Factsheet for new measures under Article 13 of Marine Strategy Framework Directive 2008/56/EO

This measure fact sheet is the result of coordination between the UBA project Implementation of the Marine Strategy Framework Directive (MSFD) in Bulgaria – Development of Programmes of Measures under Article 13', carried out by Fresh Thoughts/Intersus, and the EC project (DG Environment) 'Technical and administrative support for the joint implementation of the Marine Strategy Framework Directive (MSFD) in Bulgaria and Romania – Phase 2', carried out by ARCADIS-Belgium.

Measure characteristics	**Management area:** - ***Black Sea***	**Code:** ***BLKBG*** **№ of measure: 15**
Measure title	**Creating coherent and representative networks of marine protected areas that includes MPA's in both RO and BG, including management plans. Enhanced control of regulated activities within MPAs**	
Short, precise description of the measure	This measure complements the measure № 14 on the preparation / updating the management plans of protected areas, including marine area, taking into account the requirements of the Framework Marine Strategy Directive 2008/56 / EC.	
EU measure category	**2a**	
Key Types of Measures	*KTMs as defined in the „PoM Recommendations". Measures can be categorised in one or multiple KTMs.* **KTM 37 Measures to restore and conserve marine ecosystems, including habitats** **Other relevant KTM under Directive WFD 2000/60/EC:** KTM 14 Research, improvement of knowledge base reducing uncertainty KTM 19 Measures to prevent or control the adverse impacts of recreation including angling KTM 20 Measures to prevent or control the adverse impacts of fishing and other exploitation/removal of animal and plants	
Environmental targets	*Categorisation of the measures in accordance with the nationally defined operational environmental objectives.* **Descriptors 1,4,6** **Targets according to Art. 10 of the MSFD** **1.1.1, 1.1.2, 1.1.3 Target: Maintain or increase the distribution range (and pattern within the latter) of the typical zoobenthos and phytobenthos species in the MSFD predominant habitat types, relevant habitats under the Habitats directive and the associated national biotopes, according to the Bulgarian report under Art. 10 of the MSFD:**	

	• Chthamalus stellatus (MSFD: Mediolittoral rocks. Habitats Directive: 1170; National biotope: Upper mediolittoral with Chthamalus stellatus, Melaraphe neritoides и Ligia italica) • Donacilla cornea (MSFD: Mediolittoral sediments. Habitats Directive: 1140; National biotope: Coarse and medium mediolittoral sands, exposed to wave action with Donacilla cornea и Ophelia bicornis) • Cystoseira barbata and Cystoseira crinita (MSFD: Shallow rocks and biogenic reefs. Habitats Directive: 1170; National biotope: Infralittoral seabed with perennial associations of Cystoseira spp.). • Phyllophora crispa (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: lower infralittoral with Phyllophora crispa). • Mytilus galloprovincialis and Mytilaster lineatus (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: infralittoral rocks encrusted with black mussels Mytilus galloprovincialis и Mytilaster lineatus). • Zostera marina and Zostera noltei seagrasses (MSFD: Shallow sands. Habitats Directive: 1110; National biotope: Seagrass meadows). • Donax trunculus (MSFD: Shallow sublittoral sands. Habitats Directive: 1110; National biotope: coarse and medium sands with Donax trunculus). • Lentidium mediterraneum (MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: fine and medium sands with Lentidium mediterraneum). • Arenicolla marina (MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: sand with Arenicolla marina и Callianassa spp.). • Chamelea gallina. (MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: