HELCOM RESPONSE. Both will be discussed in more detail on the following pages of this interim report. Other projects such as BASTA and MUNITECT and others are presented in this report in broad outlines as well.

The research results, such as DAIMON's in conjunction with the resolution of the 28th BSPC, triggered a new and welcome dynamic to address the problem of dumped munitions more intensively. Since then, it has been pleasing to see an increase in public interest in the pressing issue. In Germany alone, the topic was reported about 50 times in regional and supra-regional print and online media between the beginning of 2019 and the first half of 2020. The public interest peaked in late summer 2019 after 39 BRITISH MK I-VII sea mines, were blown up in the run-up to a NATO manoeuvre at the bottom of the Fehmarn Belt. After the blasts, 18 dead porpoises were found, and the question of environmental compatibility, as well as responsibilities, was openly discussed.

As mentioned this interim report provides a general overview of the current situation and existing challenges in dealing with the legacy, presents a selection of ongoing research projects and results in broad outlines and provides an insight into the current state of the art.

Following the 28th BSPC resolution, a conclusion is drawn on the state of implementation and, finally, a proposal is drawn up on how the existing knowledge and technology can be used efficiently by the Baltic Sea countries to solve the problem of sea-dumped munitions and unexploded ordnance in the Baltic Sea.

Peter Stein

Member of the German Bundestag
BSPC Rapporteur on Sea-dumped Munitions

2. Resolution of the 28th BSPC / item 24

At the 28th Annual Meeting of the BSPC in Oslo, all delegations agreed on a resolution¹, which was unanimously adopted on 27th August 2019. Item 24 of this resolution deals with the issue of munitions in the Baltic Sea. It stated the intention to develop a transnational and sustainable strategy for dealing with the dangerous legacies. In addition, the Baltic Sea Council (CBSS) is prompted to examine ways of financing to enable monitoring, securing, salvage or destruction of warfare material. As a further objective it was formulated that a commission of experts shall evaluate the results of the monitoring, conduct an annual risk analysis and make appropriate recommendations for action.

3. The rapporteur's mandate on sea-dumped munitions

In November 2019, the Standing Committee of the BSPC met in the Reichstag building in Berlin to appoint, as agreed, a rapporteur on the topic of “sea-dumped munitions”. Peter Stein, a member of the German Bundestag, was chosen for a length of two years. Mr Stein, who comes from the Eastern German Hanseatic city of Rostock, has already worked intensively on the subject in recent years and has worked to ensure that consequences of munitions in the Baltic Seas given a prominent position in the resolution of the 28th BSPC.

The specific mandate associated with the election of the rapporteur is to monitor developments in the field of sea-dumped munitions, to keep an eye on the implementation of the recommendations of the 28th BSPC and to submit an interim report to the 29th BSPC in Vilnius.

Peter Stein has also set himself the goal of identifying the possibilities for implementing item 24 of the resolution through intensive exchanges with international actors in the field of dumped munitions and unexploded ordnance. The aim is also to develop conditions under which the Baltic Sea states can agree on a common approach to solving the problem.

All considerations will take into account, for a longer period of time, that the economic impact of the Covid-19 pandemic poses an additional challenge to the costly recovery of warfare material. However, the calculation must include that not acting now will increase the long-term costs for all Baltic Sea states. The advance of corrosion, the release of munition compounds, mobility and increasing sludge make detecting and mountaineering increasingly difficult and expensive. The slogan of Peter Stein is: we probably still have 20 years left to take action, but in total, we will have to deal with over the next 100 years. It **MUST** be started now!

1 <https://www.bspc.net/conference-resolution-28-bspc-adopted-270819/>

4. Implementation of the 28th BSPC-Resolution by the states

By the end of July 2020, a total of twelve responses from the Baltic Sea states had been received by the BSPC Secretariat.² As soon as further statements are available, they will be taken into account in the further reporting.

In addition to the Federal Government of Germany, the state governments of the German federal states of Hamburg, Western Pomerania and Schleswig-Holstein have also expressed their views on item 24. Within the received eight national statements there is no reference to item 24 of the 28th BSPC resolution in the Norwegian one, which is why it is not relevant to this interim report. In this case, too, the procedure will be as such that a statement received after the cut-off date will be included in the further reporting.

The statements received show that the issue of dumped munitions in the Baltic States is sometimes handled differently. There is no doubt, however, that all states have recognised the problem and the need for a solution. The scope of the particular statements allows a conclusion to be made as to the intensity with which the topic is being worked on and which actors are involved. In some cases it is a purely military matter, but in others many civilian actors and scientists are involved.

With regard to the suggestion from item 24 of the 28th resolution to create a coordinating body for the management of sea-dumped munitions, the statements are clear. Here, it is argued that existing structures, namely HELCOM, should be built on.

