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| **MONITORING FACT SHEET** | |
| **Title: Monitoring programme D11 – Underwater Noise** | |
| **1. General** | |
| **1.1 Subject area** | *What is monitored – programme ID (BLKXX-DY)*  *Programme name*: Monitoring programme on D11 - Underwater Noise  *Programme ID*: BLKBG\_D11\_UnderwaterNoise |
| **1.2 Definition/Description** | *Definition of items monitored/description of general approach*  The lack of sufficient data and information, the initial assessment of Bulgarian marine waters published in June 2013, was unable provide an assessment for achieving the GES in relation to underwater noise and its impacts, as well as to provide adequate basic and threshold values. Bulgaria has taken steps to conduct studies to provide the necessary data to formulate GES and formulation of indicators and targets. Only then can develop a program for monitoring underwater noise, which will provide the necessary information relating to the implementation of the MSFD.  Program for monitoring underwater noise will focus on providing data on the distribution and levels of noise in the marine environment and related human activities and basic measuring the impact of noise on marine organisms. Developing a "Noise register" will allow determining the general spatial and temporal scale of distribution of impulsive (variables) noise sources and the establishment of baseline (baseline) the current state of the medium.  Human activities are the source of pulse (temporary) and / or constant noise will be recorded by the register (indicator 11.1.1), in accordance with EC Decision 2010/477 / EC and the "Guide for monitoring underwater noise in Europe seas under MSFD "to provide information that adversely affect marine organisms (fish and mammals). Register noise monitoring will provide monitoring data and information for planning of measures to reduce / prevent negative impact on the marine environment. |
| **1.3 Competent authority/ies** | *Which authorities are responsible (links to www)*  **Ministry of Environment and Waters (МоEW)**  According to Art. 151, para. 1, p. 2k) of the Water Act and Art.101, para. 1 of Regulation № 1 / 11.04.2011 for monitoring of waters, the Minister of Environment and Waters organizes and manages water monitoring. According to Art. 3, para. 3, point 8 of the Regulation on the protection of the environment in marine waters (NOOSMV), the Minister of Environment and Waters approves the monitoring programs under Art. 11 and coordinates their development and implementation.  **URL:** <www.moew.government.bg>  **Black Sea Basin Directorate - Varna (BSBD - Varna) to the Ministry of Environment and Waters (МоEW)**  According to Art. 155, paragraph 4b) of the Water Act and Art. 107, para. 1 of Regulation № 1 / 11.04.2011 for monitoring of waters, the Director of the BSBD - Varna plans and participates in the implementation of water monitoring, summarizes and analyses data, including that for the chemical and ecological status of water. According to Art. 3, para. 4, point 4 of the Regulation on the protection of the environment in marine waters (NOOSMV), the Director of the Black sea basin Directorate plans, develops and coordinates the monitoring programs under Art. 11.  **URL**: <http://www.bsbd.org/> |
| **1.4 Monitoring institutions** | *Which institutions carry out the monitoring etc. (links to web page)*  **Monitoring of marine waters** – **Institute of Oceanology, Bulgarian Academy of Sciences (IO-BAS)**.  Its responsibilities are defined in Art. 171, para. 2, point 3 of the Water Act and Art. 3, paragraph 11 of the Regulation on the protection of the environment in marine waters, approved by Decree № 273 from 23.11.2010, Prom. SG № 94 dated 30.11.2010, effective from 30.11.2010.  **URL**: [www.io-bas.bg](http://www.io-bas.bg) |
| **1.5 Additional information** | *Where can additional information be found (e.g. via a web link)*  MSFD Technical guidance underwater noise in European seas  <http://publications.jrc.ec.europa.eu/repository/bitstream/JRC88045/lb-na-26555-en-n.pdf>  Impact Assessment Environmental and Social (ESIA) for the gas pipeline project "South Stream" (in part ESIA impact of underwater noise)  <http://www.south-stream-offshore.com/media/documents/pdf/en/2013/12/ssttbv_appropriate-assessment-appendix-4-modeling_en_20131216.pdf>  MSFD Guiding Improvements in the Black Sea Integrated Monitoring System (MISIS) project  <http://www.misisproject.eu>  Technical and administrative support for joint implementation of MSFD in Bulgaria and Romania  <http://www.msfdblacksea.eu> |
| **2. Monitoring requirements and purpose** | |
| **2.1 Necessity** | *Listed below are direct references to the monitoring requirements – EU directives, Black Sea Commission agreements, national plans, research programme requirements, other.*  *Delete/add rows* |
| **Marine strategy framework directive MSFD**  **Art. 11 Annex III** | *Comments*  Marine strategy framework directive MSFD  Art. 11 Monitoring programs   1. On the basis of the initial assessment made pursuant to Article 8(1), Member States shall establish and implement coordinated monitoring programmes for the ongoing assessment of the environmental status of their marine waters on the basis of the indicative lists of elements set out in Annex III and the list set out in Annex V, and by reference to the environmental targets established pursuant to Article 10. 2. Member States sharing a marine region or subregion shall draw up monitoring programmes in accordance with paragraph 1 and shall, in the interest of coherence and coordination, endeavour to ensure that:   (a) monitoring methods are consistent across the marine region or subregion so as to facilitate comparability of monitoring results;  (b) relevant transboundary impacts and transboundary features are taken into account.  Annex III, Table II: Pressures and impacts underwater noise (ex. from shipping, underwater acoustic equipment). |
