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| **MONITORING FACT SHEET** | |  |
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| **MONITORING FACT SHEET TEMPLATE** | | **This column is for information only and should be removed when the sheet has been filled in.** |
| **Title: Monitoring programme D11 – Underwater Noise** | |  |
| **1. General** | | **Reporting sheet questions (ref. DIKE\_9-2014-03 for additional guidance on questions) and comments on template suggestions presented below** |
| 1.1 Subject area | *What is monitored – programme ID (BLKXX-DY)*  Programme name: D11 – Underwater Noise  Programme ID: BLKBG-D11-Underwater Noise | Q4: Programme name (4d); Programme ID (exchange XX with BG or RO; exchange Y with relevant descriptor no.) (4e) |
| 1.2 Definition/Description | *Definition of items monitored/description of general approach*  Underwater noise can have significant negative impact on marine animals and their communities. The initial assessment of the Bulgarian marine waters, published in June 2013, was not able to provide assessment of the underwater noise and its impacts, and was not able to provide adequate baseline and threshold values. Underwater noise by human activities (pile driving, seismic surveys, naval sonars) can have different impact on the different marine animals. Low-frequency noise can cause communication difficulties in marine mammals. High-frequency impulsive noise from pile driving or active seismic vessels repels marine mammals. Fish respond to impulsive sounds at short range. In summary, noise can cause two main adverse effects: gaps in distribution caused by impulsive sounds and communication difficulties, caused by low frequency noise.  The monitoring programme on underwater noise will focus on the driving forces (international maritime trade, economic development), pressures (shipping, dredging, pile-driving), state of the marine environment (noise levels) and impact (animal distribution in relation to the major sources of noise, e.g. shipping routes) resulting from underwater noise within the [DPSIR framework](http://root-devel.ew.eea.europa.eu/ia2dec/knowledge_base/Frameworks/doc101182). The impact will be measured according to the values set in the relevant indicators under Descriptor 11. | Q4: Programme description (4f). Free text or URL link. What is monitored by the programme (state/impact, pressure, activities, measures) and why. How does it adapt to new and emerging environmental problems |
| 1.3 Competent authority/ies | *Which authorities are responsible (links to www)*  **Ministry of Environment and Waters (MOEW)**  **Web:** <www.moew.government.bg>  **Black Sea Basin Directorate, Varna (BSBD)**  **Web**: <http://www.bsbd.org/> | Q4: Responsible Competent Authority (4a)  If more than one – put contact to the EU Commission |
| 1.4 Monitoring institutions | *Which institutions carry out the monitoring etc (links to www)*  **Monitoring of sea waters** ‑ Institute of Oceanology, Bulgarian Academy of Sciences (IO-BAS). Web: [www.io-bas.bg](http://www.io-bas.bg). Relationship between MOEW (BSBD) and IO-BAS relationship is contract-based. | Q4: Responsible institutions; relationship to Competent Authority (4b) +(4c) |
| 1.5 Additional information | *Where can additional information be found (e.g. via a web link)*  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  No link available yet  *Regarding regional coordination remember this project and other relevant joined projects* | Q3: Additional information on: Regional coordination; consideration of transboundary impacts; ability of programme to identify major changes in environment and new and emerging issues; (3a-c) |
| 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* | The purpose of this section is to give an overview of existing monitoring requirements related to this programme and to help coordinate already existing monitoring  Q8a: Existing monitoring programmes deliver data to other directives etc. This part of the monitoring fact sheet helps to give an overview of how and where the specific monitoring is used for many purposes/requirements (8a).  State where relevant monitoring is already carried out (or should be/is required) |
| MSFD  Article 11  Article 8  Annexe III | *Comments*  Marine Strategy Framework Directive (Directive 2008/56/EC).  **Article 11**  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.  **in Annex III, Table II:**  The following pressures and impacts shall be monitored: Underwater noise (e.g. from shipping, underwater acoustic equipment). | Which parts of MSFD requirements does the programme fulfil? Refer to the articles and annexes of the Directive that require that monitoring is carried out. |
| Habitat Directive  Article 11 | *Comments*  **Habitats Directive (Council Directive 92/43/EEC)**  The HD purpose is conservation means a series of measures required to maintain or restore the natural habitats and the populations of species of wild fauna and flora at a favourable status. Underwater noise can negatively impact the marine animals. | Which parts of HD requirements does the programme fulfil? |
| Black Sea Commission  Black Sea SAP | *Comments*  Convention on the Protection of the Black Sea Against Pollution  Art. 15.  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 analysing the risks or effects of pollution of the marine environment of the Black Sea. | Does the programme fulfil any formal obligations to the BSC? |
| 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 metre, 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). | Which GES criteria are addressed/monitored by the programme (5a). Select the relevant criteria  Which characteristics [indicators] are addressed/monitored (5b) |
| 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* | Which elements of Annex III (ecosystem components, pressures/impacts) are addressed/monitored by the programme (5c) |