Taking up this demand, as a first step Mr Stein has already exchanged views with the Secretary General of HELCOM, Rüdiger Stempel, on the suitability of HELCOM's structures. Unfortunately, a planned visit by Mr Stein to the HELCOM Secretariat in Helsinki could not be carried out for the time being due to the current travel and contact restrictions caused by the Covid-19 pandemic. However, these initial discussions with HELCOM are positive and give hope that the existing HELCOM RESPONSE structures around the expert group SUBMERGED are suitable or can be adopted to the requirements.

2 <https://www.bspc.net/conference-resolution-28-bspc-adopted-270819/>

5. Implementation of the 28th BSPC-Resolution by the CBSS

The CBSS (Council of the Baltic Sea States) met on 19th May 2020 due to the effects of Covid-19 virtually and not as planned on the island of Bornholm. The Foreign Ministers of Denmark, Estonia, Finland, Germany, Iceland, Latvia, Lithuania, Norway, Poland, Russia and Sweden, as well as senior representatives of the European Union, were present.

The handling of the effects of the Corona pandemic was largely determined by the virtual meeting and therefore the issue of warfare agents in the Baltic Sea could not be dealt with intensively. The final Bornholm Declaration³ therefore makes no reference to this, which, from the point of view of the rapporteur Peter Stein is expressly regretted. According to information from participants and official statements from the German Foreign Minister Heiko Maas⁴, however, the topic was nevertheless discussed, in particular with regard to avoid the environmental impact. The Bornholm Declaration also welcomes Germany's takeover of the HELCOM presidency, which will give high priority to the acute environmental issues in the Baltic Sea ecosystem.⁵

Mr. Stein considers positive the fact that CBSS successfully completed the reform process in May 2020 launched in the year 2018. The reform process of the CBSS involved expressing its intention to cooperate more flexible and closer together with the other forums and formats in the Baltic Sea region such as the BSPC.

3 <https://www.cbss.org/wp-content/uploads/2020/05/Bornholm-Declaration.pdf>

4 <https://www.auswaertiges-amt.de/en/aussenpolitik/maas-cbss/2343282>

5 <https://www.cbss.org/wp-content/uploads/2020/05/Bornholm-Declaration.pdf>

6. Current projects on dumped munitions in the Baltic Sea

6.1 Expert group SUBMERGED at HELCOM

The HELCOM expert group SUBMERGED⁶, which is co-chaired by Germany, Finland and Poland, follows the expert group HELCOM MUNI, which focused on chemical ammunitions. SUBMERGED focuses on all kinds of hazardous objects, most prominently sea dumped ammunition and wrecks, which may affect the environment and human activities in the Baltic Sea. A main task of the group is to produce an assessment of these hazardous submerged objects. The group is currently preparing the assessment report. It consists of a comprehensive overview of the status quo of sea dumped ammunition in the Baltic Sea and most recent research results regarding the issue. Experts who generated the results during the UDEMM, RoBEMM, DAIMON, MODUM, CHEMSEA and other projects are involved as authors and reviewers for the chapters covering their respective scientific disciplines. Furthermore, every HELCOM member state was given the opportunity to present scientific projects, ongoing national efforts, relevant laws and norms as well as responsible authorities. Finally, the report contains recommendations. The following preliminary recommendations will be given:

- Initiate joint archive research and exchange of historical files that are relevant for the issue
- Develop and implement a coordinated monitoring scheme both for known contaminated sites and during clearance activities
- Initiate large scale surveying efforts of dump sites, other contaminated sites and suspected sites
- Introduce an international ammunition cadastre and establish a federated munition database
- Develop new technologies for salvage, clearance and thermal treatment
- Provide treatment facilities for cleared and salvaged munition
- Provide (offshore) test infrastructure for EOD technologies
- Develop a European quality guideline for EOD processes
- Consumer protection (eco and human toxicology, food chain analysis)
- Information campaigns for the public and affected stakeholders

The HELCOM SUBMERGED expert group's mandate will expire in 2020 and requires an extension to ensure regular reassessment of the situation of sea-dumped ammunition in the Baltic Sea and new research findings.

6 www.helcom.fi/wp-content/uploads/2019/08/Terms-of-Reference_SUBMERGED.pdf

6.2 DAIMON project I + II

DAIMON⁷ (Decision Aid for Marine Munitions) was an international project consisting of partners from Poland, Germany, Finland, Sweden, Lithuania, Russia and The Netherlands and cooperating experts worldwide. This project was partly financed by the EU INTERREG Baltic Sea Region Programme 2014-2020. The question which DAIMON takes up is how to proceed with the identified and mapped munition objects. Since there cannot be a general answer to this question, DAIMON analysed identified and localized objects with artificial intelligence incorporating large amounts of spatial and non-spatial datasets based on latest scientific research. For each detected munition object, the software that was developed formulates a risk assessment, incorporating information about the localization and overall state of the ammunition, the surrounding environment and state of biological pollution/damage. DAIMON follows an integrative approach and incorporates the results of previous projects for an efficient use of data and a consecutive development of knowledge. DAIMON II is the ongoing extension of the project, which is aimed at disseminating project results to relevant decision makers in Baltic Sea nations. For this purpose, a week of workshops was planned for August 2020 in Germany but had to be postponed to May 2021 due to the CoVid-19 outbreak. Workshops in Finland late summer 2020 and in Poland in autumn 2020 are still under preparation. Please refer to www.daimonproject.com for further information.