| **Habitat Directive**  **Article 11** | *Comments*  **Habitats Directive (Council Directive 92/43/EEC)**  Art. 11 Member States shall undertake surveillance of the conservation status of those referred to in Article 2 natural habitats and species, with particular regard to priority natural habitat types and priority species. |
| **Environmental Impact Assessment Directive (EIA)**  **Article 3** | *Comments*  Art. 3  The environmental impact assessment shall identify, describe and assess in an appropriate manner, in the light of each individual case and in accordance with Articles 4 to 12, the direct and indirect effects of a project on the following factors:  (a) human beings, fauna and flora; |
| **Convention for the Protection of the Black Sea Against Pollution**  **Strategic Action Plan for the Black Sea in 2009** | *Comments*  Convention for the Protection of the Black Sea Against Pollution  **Art. XV** (1) The Contracting Parties shall cooperate in conducting scientific research aimed at protecting and preserving the marine environment of the Black Sea and shall undertake, where appropriate, joint programmes of scientific research, and exchange relevant scientific data and information.  (4) The Contracting Parties shall, inter alia, establish through the Commission and, where appropriate, in cooperation with international organizations they consider to be competent, complementary or joint monitoring programmes covering all sources of pollution and shall establish a pollution monitoring system for the Black Sea including, as appropriate, programmes as bilateral or multilateral level for observing, measuring, evaluating and analyzing the risks or effects of pollution of the marine environment of the Black Sea.  **BSIMAP** - Black Sea Integrated Monitoring and Assessment Programme  **URL:** <http://www.blacksea-commission.org/_bsimap_description.asp> |
| **2.2 GES criteria** | *Li*st *relevant GES Criteria and characteristics [indicators]* (see *Commission Decision of 1. September 2010)*  11.1. Distribution in time and place of loud, low and mid frequency impulsive sounds  – Proportion of days and their distribution within a calendar year over areas of a determined surface, as well as their spatial distribution, in which anthropogenic sound sources exceed levels that are likely to entail significant impact on marine animals measured as Sound Exposure Level (in dB re 1μPa 2 .s) or as peak sound pressure level (in dB re 1μPa peak ) at one meter, measured over the frequency band 10 Hz to 10 kHz (11.1.1).  11.2. Continuous low frequency sound  – Trends in the ambient noise level within the 1/3 octave bands 63 and 125 Hz (centre frequency) (re 1μΡa RMS; average noise level in these octave bands over a year) measured by observation stations and/or with the use of models if appropriate (11.2.1). |
| **2.3 Features, pressures and impacts** | *List relevant features and pressures from MSFD Annex III*  Underwater noise (e.g. from shipping, underwater acoustic equipment).  *Refer to section 6 regarding gaps and plans* |
| **2.4 GES** | *Assessment of GES (GES as defined in the article 9 reporting)*  Due to the significant lack of data and knowledge on the effects of underwater noise in the marine environment, at this stage there is no definition for GES. Actions planned to overcome the deficiencies referred to in Section 6.  Program actually does not address natural and climatic variability, given that it is aimed at pressure, respectively impact entirely anthropogenic origin. |
| **2.5 Environmental targets**  **Marine Strategy Framework Directive (Directive 2008/56/EC)** | *Relevant MSFD targets defined in the article 10 reporting*  *State relevant targets from other obligations (see section 2.1) that are addressed by the monitoring*  At this stage it is impossible to be defined targets (see. Section 2.4.). This can be done after conducting specialized surveys to fill the significant gaps in knowledge.  In the Strategic Plan of Action for the Protection of the Black Sea against Pollution there are no targets set for underwater noise. |
| **2.6 Spatial allocation** | *Table of where monitoring is required*   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | EEZ | 12-mile zone | Coastal waters | Transitional waters | | MSFD | x | x | x | - | | HD | x | x | x | x | | BSIMAP | x | x | x | - | |
| **3 Monitoring concept** | |