sands with Chamelea gallina). • Upogebia pusilla. (MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: muddy sands with Upogebia pusilla). **1.2.1 Maintain the abundance and biomass of the typical zoobenthos and phytobenthos species by preventing the deterioration of marine environment resulting from sealing, nutrient enrichment , smothering, abrasion and extraction of living or non-living resources according to the threshold values specified in the Bulgarian Art. 10 MSFD Report:** • Abundance (Donacilla cornea) > 4500 individuals /m^2; Biomass (Donacilla cornea) > 2500 individuals/m2 (Table I.2.5 of the Bulgarian MSFD Art. 10 report)(MSFD: Mediolittoral sediments. Habitats Directive: 1140; National biotope: Coarse and medium mediolittoral sands, exposed to wave action with Donacilla cornea и Ophelia bicornis) • Abundance and biomass of Cystoseira barbata (thresholds: horizontal coverage: 12500 sq. cm per m2., average dry biomass: 600 grams per m^2; average fresh biomass: 3000 grams per m2); Cystoseira crinita (thresholds: horizontal area covered: 15000 sq. cm per m2., average dry

	biomass: 500 grams per m2; average fresh biomass: 2500 grams per m2)(MSFD: Shallow rocks and biogenic reefs. Habitats Directive: 1170; National biotope: Infralittoral seabed with perennial associations of Cystoseira spp.). • Biomass as wet weight (Mytilus galloprvincialis) > 20000 g/m2; biomass as wet weight (Mytilaster lineatus) > 3000 g/m2 (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: infralittoral rocks encrusted with black mussels Mytilus galloprovincialis и Mytilaster lineatus). • Abundance(Phyllophora crispa): horizontal area cover > 3800 sq. cm/m2; average dry biomass > 70 g/m2; average wet biomass > 180 g/m^2 (Source: Table I.2.12 of the Bulgarian MSFD Art. 10 report) (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: lower infralittoral with Phyllophora crispa). • Abundance (Chamelea gallina) > 400 individuals/m2; biomass > 300 g/m^2 (Source: Table I.2.18 of the Bulgarian MSFD Art. 10 report). Abundance (Upogebia pusilla) > 90 individuals per m2; biomass (Upogebia pusilla) > 100 grams per m2 (threshold > 100 g/m2) (Table I.2.18 of the Bulgarian GES report)(MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: sands with Chamelea gallina). • Abundance (Donax trunculus) > 175 individuals per m^2 and biomass (Donax trunculus) > 350 g/m^2 (Source: Table I.2.16 of the Bulgarian MSFD Art. 10 report) (MSFD: Shallow sublittoral sands. Habitats Directive: 1110; National biotope: coarse and medium sands with Donax trunculus). • Abundance (Lentidium mediterraneum) > 4500 individuals per m^2; biomass > 250 g/m^2 (Source: Table I.2.17 of the Bulgarian MSFD Art. 10 report) (MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: fine and medium sands with Lentidium mediterraneum). • Abundance (Zostera noltii, Zostera marina) > 500 ind./m^2); Biomass, dry (Zostera noltii, Zostera marina) > 60 g/m^2 (MSFD: Shallow sands. Habitats Directive: 1110; National biotope: Seagrass meadows). • Average biomass of the Mytilus galloprovincialis: CPUA (Cape Kaliakra) = 61.337 ± 54.755 kg/ha; CPUA (Balchik) = 701.108 ± 636.879 kg/ha; CPUA (Cape Emine) = 655.208 ± 349.593 kg/ha; CPUA (Cape "Maslen Nos") = 300.291 ± 203.687 kg/ha (Source: Table I.2.21 of the Bulgarian MSFD Art. 10 report) (MSFD Shelf sublittoral rocks and biogenic reefs, HD: 1170) **1.3.1 Maintain the population demographic characteristics of the benthic habitat defining species according to the threshold values defined in Bulgarian MSFD Art. 10 report:** • Maintain the population demographic characteristics of the typical species (Chthamalus stellatus, Melaraphe neritoides, Ligia italica, Mytilaster lineatus, Mytilus galloprovincialis) within their threshold