6.3 BASTA project

BASTA⁸ (Boost Applied munition detection through Smart data in Tegration and AI workflows) aims at advancing the approach for munition detection both on local and a larger scale. The project seeks to advance data acquisition through ultra-high-resolution 3D sub-bottom profiling (SBP) and intelligent autonomous underwater vehicle (AUV) based magnetic mapping as part of an adaptive and iterative survey approach. In addition, it will foster sustainable use of survey and historical data within a multi-sensor database. Conducting data analysis of big data by means of artificial intelligence will lead to new approaches in detection and identification of munition. New tools, methods and workflows will be discussed with stakeholders, with the aim of formalizing recommendations for munitions detection for industry and government players.

In order to achieve these ambitious targets a consortium of GEOMAR Helmholtz Centre for Ocean Research (project lead), Flanders Marine Institute (VLIZ), EGEOS GmbH, G-tec SA has been formed. The project is funded for the duration from December 2019 until November 2022 by the European Maritime and Fisheries Fund (EMFF) of the European Union in the „Blue Labs“ program.

6.4 Open Spirit

The OPEN SPIRIT series of activities rotates between respective Baltic nations in such a manner that Estonia, Latvia and Lithuania host this activity every third year. The countries' navies make an effort to combine their national mine countermeasure training activities with domestic efforts to gradually reduce possible risks posed by warfare materials through a tailored, systematic and effects based approach. These activities are targeted at most risk prone areas but are time and resource consuming. Hence, given the best available knowledge regarding the likely amounts of warfare materials in the sea, these activities will most likely continue in the near future.

7 www.daimonproject.com

8 www.basta-munition.eu

6.5 ExPloTect

Starting in December 2019, GEOMAR coordinates the three-year ExPloTect⁹ project (funded by EASME/EMFF), which will develop a prototype system for shipboard, near-real-time detection of dissolved explosive compounds and chemical warfare agents in seawater. Additional partners are K.U.M. Umwelt- und Meerestechnik Kiel GmbH (Germany) and RPS Explosives Engineering Services (UK). ExPloTect (Ex-situ, near-real-time explosive compound detection in seawater) is a flexible platform adaptable to explosive compounds, as well as chemical warfare agents, based on a high performance liquid chromatography-mass spectrometry method.

6.6 ProBaNNt

GEOMAR (Germany), SeaTerra GmbH (Germany), IO PAS (Poland) and OBR CTM (Poland) were invited to propose a three-year project to the MARTERA call funded by the ERA-NET COFUND. ProBaNNt proposes to transform the decision-making process during explosive ordnance disposal, which is currently heavily experience driven, non-rigorous and intransparent, into an objective, structured, well-informed procedure. For this purpose, the consortium plans to create an EOD database to enable Bayesian Neural Network driven assessment of finding optimal clearance methods. Furthermore, photomosaics shall be created to provide EOD experts with 3D-models of sea-dumped ammunition – an entirely new resource for decision making. Finally, sediment mobility analysis will allow to predict potential spread and distribution of toxic munitions contaminants that are present in the sediment.

6.7 RoBEMM

The project RoBEMM (Robotic underwater salvage and disposal process with the technology to remove explosive ordnance in the sea, in particular in coastal and shallow water) was driven by the idea of developing a procedure that allows for the inexpensive clearance of warfare materials from the seabed. Partners were Heinrich Hirdes EOD Services GmbH, Automatic Klein GmbH, Fraunhofer Institute for Chemical Technology and Leipzig University. GEOMAR acted as an associated partner. It was the declared target that the clearance should be performed in a fully automated fashion. Another aim was to ensure on-site disposal, which would prevent the transport of hazardous explosive materials both at sea and land. During the project, tests for friction and impact sensitivity of explosives were conducted. These indicated, that treatment of the warfare materials in question had to be conducted in a very sensitive fashion. The main result was a concept for the treatment of warfare material with a delaboration unit which would allow for the safe handling of explosives under water. During the RoBEMM sub-project OffVali a validation procedure for explosive ordnance disposal (EOD; i.e. ammunition clearance) was developed.

6.8 MUNITECT Network

The Munitect network¹⁰, which is supported by the federal government of Germany, is an association of companies and research institutions driving the development of economically effective munitions detection and handling systems for underwater use. By means of the cooperation, the competences and variety of experiences from the network partners' different industries are bundled and experiences are shared.