| **3.1 General description of relevant subprogrammes in monitoring programme** | *List subprogrammes monitored under this programme (only general description)*  **Acute underwater noise - distribution, frequency and levels**  Elements/features monitored: Level of pressure in marine environment/Noise  Parameters: Intensity and temporal frequency of underwater noise; number of days  **Diffuse underwater noise - distribution, frequency and levels**  Elements/features monitored: Level of pressure in marine environment/Noise  Parameters: Intensity and temporal frequency of underwater noise  **Activities extracting non-living resources (dredging**)  Elements/features monitored: Activity/Extraction of non-living resources (dredging)  Parameters: Distribution/extent in space and time, intensity  **Activities with permanent infrastructures (e.g. ports) or structural changes (e.g. coastal defences)**  Elements/features monitored: Activity/ Man-made structures (incl. construction phase)  Parameters: Distribution/extent in space and time, intensity  **Sea-based mobile activities (shipping, boating)**  Elements/features monitored: Activity/Transport; Recreation; Research and surveys  Parameters: Distribution/extent in space and time, intensity  **Effectiveness of measures**  Elements/features monitored: Measures/Existing measures  Parameters: will be developed additionally |
| **3.2 Description of monitoring network** | *Description + maps (describing the spatial resolution of the entire programme)*  Specific observation points for this program will be determined after conducting specialized surveys to fill significant gaps in knowledge. The main areas of inspection to be in the areas with the most intense ship traffic and against the larger resorts.  For background noise measurements will be carried out in places that are far away from shipping lanes and other sources of anthropogenic noise. |
| **3.3 Threats, activities and measures** | *Which threats are identified*  Anthropogenic noise has potentially negative consequences for adaptability and experience of various marine species. Marine mammals (cetaceans) are one of the most sensitive groups because they have highly developed auditory system and use sound actively feeding and communication.  *Which human activities will be measured by the programme*   * Dredging * Submarine cable and pipeline operations * Setting and operation of temporary and / or permanent structures in the offshore (other than for energy production) * Activities on the coast - recreational sports * Shipping   Measures will be monitored for the program will be developed.  *Which measures will be measured by the programme* |
| **3.4 Data management** | *How and where are data managed? How and where can data be accessed? (General description – programme level)*  No data on underwater noise, which are publicly available. During the period 2015 - 2016, we expect to develop new modules to the Water Information System in Bulgaria. One of the planned modules will include data and information on the implementation of the MSFD, including for underwater noise. |
| **4. Assessment** | |
| **4.1 Assessments** | *Existing assessments*  *Provide information about or URL links to existing assessments (e.g. Initial Assessment)*  Underwater noise has not been addressed in the Bulgarian report under Article 8, 9 and 10 of MSFD. Partial information is now available in the assessment of environmental impact on the South Stream project (South Stream, URL: <http://www.south-stream-offshore.com/media/documents/>). The report provides threshold values for impulse and background noise modelling of sound distribution in the marine environment and analysis of the noise impact of single and repeated exposure during the various project activities. |
| **4.2 Assessment of GES** | *Will assessment of GES be carried out by the programme*  Monitoring of underwater noise to provide an assessment of GES / distance from GES will be available after the planned study to remedy the lack of information and monitoring data that will enable the development of indicators and accordingly define targets. |
| **5. Literature** | |
|  | *List of relevant literature*  Nikolaos, Z., Andreas, P., Anja, Duffek., Jaap, Graveland., Giordano, Giorgi, Claus, Hagebro., & Wanda, Zevenboom (2014)Technical guidance on monitoring for the Marine Stategy Framework Directive Publications Office of the European Union.  Van der Graaf, A. J., Ainslie, M. A., André, M., Brensing, K., Dalen, J., Dekeling, R. P. A., Robinson, S., Tasker, M. L., Thomsen, F., Werner, S., “European Marine Strategy Framework Directive - Good Environmental Status (MSFD GES): Report of the Technical Subgroup on Underwater noise and other forms of energy”, 2012. online: [http://ec.europa.eu/environment/marine/pdf/MSFD\_reportTSG\_Noise.pdf](http://ec.europa.eu/environment/marine/pdf/MSFD_reportTSG_Noise.pdf%20)  Zampoukas, N., H. Piha, 2011. Review of Methodological Standards Related to the Marine Strategy Framework Directive Criteria on Good Environmental Status. Publications Office of the European Union, 53 pp. URL: <http://publications.jrc.ec.europa.eu/repository/handle/111111111/16069>  Zampoukas, N., H. Piha, E. Bigagli, N. Hoepffner, G. Hanke, A. Cardoso, 2012. Monitoring for the Marine Strategy Framework Directive: Requirements and Options. Publications Office of the European Union, 42 pp. URL: <http://publications.jrc.ec.europa.eu/repository/handle/111111111/23169>  South Stream Environmental Impact Assessment. Annex 9.8.1: Impact assessment of the underwater noise during the construction and exploitation of the "South Stream" pipeline in the Bulgarian sector of the Black Sea. Site: <http://www.south-stream-offshore.com/media/documents/pdf/en/2013/11/ssttbv_tom-8-3_en_20131118.pdf>, Retrieved: 30.6.2014. |
| **6. Activities required to implement the concept** | |