	values (operational by 2018)(MSFD: Mediolittoral rocks. Habitats Directive: 1170; National biotope: Upper mediolittoral with Chthamalus stellatus, Melaraphe neritoides и Ligia italica) • Length (Donacilla cornea) > 16 centimetres (MSFD: Mediolittoral sediments. Habitats Directive: 1140; National biotope: Coarse and medium mediolittoral sands, exposed to wave action with Donacilla cornea и Ophelia bicornis) • Maintain the condition of the Cystoseira barbata and Cystoseira crinita at the present state of unaffected areas (Cape "Maslen Nos", reef of Kiten) (MSFD: Shallow rocks and biogenic reefs. Habitats Directive: 1170; National biotope: Infralittoral seabed with perennial associations of Cystoseira spp.). • Average size of Mytilus galloprvincialis is ≥ 26.5 cm (1.2.1) and the average size of Mytilaster lineatus is ≥ 9.0 cm (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: infralittoral rocks encrusted with black mussels Mytilus galloprovincialis и Mytilaster lineatus). • Average body size in the population of Donax trunculus is maintained above the threshold values indicative of the reference condition (reference area: Veleka River mouth). • Maintain the average population density of Arenicolla marina is maintained above the threshold values indicative of the reference condition (reference area: "Cape Emine-Irakli" protected area) • Average shell length Mytilus galloprovincialis is within the threshold values specified in Table I.2.22 of the Bulgarian MSFD Art. 10 GES report). **1.4.1 The decline of the range of the MSFD predominant habitat types, relevant habitats under Habitats directive and associated national biotopes listed in the Bulgarian MSFD Art. 10 report should approximate zero by 2020 by implementation of appropriate management measures on sealing by man-made structures, nutrients input, associated eutrophication and bottom hypoxia, smothering by dumping, and seabed abrasion by dredging and extraction of marine living and (if applicable) non-living resources.** **1.5.1 The area of the MSFD predominant habitat types is stable or increasing and not smaller than the baseline values (Favourable Reference Area for Habitats Directive habitats), listed in the Bulgarian MSFD Article 10 Report. Indicators:** • Maintain the habitat area of the shallow sublittoral sands above the following threshold values (Source: Table I.2.15 of the Bulgarian MSFD

	Art. 10 report): • Sivriburun-Kaliakra Assessment Area >= 32.46 km^2; Kaliakra-Galata Assessment Area >= 43.89 km^2; Galata-Emine Assessment Area >= 35.46 km^2; Emine-Sozopol Assessment Area >= 70.71 km^2; Sozopol-Rezovo Assessment Area >= 36.11 km^2." • Maintain the habitat area of the mediolittoral rocks above the following threshold values (Table I.2.1, Bulgarian Art. 10 GES report): Sivriburun-Kaliakra Assessment Area (BLKBG-Sivriburun-Kaliakra) >= 2.162 km^2; Kaliakra-Galata Assessment Area (BLKBG-Kaliakra-Galata) >= 4.058 km^2; Galata-Emine Assessment Area (BLKBG-Galata-Emine) >= 1.762 km^2; Emine-Sozopol Assessment Area (BLKBG-Emine-Sozopol) >= 11.363 km^2; Sozopol-Rezovo Assessment Area (BLKBG-Sozopol-Rezovo) >= 3.649 km^2" • Maintain the habitat area of the mediolittoral sediments above the following threshold values (Table I.2.4, Bulgarian Art. 10 GES report): Sivriburun-Kaliakra Assessment Area (BLKBG-Sivriburun-Kaliakra) >= 3.854 km^2; Kaliakra-Galata Assessment Area (BLKBG-Kaliakra-Galata) >= 4.261 km^2; Galata-Emine Assessment Area (BLKBG-Galata-Emine) >= 67.893 km^2; Emine-Sozopol Assessment Area (BLKBG-Emine-Sozopol) >= 8.827 km^2; Sozopol-Rezovo Assessment Area (BLKBG-Sozopol-Rezovo) >= 2.146 km^2; • Maintain the habitat area of the shallow sublittoral rocks above the following threshold values (Table I.2.7. of the Bulgarian Art. 10 