| 2.4 GES | *Assessment of GES (GES as defined in the article 9 reporting)*  GES definition on indicator 11.1.1. Human activities introducing loud, low and mid frequency impulsive sounds into the marine environment are managed to the extent that no significant long term adverse effects are incurred at the population level or specifically to vulnerable/threatened species and key functional groups (relevant UK GES definition).  GES definition on indicator 11.1.2. Continuous low frequency sound inputs do not pose a significant risk to marine life at the population level, or specifically to vulnerable/threatened species and key functional groups e.g. through the masking of biologically significant sounds and behavioural reactions (relevant UK GES definition). | State the definition of GES reported for the relevant descriptor and describe how the programme: addresses assessment needs for the relevant descriptor; contributes to determining distance from GES and trends in status; addresses natural and climatic variability; responds to risk of not achieving GES (5f) |
| 2.5 Environmental targets  MSFD  HD  BD  WFD  BSC | *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*  **Marine Strategy Framework Directive**  11.1.1 Target: To establish a “noise registry” to record, assess, and manage the distribution and timing of anthropogenic sound sources measured over the frequency band 10 Hz to 10 kHz, exceeding the energy source level 183 dB re 1 μPa² m² s; or the zero to peak source level of 224 dB re 1 μPa² m² over the entire area of the Bulgarian marine waters.  11.1.2 Target: Surveillance indicator to monitor trends in the ambient noise level within the 1/3 octave bands 63 and 125 Hz (centre frequency) (re 1μPa RMS; average noise level in these octave bands over a year) measured by observation stations.  **Habitats Directive**  Ensuring bio-diversity through the conservation of natural habitats and of wild fauna and flora in the European territory of the Member States to which the Treaty applies. | Q6: State the targets addressed by the monitoring.  Which reported targets are addressed (6a)?  Will the programme provide adequate data to assess progress towards achievement of target and will the collected data enable updating of targets (6b-c)?  Explain how the programme will contribute to the assessment of progress with targets (6d)  Add targets relevant to other directives and commitments |
| 2.6 Spatial allocation | *Table of where monitoring is required*   |  |  |  |  |  | | --- | --- | --- | --- | --- | |  | EEZ | 12-nm zone | Coastal waters | Transitional waters | | MSFD | x | x | x | - | | HD | x | x | x | x | | Q4: Geographical coverage by reference to the 4 zones in table 1 of the "concept paper" (4i) |
| **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  Diffuse underwater noise - distribution, frequency and levels | Use list In document DIKE\_9-2014-03\_Art11ReportingPackage.doc and BS-CBE Jan\_MFS Pgm Subpgm\_list\_rev.xls for subprogramme names. New ones may be added if necessary. Use BS-CBE Jan\_MFS Pgm Subpgm\_list\_rev.xls to see/check parameters measured in subprogramme |
| 3.2 Description of monitoring network | *Description + maps (describing the spatial resolution of the entire programme)*  In Bulgaria, there is no monitoring network established for underwater noise.  For acute sounds, like pile diving and dredging, a regulation requiring the investor to record the impulsive sounds by using a hydrophone is a practical solution for plans for gathering monitoring data. Similar approach can be applied for monitoring of ambient noise. | Spatial resolution (density op sampling). Show sampling network on map. Describe the rationale for the geographical scope of the programme ("4j") |
| 3.3 Threats, activities and measures | *Which threats are identified*  Deterioration of the populations of marine animals due to changes in communication, behaviour, spatial distribution and death of marine animals.  *Which human activities will be measured by the programme*   * Marine hydrocarbon extraction (oil and gas) * Dredging * Submarine cable and pipeline operations * Oil and gas * Placement and operation of offshore structures (other than for energy production) * Marine research, survey and educational activities * Shipping   Describe the nature of activity or pressure (7b)   * Marine hydrocarbon extraction (oil and gas) * Dredging * Submarine cable and pipeline operations * Oil and gas * Placement and operation of offshore structures (other than for energy production) * Marine research, survey and educational activities * Shipping   *Which measures will be measured by the programme* | Q7: Relevant activities (7a); describe the nature of activity or pressure (7b); relevant existing measures (if any) (7c); how are existing measures monitored (7d) |
| 3.4 Data management | *How and where are data managed? How and where can data be accessed? (General description – programme level)* | Q10 (+Q3): Access to data; use rights; INSPIRE standards; when will data become available; updates when; how will data be made available to the EEA |
| **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 MSFD Article 8, 9 and 10 reporting. Relevant information is currently available under the Environmental Assessment Impact South Stream Project (<http://www.south-stream-offshore.com/media/documents/>, retrieved 30.6.2014. The report gives noise thresholds for acute and ambient noise, modelling of noise distribution in the marine environment and analysis of noise impact from single and multiple exposures during different project activities. | This is for information purpose only. Where can stakeholders etc find existing assessments on issues relevant to the programme |
| 4.2 Assessment of GES | *Will assessment of GES be carried out by the programme*  There is no existing monitoring programme for assessment of the environmental status on Descriptor 11 and the distance from GES. The programme will be adequate if designed in accordance with the MSFD requirements. Refer to Section 6 for plans to make the programme adequate. | Q5: Will the programme enable periodic assessment of environmental status and distance to and progress towards GES (5d). Describe how and refer to section 6 to describe if programme is not considered fully adequate. |
| **5. Literature** | |  |