9 www.explotect.eu

10 www.munitect.de/en/home#munition_under_water

Within the scope of the network, the members initiate and develop application-oriented research and carry out development projects together with national and international project partners. They make a sustainable contribution to the goal of solving the problem of the old military munitions at large. After setting the focus on efficient detection systems in the first phase, the partners now aim for quality management for underwater UXO handling and efficient clearance (systems and procedures).

In this way, the partners involved contribute to the safety of activities in the economic exploitation of the North and Baltic Sea.

6.9 AMUCAD - Ammunition Cadastre Sea

The basis for the planning and implementation of future actions is a holistic digital system, which provides efficient access to large amounts of historical data as well as current data from environment, economic and hydrographic sectors. Therefore, the Ammunition Cadastre Sea (AmuCad.org¹¹) was developed. AmuCad.org is designed as the central data hub in the global network of industry, science, authorities and NGOs regarding ammunition in the sea. Key functionalities are the management and analysis of large amounts of various types of spatial and non-spatial data. Especially historic datasets e.g. documents, reports and maps are of high relevance for understanding the legacy of the WWI and WWII. Therefore, an AI-based intelligent handling was developed. Connecting and analysing these historic documents is particularly difficult due to the amount and complexity. Therefore, recent developments from the field of artificial intelligence and object character recognition using neural networks and GPU-based technologies are applied. The resulting datasets can afterwards be managed, combined and analysed by means of current technologies and will be available in AmuCad.org. Besides historic data also large amounts of new datasets are incorporated into the system. In combination with the use of artificial intelligence, modern sensor systems and web-based technologies it provides a comprehensive platform that enables an understanding of the current state of the oceans, acts as a tool for planning and serves as a centralized tool for monitoring purposes. AmuCad.org is an industry driven project and became the centralized platform for European research projects due to its unique approach and developed technologies. Compared to national developed and organized systems, AmuCad.org is already existing, technologically proven and does not know administrative borders or political restriction. This reflects the connected ecosystems and complex interactions in the marine environment in the optimal way. AmuCad.org acts also as a hub for applied research and brings together independent scientific research projects on a centralized platform. Therefore, it is involved in several international and national research projects due to its conceptual ideas and uniqueness e.g. BASTA, DAIMON I+II, NorthSeaWrecks, EXPLOTECT. The results of the research projects are either integrated into AmuCad.org by storing their datasets or developing specific applications based on their research results. By integrating research activities, the most recent developments in science are made available to all relevant stakeholders. Behind the following link there is detailed information about AmuCad.org available as well as about international projects incorporated into AmuCad.org: www.amucad.org/about/amucad_functionalities_and_projects.pdf

Based on the technological pioneering role, the integration of relevant European research projects and the acceptance in the community, AmuCad.org plays an important role as a central platform and data hub for the topic ammunition in the sea.

7. Sea-dumped munitions and maritime economics

7.1 Fisheries

It is recommended to prohibit fishing in areas in which the presence of sea-dumped ammunition is confirmed or suspected. Fishers may catch munitions or chemical warfare agents and bring them aboard their vessel. Fishers may also accidentally relocate ammunition. Reducing this risk can be achieved by marking dump sites as areas where fishing and anchoring are not allowed. Furthermore, the size of dump sites should be updated on nautical charts on a regular basis. An information leaflet on the prevention of accidents involving fishers was developed by HELCOM CHEMU. Poland, Sweden and Finland developed national fishermen's guides. The target was to prevent lifting sea-dumped munitions aboard fishing vessels in the first place. They also provide guidance on required actions in case sea-dumped munitions are hoisted aboard. Finally, for purposes of consumer protection control procedure should be established, to ensure that no significant traces of munitions contaminants are present in sea food.

7.2 Shipping

Despite the wide distribution of sea-dumped ammunition in the Baltic Sea, shipping is considered safe, since the risk of detonation is connected to impacting ammunition items. Reports on spontaneous detonations exist, have however never been scientifically proven. Some experts emphasizing an increasing risk of such events, due to aging processes. These processes intend to decline the chemical stability of omnipresent explosives. The Baltic Sea states are recommended to further minimize the risk by keeping shipping lanes free from ammunition, e.g. by relocating munitions items.

7.3 Offshore infrastructure

Operating and constructing offshore-infrastructure, such as pipelines and wind parks, in the Baltic Sea requires the development of a protection strategy against impacts from potentially present sea-dumped ammunition. The strong interference with the seafloor during construction may lead to detonation of ammunition items. Costs of pipeline, cable or wind park disruption are predicted to exceed costs for pipeline protection. A protection strategy is therefore in the infrastructure operators' best interest. For the North European Gas Pipeline, the pipeline route was determined by intense surveying, by intense surveying to prevent accidents and manage risks especially in munitions contaminated sections of the pipeline route. Baltic Sea states should establish new guidelines, requiring proper risk management regarding munitions and explosives of concern during construction and operation of offshore infrastructure.