GES Report): Sivriburun-Kaliakra Assessment Area (BLKBG-Sivriburun-Kaliakra) >= 42.82 km^2; Kaliakra-Galata Assessment Area (BLKBG-Kaliakra-Galata) >= 5.06 km^2; Galata-Emine Assessment Area (BLKBG-Galata-Emine) >= 11.07 km^2; Emine-Sozopol Assessment Area (BLKBG-Emine-Sozopol) >= 81.04 km^2; Sozopol-Rezovo Assessment Area (BLKBG-Sozopol-Rezovo) >= 20.79 km^2" • Maintain the area of the habitat of Modiolula phaseolina above the following reference/threshold values (per assessment area): 2626.906 km^2; • Maintain the habitat area of the shelf sublittoral muds above to the following reference/threshold values: reference area ≥ 8753.368 km^2. • Maintain the habitat area of shelf sublittoral sands above the following reference/threshold values (per assessment area): Area (Northern shelf AA) = 32.131 km^2; Area (Central shelf AA) = 78.300 km^2; Area (Southern shelf AA) = 61.275 km^2; **1.6.1. Maintain the condition of the typical communities of Mytilus galloprovincialis and Mytilaster lineatus within the threshold values at an unaffected region (Aladja banka): Mytilus galloprovincialis (average wet weight ≥ 20000 g/sq. m; average body length ≥ 26.5 mm); Mytilaster lineatus (average wet weight ≥ 3000 g/sq. m; average body length ≥ 9.0 mm).** **1.6.1. Maintain the condition of the typical communities of Phyllophora crispa in line with the conditions in relatively unaffected reference area -**

	the Kiten reef. Threshold values: horizontal area cover ≥ 3800 sq. cm/sq. m; average dry biomass ≥ 70 g/sq. m; average wet biomass ≥ 180 g/sq. m (Source: Table I.2.12 of the Bulgarian MSFD Art. 10 report). **1.6.3 Maintain the physico-chemical conditions of the MSFD predominant habitat types, relevant habitats under Habitats directive and associated national biotopes listed in the Bulgarian MSFD Art. 10 report in the coastal waters within the threshold values in Ordinance No. N-4 of 14/09/2012 on the characterization of surface waters Annex № 6 from Article12 (4) (according to the requirements of the Water Framework Directive).** **6.1.1 Targets**: The area of the mediolittoral rocks and sediments, affected by human-induced change in hydrographical conditions, sealing, smothering and abrasion stays below the following threshold values (Table I.2.3 in Bulgarian MSFD Article 9 Report): Sivriburun-Kaliakra Assessment Area < 10%; Kaliakra-Galata Assessment Area - maintain the present state; Galata-Emine Assessment Area < 10 %; Emine-Sozopol Assessment Area - maintain the present state; Sozopol-Rezovo Assessment Area - maintain the present state. **6.1.1 Target**: In the MSFD predominant habitat types, relevant habitats under Habitats directive and associated national biotopes listed in the Bulgarian MSFD Art. 10 report, the pressure from abrasion from active fishing gear should decrease by 2020 below the following threshold values: Within Natura 2000 protected areas: 0% of the habitat area affected; Outside Natura 2000 protected areas: <= 20% of the habitat area; **6.2.1 Target**: Maintain the presence of the particularly sensitive species in the structure of macrozoobethos according to the threshold values in the Bulgarian MSFD Article 10 report. • Patella ulyssiponensis, Chthamalus stellatus, Melaraphe neritoides (MSFD: Mediolittoral rocks. Habitats Directive: 1170; National biotope: Upper mediolittoral with Chthamalus stellatus, Melaraphe neritoides и Ligia italica) • Ophelia bicornis, Donacilla cornea (MSFD: Mediolittoral sediments. Habitats Directive: 1140; National biotope: Coarse and medium mediolittoral sands, exposed to wave action with Donacilla cornea и Ophelia bicornis) • The relative abundance of the sensitive species from I ecological group % ESC IA => 30 % (MSFD: Mediolittoral sediments. Habitats Directive: 1140; National