| **6.1 Changes to the current monitoring programme** | *Necessary changes and recommendations*  *Describe necessary changes for the programme to cover the requirements of MSFD. Description in general terms.*   * Lack of data on underwater noise and the noise impact caused by human activities in the Bulgarian waters of the Black Sea region is necessary specialized research to fill significant gaps and can help to developing GES of definitions, indicators and targets; * Better coordination with other institutions / organizations providing information related to the status or impact on the marine environment; * Provide sufficient capacity to the competent authorities and organizations (human resources, expertise and equipment) for the design and monitoring of the marine environment; * Improve the management of data and information relating to the state of the marine environment; improve access to national and regional databases and data from projects funded by the EC and other financial instruments; * Needed by Bulgaria and Romania to review and develop together agreed objectives based on consistent, if not harmonized indicators for their marine waters, taking into account the assessment and recommendations of the Commission. |
| **6.2 Gaps: GES information** | *If not yet adequate for data and information needs to assess GES, describe when the programme will be considered fully adequate*  The program will provide for the assessment of GES information for the next assessment in 2018 |
| **6.3 Plans: Plans for GES information** | *If the programme is not considered fully adequate for data and information needs to assess GES, describe what plans are in place to make it fully adequate (e.g. to fill gaps in data methods, understanding or capacity). Describe timeframe, priorities and obstacles.*  In the period 2015-2016, it is planned study of underwater noise, including the following activities: 1. Study of existing methodologies and practices in relation to the development and implementation of programs for monitoring underwater noise under the MSFD. 2. Collection of data on the main sources of anthropogenic noise in the test water area. 3. Description of the characteristics of potential sources of anthropogenic noise. 4. Conducting pilot measurements of the background noise level in areas with high and low intensity of shipping in the survey area by stationary systems hydrophones. 5. Analysis and interpretation of the results of acoustic measurements. 6. Assessment of noise levels and spatial distribution of different types of ships.  7. Modelling of background noise using AIS monitoring data, measurements and estimates of levels and spatial distribution of noise from different types of ships in order to create maps of the spatial distribution of noise levels.  8. Purchase of equipment which will be used in future activities related to measurements of noise in the marine environment.  Synchronized with studies of underwater noise will be realized and study to fill the gaps of monitoring data on marine mammals, including the impact of noise pollution in the marine environment. After filling the gaps and improving the program for monitoring Descriptors 11 - Underwater noise and energy will start in 2017.  The results of the studies will be shared with Romania to ensure greater coherence in subsequent implementation of the MSFD, and also with other Black Sea countries in the Black Sea Commission. Actions have been taken to increase the capacity of the Basin Directorate for Black Sea region in connection with commitments on the implementation of the MSFD, including planning of monitoring programs, the programs of measures, etc.  In the period 2015 - 2016 were expecting the development of new modules to the Water Information System for in Bulgaria. One of the planned modules will include data and information on the implementation of the MSFD, including programs and subprograms for monitoring data from the monitoring, monitoring data to achieve the GES, targets, indicators of individual descriptors measures and their implementation and others.  Improve coordination with other institutions / organizations providing information relating to the status or impact on the marine environment. |
| **6.4 Gaps: Target information** | *If not yet adequate for data and information needs to assess targets, describe when the programme will be considered fully adequate*  It is anticipated that the program will provide the necessary information for the purposes of GES for the next assessment in 2018 |
| **6.5 Plans: Plans for information on targets** | *If the programme is not considered fully adequate for data and information needs to assess targets, describe what plans are in place to make it fully adequate (e.g. to fill gaps in data methods or capacity). Describe timeframe, priorities and obstacles.*  Described in Section 6.3. (Plans to provide information for GES) planned study is expected to provide information on the development of indicators and define targets for GES. The results will be shared with Romania, to ensure greater coherence in subsequent implementation of the MSFD, and also within the Commission for Protection of the Black Sea against Pollution. |
| **6.5 Plans: Plans for information on measures** | *If relevant: If the programme is not considered fully adequate for data and information needs to assess measures describe what plans are in place to make it fully adequate (e.g. to fill gaps in data methods or capacity). Describe timeframe, priorities and obstacles.*  Studies in 2015 will support the further development of guidelines for measures to reduce the impact of underwater noise. |