8. Germany's HELCOM Chairmanship 2020 - 2022

On July 1, 2020, Germany took over the HELCOM presidency for two years. The presidency is carried out by the German Federal Environment Agency. The state governments of the German federal states of Schleswig-Holstein and Western-Pomerania, which are located on the Baltic Sea, each holds the vice presidency for one year and works closely with the federal government on the individual key issues.

According to the German Federal Government¹² the work of the Finnish Presidency will be seamlessly linked to the German Presidency and the revision of the 2007 Baltic Sea Action Plan will be finalized accordingly. In addition, the emphasis is placed on individual focus areas, which have also been taken up in the condition assessments HOLAS (Holistic Assessment of the Ecosystem Health of the Baltic Sea) that have been carried out since then. In the „Priorities of the German Chairmanship of HELCOM“¹³ „warfare materials“ and „munitions“ are explicitly named as pending challenges.

The basis for working on the main topic of contaminated ammunition for Germany is the report Munitions in German Marine Waters - Stocktaking and Recommendations (Link: www.underwatermunitions.de) by cross-administrative working group „munitions in the sea“ and its annual updates.

The research results published at the beginning of 2019 are now fuelling concerns about the negative effects of munitions in the sea on the Baltic Sea ecosystem. Effects on the food chain and possibly on human health cannot yet be adequately assessed and require further investigation.¹⁴

According to the German Federal Government, no large-scale threats to humans and the environment can be detected outside of known hotspots or former dumping grounds, but pollution of the sea water with compounds typical of explosives, such as TNT, can be detected.¹⁵ In the meantime, fears have materialized that, although limited in space, especially in the well-known subsidence areas, there is pollution of the Baltic Sea ecosystem and marine life, e.g. fish and mussels. On the basis of the precautionary principle, action can therefore be required even without legal obligation. The handling of munitions in the sea is the responsibility of the respective coastal (federal) state, but a transfer of knowledge and technology across the Baltic Sea as well as a joint strategy development are desirable, according to the German Federal Government. This coincides with the resolution of the 28th BSPC on this point.¹⁶

The first national findings were incorporated into HELCOM's relevant work as early as 1993 under German leadership. In 1995 an ad hoc working group on this subject presented the so-called CHEMU report. The HELCOM CHEMU report was updated by 2013 and eventually succeeded by HELCOM MUNI. In the same year, the HELCOM SUBMERGED expert group was set up under the RESPONSE working group, which has continued to work since then. At the same time, research was carried out by or with the participation of HELCOM (e.g. MERCW, CHEMSEA) and guidelines on risks and how to deal with them were provided for fishermen. The focus was on chemical warfare agents.

As mentioned above Germany will make the subject of “ammunition waste” a focus of the two-year

12 Source: Bundesministerium für Umwelt, Naturschutz und Nukleare Sicherheit

13 <https://helcom.fi/about-us/chairmanship/germany-2020-2022/>

14 Source: Bundesministerium für Umwelt, Naturschutz und Nukleare Sicherheit / German Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

15 Ibid.

16 *ibid.*

HELCOM chairmanship. The main objectives are to improve the data and assessment basis, including inventory, monitoring and modelling, the assessment of toxic effects of compounds typical for warfare agents on the marine environment of the Baltic Sea, as well as accumulation via the food chain and possible effects on humans. The use of bio-indicators is also being investigated. On this basis, accompanied by socio-economic analyses, options for action are to be developed. After joint observation, prioritization and risk assessment and subsequent identification of hotspots, these also include the pilot recovery and destruction of old ammunition. It is planned to accompany this with the provision of information for the public. Also projected is an interdisciplinary and inter-regional exchange on procedures and approaches of the HELCOM contracting parties on best practice of monitoring, risk assessment and recommendations for further measures.

9. Role of the European Union / EUSBSR

In the Baltic Sea Strategy EUSBSR, the European Union also identifies conventional and chemical warfare agents in the Baltic Sea as a threat to the ecosystem. On July 30, under the German chairmanship, the new action plan for the EUSBSR¹⁷ was approved by the group of the national coordinators (NC group). The topic of ammunition is explicitly mentioned in “action 2”.¹⁸ The DAIMON II project is mentioned as well as the fact that the matter is closely related to the activities of HELCOM. As a result of the inquiries, the German chairmanship of the EUSBSR with regard to the subject of „old ammunition“ will be exercised in accordance with the German presidency at HELCOM.¹⁹

According to the action plan, environmental issues are currently financed through the INTERREG, BONUS / BANOS programs, Swedish Institute, CBSS PSF, LIFE, HORIZON EUROPE programs. Peter Stein is currently in talks with members of the European Parliament in order to explore further financing options from EU funds for new projects for dealing with the environmental pollution of our seas, especially with sea-dumped munitions. Results of the explorations will be included in the final report for the 30th BSPC.