biotope: Coarse and medium mediolittoral sands, exposed to wave action with Donacilla cornea и Ophelia bicornis) • Maintain the presence of sensitive species in the benthic communities • Particularly sensitive species of macroalgae % ESC IA => 60 % (Source: Table I.2.9 of the Bulgarian MSFD Art. 10 report)(MSFD: Shallow rocks and biogenic reefs. Habitats Directive: 1170; National biotope: Infralittoral seabed with perennial associations of Cystoseira spp.). • Apoglosium ruscifolium and Polysiphonia elongata (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope:

	lower infralittoral with Phyllophora crispa). • The relative abundance of sensitive species (% ESG IA) of macroalgae (Apoglosium ruscifolium and Polysiphonia elongata) => 60 60% of the total biomass of the species of macroalgae (Source: Table I.2.9 Bulgarian MSFD Art. 10 report)((MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: lower infralittoral with Phyllophora crispa).) • Lepidochitona caprearum, Lepidochitona cinerea, Acanthochitona fascicularis, Gibbula divaricata, Eriphia verrucosa, Pilumnus hirtellus, Pachygrapsus marmoratus, Xantho poressa, Pisidia longicornis, Clibanarius erythropus, Palaemon adspersus, Palaemon elegans, Hippolyte leptocerus, Athanas nitescens (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: infralittoral rocks encrusted with black mussels Mytilus galloprovincialis и Mytilaster lineatus).. • Hesionura coineaui, Magelona papillicornis, Microphthalmus similis, Scolelepis squamata, Eurydice dollfusi are present in the benthic communities(MSFD: Shallow sublittoral sands. Habitats Directive: 1110; National biotope: coarse and medium sands with Donax trunculus). • Pestarella (Callianassa) candida, Tellina tenuis, Hesionura coineaui, Magelona papillicornis, Scolelepis squamata (MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: fine and medium sands with Lentidium mediterraneum). **6.2.2 Target.** Multimetric indexes show high biodiversity and domination of the sensitive and tolerant species over the opportunistic species, according to the threshold values of the Bulgarian MSFD Article 10 report**.** • In 95 % of the area of infralittoral rocks and biogenic reefs, the multi-metric indexes are within the following GES threshold values: EEI = 6, EEI-c = 6, according to table I.2.10 the Art. 10 MSFD report (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: lower infralittoral with Phyllophora crispa). • Multi-metric indexes: AMBI < 3.3; Average species abundance S < 14 species/0.1 sq. m; M-AMBI≤0.85; Shannon biodiversity index H' < 2.44 (MSFD: Mediolittoral sediments. Habitats Directive: 1140; National biotope: Coarse and medium mediolittoral sands, exposed to wave action with Donacilla cornea и Ophelia bicornis) • In 80 % of the national area of the habitats, the multi-metric indexes are within the following GES threshold values: average species abundance S ≥ 40 species/0.1 square meters; Shannon biodiversity index H' ≥ 2.5; AMBI (Borja et al. 2000) ≤ 3.3; M-AMBI (Muxica et al. 2007) ≥ 0.55. Reference conditions in the end of 1990-s and the beginning of 2000-s (Source: Table I.2.20 of the Bulgarian MSFD Art. 10 report) (MSFD: Mediolittoral sediments. Habitats Directive: 1140; National biotope: Coarse and medium mediolittoral sands, exposed to wave action with Donacilla cornea и Ophelia bicornis) • Ecological Evaluation Index (EEI) (Panayotidis et al., 2004) > 6; Ecological