|  | *List of relevant literature*  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. Web: <http://publications.jrc.ec.europa.eu/repository/handle/111111111/16069>  Zampoukas, N., A. Palialexis, A. Duffek, J. Graveland, G. Giorgi, C. Hagebro, G. Hanke, S. Korpinen, M. Tasker, V. Tornero, V. Abaza, P. Battaglia, M. Caparis, R. Dekeling, M. Frias Vega, M. Haarich, S. Katsanevakis, H. Klein, W. Krzyminski, M. Laamanen, J.C. Le Gac, J.M. Leppanen, U. Lips, T. Maes, E. Magaletti, S. Malcolm, J.M. Marques, O. Mihail, R. Moxon, C. O'Brien, P. Panagiotidis, M. Penna, C. Piroddi, W.N. Probst, S. Raicevich, B. Trabucco, L. Tunesi, S. van der Graaf, A. Weiss, A.S. Wernersson, W. Zevenboom, 2014. Technical guidance on monitoring for the Marine Strategy Framework Directive. Joint Research Centre – Institute for Environment and Sustainability. 166 p.  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. Web: <http://publications.jrc.ec.europa.eu/repository/handle/111111111/23169>  ANSI S12.7-1986, “Methods for measurement of impulse noise”, Issued by the American National Standards Institute, 20, February 1986  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.* | Which changes are necessary to the current/existing monitoring programme to secure adequacy with regards to MSFD (e.g. changes in monitoring network)  Q7: Will the programme provide necessary data and information to enable identification of relevant activities/pressures that are causing environmental degradation and will the programme identify suitable new measures and the effectiveness of existing measures (7e) |
| 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* | Select when the programme is expected to be adequate: In 2014; in time for next assessment in 2018; in time for updating of monitoring programme in 2020; later than 2020 (5g) |
| 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.*  **General recommendations:**  **Spatial scope of the monitoring programme**. Expand the current monitoring network to provide data for the pressure from the drivers (human activities and natural changes), state and impact in the coastal waters, territorial waters and exclusive economic zone, according to the requirements of the Marine Strategy Framework Directive.  **Design a monitoring programme in line with MSFD**. To design an adequate monitoring programme, the requirements of the “Technical guidance on monitoring for the Marine Strategy Framework Directive” (Zampoukas et al., 2014) should be taken into account.  **Programme-specific requirements**  Start in 2015 (if not already started in 2014) the implementation of coordinated with Romania a pilot monitoring programme on Descriptor D11 – Underwater noise, to provide information on the distance from GES and update the GES definition, if necessary, for the next Article 8 reporting on assessment of environmental status and Article 9 reporting on GES in 2018.  **Bulgaria and Romania should revise and further develop together** coherent GES definitions and assessment methods for their marine waters, taking into account the assessment and the recommendations of the Commission, as much as possible, in 2014.  **Creating a noise register**. Passing a national regulation requiring the maritime industry to record impulsive sounds and provide those data. The Bulgarian competent authorities will create a noise register for recording present and future under water noise levels for information on GES on Descriptor 11, indicator 11.1.1.  **Bulgaria and Romania should revise and further develop together coherent targets** based on agreed, if not harmonized, indicators for their marine waters, taking into account the assessment and the recommendations of the Commission, as much as possible, in 2014.  **Bulgaria and Romania should develop together agreed indicators** (based on common parameters) and/or **harmonised indicators** (based on common parameters and common methods) for their marine waters, taking into account the assessment and the recommendations of the Commission, as much as possible, in 2014.  **Using consistent sampling and assessment methodologies across Member States (Bulgaria and Romania)**.  **Take advantage in 2015 (if not already taken in 2014) of the available co-funding opportunities (LIFE, Horizon 2020, EMFF) and/or International Financial Institutions (European Bank for Reconstruction and Development (EBRD), European Investment Bank (EIB), The World bank (WB)), if necessary to fulfil the requirements of the MSFD**. Spatial scope and the monitoring requirements pose significant burden to the national budgets of all the EU countries. Therefore, both Bulgaria and Romania should advantage of the relevant EU funds to support the implementation of the MSFD. | Free text or URL link to relevant information (5h) |
| 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* | Select when the programme is expected to be adequate: In 2014; in time for next assessment in 2018; in time for updating of monitoring programme in 2020; later than 2020 (6e) |
| 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.*  Start in 2015 (if not already started in 2014) the implementation of coordinated with Romania monitoring programme on Descriptor D11 Hydrography, to provide information on the GES targets and update the targets, if necessary, for the next GES Article 9 reporting in 2018,  **Bulgaria and Romania should revise and further develop together coherent targets** based on agreed, if not harmonized, indicators for their marine waters, taking into account the assessment and the recommendations of the Commission, as much as possible, in 2014.  **Creating a noise register**. Passing a national regulation requiring the maritime industry to record impulsive sounds and provide those data. The Bulgarian competent authorities will create a noise register for recording present and future under water noise levels for information on GES targets on Descriptor 11, indicator 11.1.1. | Free text or URL link to relevant information (6f) |
| 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.* | Free text or URL link to relevant information (7f) |