17 <https://www.balticsea-region-strategy.eu/attachments/article/591126/EUSBSR%20Action%20Plan%20%20NCG%20agreed%20final%20version%2006%2007%202020%20PDF%20ht.pdf>

18 *ibid.*

19 *ibid.*: Auswärtiges Amt / German Federal Foreign Office

10. Conclusion

A relatively clear picture can be drawn from Peter Stein's reporting. It should be noted that the topic has been researched internationally for several decades and a large number of important insights have been gained about harmful effects, previously focussing on toxic effects of warfare agents and more recently also on the much larger quantity of conventional munition compounds on the ecosystem of the Baltic Sea. The technology for detection and recovery has improved a lot in recent years, especially through digital processes. The clear picture also includes the fact that most of these remarkable advances are only known in specialist circles. There is almost no widespread public perception. Occasional events, such as the incident in summer 2019, throw no more than a spotlight when Baltic Harbour Porpoises have most probably died as an avoidable consequence of a large historic ordnance disposal operation. Or when accidents occur in which bathers on the Baltic Sea beach mistake phosphorus for amber and suffer serious injuries. These high-profile events make it clear that in Germany there is also a great, if not sustainable, awareness of the existing risks in the population and that a solution is fundamentally desired.

The perception of hazard will increase to the extent that toxins can be found in fish and mussel stocks, protected areas or shipping routes are threatened or the expansion of offshore wind turbines or pipelines is impaired. This goes hand in hand with the increasing public risk awareness regarding plastic waste, microplastics or ghost nets. Support can therefore be sought from the EU Green Deal.

Overall, the rapporteur found that a large number of researchers, institutes, nationally and internationally funded projects and private companies have developed a high level of expertise and that a number of companies offer specialized solutions. There is also a network of interdisciplinary actors among themselves. The question that remains is why, despite existing knowledge and a general awareness of the dangers, no action is taken. The answers are: The responsibilities are complex and diverse and it costs a lot of money. This leads to unexplained structures and lengthy discussions and finally there is a partly different perception regarding the shared historical responsibility between the affected states and the states of origin of the munition objects found to be hazardous.

For the final report on the 30th BSPC in 2021, the aim is to be able to report more on the respective national approaches and measures aimed at. The statements on the resolution of the 28th BSPC are a very good basis. One of the possible further steps would be to search all national archives of the military and the navy more intensively for data on the introduction of large quantities of munitions in the Baltic Sea and to make them available to an international group of experts.

Finally, the final report also will draw attention to the recommendations for action that have already been developed or are work in progress for dealing with the ammunition contaminated sites and wracks, as well as to the newest research results being planned to be published by then.

11. Next steps

The rapporteur Peter Stein suggests the following steps for the further procedure for dealing with sea dumped munitions in the Baltic Sea:

- All current research, findings and results on the topic must be brought together multinationally and the data has to be standardized.
- A comprehensive monitoring of the contaminated sites is to be built up and looked after.
- Research into the use of bio-indicators needs to be intensified.
- A joint, multinational group of experts (science and technology / processes) should be set up which, based on constant evaluation, gives annual recommendations for the targeted, necessary handling of sea-dumped munitions and unexploded ordnance.
- It must be possible to act quickly and in an environmentally friendly manner. Lengthy coordination about responsibilities, clarification of the legal consequences and the search for causers must be eliminated in advance if they are a hindrance to the necessary timeline.
- As a solution, a permanent multinational fund is to be set up to finance the expert group, the monitoring and the respective tender for the treatment of ammunition.
- Exemplary are international donor funds, as they have good experiences in development policy under the umbrella of the UN. In the case of sea-dumped munitions, EU institutions could provide a stable framework, or preferably the structures of HELCOM.
- In a corresponding, voluntary donor round (ideally with the involvement of the EU), an amount of EUR 500 million is to be aimed at initially in order to flexibly finance the initial measures recommended by the experts.
- Current technical developments can lead to a reduction in costs for the recovery and treatment of ammunition by around 80 percent. At the same time, the private sector in the field of marine technology must therefore be involved in the economic process through regular tendering for the proposed measures. This supports constant technological development and added value in our region as a whole.
- The Baltic Sea region can become a pilot region for a sustainable, scientific, technological and value-adding solution to the contaminated site problem of ammunition in our waters as a whole. We find comparable pollution worldwide in many seas, coastal waters, estuaries, harbour areas and lakes.