	Evaluation Index-continuous formula (EEI-c) (Orfanidis et al., 2011) > 6; (Source: Table I.2.10 of the Bulgarian MSFD Art. 10 report)(MSFD: Shallow rocks and biogenic reefs. Habitats Directive: 1170; National biotope: Infralittoral seabed with perennial associations of Cystoseira spp.). • The average species richness per 0.1 m^2 (S) and the index of Shannon in the shallow sublittoral rocks and biogenic reefs with Mytilus galloprvincialis and Mytilaster lineatus within the reference/threshold values of an unaffected area (operational by 2018) (MSFD: Shallow rocks and biogenic reefs; Habitats Directive: 1170; National biotope: infralittoral rocks encrusted with black mussels Mytilus galloprovincialis и Mytilaster lineatus). • In 95 % of the area of the shallow sublittoral rock and biogenic reefs, the multi-metric indexes are within the following GES threshold values: Ecological Evaluation Index (EEI) (Panayotidis et al., 2004), EEI > 6; Ecological Evaluation Index-continuous formula (EEI-c) (Orfanidis et al., 2011), EEI-c>6 (Source: Table I.2.10 of the Bulgarian MSFD Art. 10 report) (MSFD: Shallow rocks and biogenic reefs. Habitats Directive: 1170; National biotope: Infralittoral seabed with perennial associations of Cystoseira spp.). • Multi-metric indexes: S ≥ 15 species/0.1 square meters; Shannon biodiversity index H' ≥ 2.9; AMBI ≤ 3.3; M-AMBI >= 0.85 (MSFD: Shallow sublittoral sands. Habitats Directive: 1110; National biotope: coarse and medium sands with Donax trunculus); • Multi-metric indexes (MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: fine and medium sands with Lentidium mediterraneum) are within the following GES threshold values: Species abundance S ≥ 17 species/0.1 square meters; Shannon biodiversity index H' ≥ 2.1; AMBI ≤ 3.3; M-AMBI ≥ 0.85. • In 95 % of the habitat area of the shelf sublittoral mixed sediments , the multi-metric indexes are within the following GES threshold values: S ≥ 22 species/0.1 square meters; Shannon biodiversity index H' ≥ 2.7; AMBI ≤ 3.3; M-AMBI ≥ 0.55 (Source: Table I.2.26 of the Bulgarian MSFD Art. 10 report) (MSFD: Shelf mixed sediments; National biotope: shelly muds with Modiolula phaseolina). • In 80 % of the shelf sublittoral muds, the multi-metric indexes are within the following GES threshold values: S ≥ 31 species/0.1 square meters; Shannon biodiversity index H' ≥ 2.5; AMBI ≤ 3.3; M-AMBI ≥ 0.55 (Source: Table I.2.24 of the Bulgarian MSFD Art. 10 report) (MSFD: Shelf muds; National biotope: shelf muds with Nephthys, Pitar, Spisula, Abra). • In 95 % of the shelf sublittoral muds, the multi-metric indexes are within the following GES threshold values: the average species abundance S ≥ 22 species/0.1 square meters; Shannon biodiversity index H' ≥ 2.6; AMBI (Borja et al. 2000) ≤ 3.3; M-AMBI (Muxica et al. 2007) ≥ 0.55 (Source: Table I.2.25 of the Bulgarian MSFD Art. 10 report). (MSFD: Shelf muds; National biotope: muds of the lower circalittoral with Terebellides

	stroemi). • In 95 % of the shelf sublittoral sands, the multi-metric indexes are within the following GES threshold values: the average species abundance S ≥ 50 species/0.1 square meters; Shannon biodiversity index H' ≥ 3.1; AMBI (Borja et al. 2000) ≤ 3.3; M-AMBI (Muxica et al. 2007) ≥ 0.55 indicative of the reference conditions identified in the Veleka River mouth (Source: Table I.2.19 of the Bulgarian MSFD Art. 10 report)(MSFD: Shallow sublittoral sands; Habitats Directive: 1110; National biotope: sands with Chamelea gallina). **D3 – State of commercial fish and shellfish stocks** **Pressure targets** **3.1.1 Fishing Mortality (F) by reduced fishing effort are listed below referring to the concerned species:** • Reducing fishing effort to F<= FMSY =0.4 (whiting) • Reducing in fishing effort to F <= FMSY = 0.15 (turbot) • Reducing fishing effort in the wintering areas (horse mackerel) • Reducing fishing effort to F<= FMSY =0.54 (anchovy) • Reducing fishing effort to F<= FMSY =0.18 (dogfish) • Reducing fishing effort to F<= FMSY =0.46 (red mullet) **3.1.2. Catch/biomass ratio index – maintain the threshold value of catch/biomass