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13. Attachements

13.1 Statements on item 24 of the Resolution of the 28th BSPC20

13.1.1 Germany - Statement by the Federal Government

The Federal Government would welcome a political consensus among all Baltic Sea countries on the subject of ammunition in the Baltic Sea. At national level, the Federal Government and the coastal Länder have been dealing continuously with the topic of the risk posed by sunken ammunition for a decade, especially in the framework of the Ammunition Expert Group set up by the Federation-Länder Working Group on the North Sea and Baltic Sea. The first detailed report, with the title “Ammunition in German marine waters – taking stock and recommendations”, was published as early as November 2011 and has since been updated on an annual basis. The UDEMM collaborative project (total funding: 1.5 million euros), which concluded in 2019, studied the extent of ammunition contamination in the southern Baltic Sea. Spatial risk maps of the German Baltic Sea and guidelines for evidence-based monitoring have been developed on the basis of measurements and modelling. In light of the decisions taken by the 93rd Conference of Environment Ministers in November 2019, the Federal Government will – on the basis of the Expert Group’s many years of preparatory work and the currently available research findings, particularly the findings of recent months – discuss the way ahead and what action is needed, with an open mind as to the outcome, and will take any measures to counter risks. A further aim is to develop a cross-border, sustainable strategy for dealing with unexploded ordnance in the Baltic Sea. The establishment of a voluntary financing tool might be one option for cooperation. In the Federal Government’s view, dealing with ammunition in the Baltic Sea and North Sea is a task for all of the countries in these regions. We will therefore conduct assessments on this subject and encourage the development of recommendations for action, including in the framework of cooperation under HELCOM and, in particular, through the established structures of the SUBMERGED Expert Group, chaired by Germany.

13.1.2 Estonia

The issue of the detection of unexploded ordnance and buried/deposited ammunition present in the Baltic Sea has been on the agenda of HELCOM. It would be rational to keep the theme in HELCOM framework and not create duplicating activities in other regional cooperation formats.

13.1.3 Finland

Finnish Navy capabilities in mine countermeasures (MCM) have been developed significantly. The Finnish Navy has maintained knowledge of historical minefields and as a part of MCM training continued participation in operations to clear away remaining sea mines from the Baltic Sea. This has been supported by active mapping of the seabed including shipwrecks, in cooperation with the Finnish Environment Institute (SYKE) and other maritime authorities.

13.1.4 Germany - Statement by the Senate of Hamburg city

The Hamburg Senate shares the view that, with regard to the sites contaminated by munitions in the North Sea and Baltic Sea, the introduction of organised salvage is required. At the Environment Ministers' Conference in Hamburg on 14 and 15 November, a corresponding draft, supported by Hamburg, was discussed. In it the environment ministers of the federal states call on the federal government, among other things, to cooperate with the coastal states affected to carry out a comprehensive and site-specific assessment of the condition of munitions to prioritise the possible need for action in the North Sea and Baltic Sea. They consider it expedient, given the hydrological conditions, to focus initially on the Baltic Sea and then to transfer the experience gained to the North Sea as far as is possible. This is to form the basis for the development of joint proposals for the implementation, prioritisation and shared funding of such measures.

13.1.5 Latvia

Since adoption of the resolution, in November 2019, Latvian Naval Forces have organised one historical mine clearance operation in Latvian water (Irbe strait) together with NATO Standing NATO Mine Countermeasures Group One (SNMCMG1) HODOPS LVA. During the operation 56 sea mines were found, from which 43 were destroyed. Overall the search covered 19 square miles.

Furthermore, in May this year (2020) international historical mine clearance operation OPEN SPIRIT is also scheduled to take place.

In the area of anti-min capability development Naval Forces will initiate modernization of 3 mine countermeasures vessels in order to enhance this capability in the future. It has to be noted however that the Naval Forces are executing these tasks in accordance with National Armed Forces Law and there is no direct relation to the resolution.

13.1.6 Lithuania

The UN General Assembly at its seventy-fourth session for the fourth time adopted by consensus the resolution "Cooperative measures to assess and increase awareness of environmental effects related to waste origination from chemical munitions dumped at sea". This is the only resolution submitted by Lithuania to the UN General Assembly. Since 2010, at the UN formats Lithuania raises the question and participates at the discussions on the issue of chemical munitions dumped at the sea.

13.1.7 Germany - Statement by the state of Mecklenburg-Vorpommern

The State of Mecklenburg-Vorpommern supports the DAIMON (Decision Aid for Maritime Munitions) project of the EU Interreg Baltic Sea Region programme. It aims to better evaluate different management options on a scientific basis. The environmental impacts of chemical warfare agents and conventional munitions are studied as a basis for an appropriate risk assessment. The objective of DAIMON is to develop techniques describing the impact of marine munitions on the ecosystem maritime activities and humans as consumers. The State Government of Mecklenburg-Vorpommern keeps the State Parliament of Mecklenburg-Vorpommern informed about the problem in many ways.

13.1.8 Poland

Poland is actively working within HELCOM Expert Group on Environmental Risks of Hazardous Submerged Objects (SUBMERGED). SUBMERGED is now in the process of assessment of number of the hazardous wrecks in Baltic Sea that needs quick actions in order to prevent a mass-scale pollution. Last meeting was held in January this year. Poland is also working on that issue within the framework of our national laws as out of 300 estimated wrecks in Baltic Sea around 100 is located in Polish waters. The most hazardous are from the World War II period, like s/s Stuttgart and t/s Franken. Stuttgart has already produced fuel leaks. Franken is at advanced corrosive state and may collapse anytime. On top of that there are numerous wrecks carrying the deposits of chemical weapons. The estimates are that the release of only the sixth part of those deposits would create a mass-scale catastrophe that would seize the life in Baltic Sea for a century. The costs of removing all hazardous deposits from the Baltic Sea are enormous. Polish Ministry of Maritime Economy and Inland Navigation strongly believes that those cost could be distributed amongst all Baltic Sea States.

13.1.9 Germany - Statement by the state of Schleswig-Holstein

In 2019, Progress has been made in terms of the description of the effects of munition dumped in the ocean based on the previously presented results of the scientific projects DAIMON (INTERREG-Baltic Sea, see <https://www.daimonproject.com>) and UDEMM (sponsored by the Federal Ministry for Education and Research, see <https://udemmm.geomar.de>). The approach of the INTERREG Baltic Sea project DAIMON, integrating the results of previous projects (MERCW, CHEMSEA, MODUM) and the methodological findings on eco-toxicological assessment from the UDEMM project have provided the scientific basis for this. The now available evidence of toxic substances from weapons in seawater, sediment and also in marine organisms is still based on extremely low concentrations due to the corrosion that has begun. However, it is a serious warning signal due to progressive rusting processes. Therefore, the results do not yet justify immediate action. The consortium of the project “Robotic Underwater Salvage and Disposal Procedure including Technology for the Delaboration of Ammunition in the Sea” (RoBEMM) presented its work at the status meeting “Maritime Technologies-2018” as a technical breakthrough. A system based on the results of this study should make it possible to eliminate large, unmanageable maritime explosive devices without underwater blasting in the future. Since 2003, approx. 25 million Euro subsidies were applied to maintain this situation. Due to media coverage on television and in print media as well as the annual reporting of the Expert Group on Ammunition in the Sea of the federal/state working group North and Baltic Sea (<https://www.munition-im-meer.de>), the results will be made available to an interested public. Currently, the HELCOM work group SUBMERGED is collating the findings regarding the contamination of the entire Baltic Sea with munition, ship and military plane wrecks. With this process, a recommendation of the authors of the HELCOM report regarding chemical weapons in the Baltic Sea (see <http://www.helcom.f1/Lists/Publications/BSEP142.pdf>) is being implemented. Publication is envisaged in late 2020. For a further two years, work will continue in the Interreg North Sea Project “North Sea-Wrecks” under the guidance of the Deutsches Schifffahrtsmuseums (German Shipping Industry Museum) to transfer methods from UDEMM and DAIMON to the situation in the North Sea. The objective is to clarify which risks can emanate from war ship wrecks with particularly poisonous fuels and munition. The new methods are practically unlocked for the neighbouring countries by way of regional conferences and internships of the project DAIMON 2 and the decision support systems DIAMON-DSS is transferred to an operatively effective status. In addition, the European Fisheries Fund promotes the projects BASTA and ExPloTect to continue to close already identified technical-methodical gaps. Schleswig-Holstein Page 135 87 Schleswig-Holstein State Parliament - 19th Election Period Printed matter 19/2046 Future project applications will primarily deal with the issue as to whether and how the chemical compound of weapons in marine organisms can impact food from the sea. The recent decisions of the expert minister conferences for the environment as well as internal affairs can be

considered the first national strategies. Both exhibit the willingness to collaborate and provide partially extremely specific measures, but also account for the results available so far by first raising systematic data to focus on the correct situation with suitable measures. The resolutions were preceded by different parliamentary deliberations in the State Parliaments of Mecklenburg-Vorpommern and Schleswig-Holstein as well as minor enquires to the Federal Government by the parties of the German Bundestag.

13.1.10 Sweden

Sweden has presently no planned measures regarding deposited ammunitions. The Swedish armed forces provide support when unexploded ordinance is detected, and the Swedish defence research agency provide advice and support regarding chemical munitions. The Baltic Sea and Skagerrak contains a dark legacy of ca. 250 000 tons of dumped munitions. The DAIMON project, have assessed the risk. The group is preparing the report on environmental threats posed by wrecks and dumped munitions.

13.2 MUNITECT network position paper

<https://igd-r.de/munitectpaper>

13.3 AMUCAD Presentation

https://www.amucad.org/about/amucad_functionalities_and_projects.pdf

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