ratio less than:** • Catch-biomass ratio <= 0.082 (sprat) • Catch-biomass ratio <= 0.033 (turbot) **State targets** **3.2.1. Spawning stock biomass of sprat** - STECF EWG 13-12 (Sampson et al., 2013) does not offer reference points as regards SSB for the sprat stock but according to the results from the regional assessment SSB varied between 200 000 and 500 000 tons. The proposed trend for this indicator is increasing of the SSB at regional level; The indicator needs additional development and will be operational at regional level toward 2018 (Population size (spawning stock biomass - SSB) of sprat (thousand tons)). **3.2.1. Spawning stock biomass (SSB**) - increasing the SSB at regional level at the level of Black Sea region for whiting (Merlangius merlangus euxinus), turbot (Psetta maxima), horse mackerel (Trachurus mediterraneus ponticus), anchovy (Engraulis encrasicolus), dogfish (Squalus acanthias), red mullet (Mullus barbatus ponticus) (thousand tons). **3.2.2. Biomass indexes** - maintain increasing trend of the biomass values above the reference level of 55 thousand tons (sprat) in front of Bulgarian Black Sea coast. Basic reference state was for 2007-2011.The indicator needs additional development and will be operational at national level toward 2014 (Species abundance (biomass) of sprat (Sprattus sprattus)

	(CPUE, kg/h)). **3.2.2. Biomass indexes** - increasing trend of the values of the biomass indices at national level. Levels of the index should not be lower than reference level of 1700 tons (turbot) (Species abundance (biomass) of turbot (Psetta maxima) (CPUE, kg/h)). **3.2.2 Biomass indices are listed below referring to the concerned species (Species abundance (biomass) of Sprat (Sprattus sprattus) and turbot (CPUE, kg/h))**: Maintaining the sprat stock at values of approximately 60000 tonnes at the Bulgarian littoral; Recovery of the turbot stock to value of 1500-2000 tonnes at the Bulgarian littoral. **3.3.1.Proportion of fish (sprat) larger than the mean size of first sexual maturation** – The trend to sustain of the proportion at reference level of 68% (sprat).Basic condition for calculations of the limit reference points the contemporary state of the populations have been used. The indicator needs of additional development and will be operational toward 2014 (Size of individuals of sprat (Sprattus sprattus), cm) **3.3.1. Proportion of fish (turbot) larger than the mean size of first sexual maturation** - The proportion of fish with length higher than the mean at sexual maturation (42 cm), and to be over the reference value of 74% (Size of individuals of turbot (Psetta maxima), cm) **3.3.1. Mean length of fish (turbot)** in the catch should not be under the reference level of 56 cm (± 10 %) (Size of individuals of turbot (Scophthalmus/Psetta maxima), cm). **3.3.3. 95 % from the observed length structure of the species (sprat)** in the research surveys– the indicator needs of additional development and will be fully operational at national level toward 2018. The main lack of data and knowledge is the inability to calculate this indicator before 2012, due to the differences of the length structure and methodological issues. The lack of the genetic effects on the population due to overexploitation are also obstacles (Size of individuals of sprat (Sprattus sprattus), cm). **3.3.3**. 95 % percentile from the observed length structure of the species (turbot) in the research surveys – 95 % percentile from length structure of the population to show stable trend with mean reference value of 62 cm for turbot (Size of individuals of turbot (Psetta maxima) (cm). **Relevant MSFD targets defined in the Article 10 reporting of Bulgaria under Descriptors 1, 4 – Biodiversity (Non-commercial fish species)** **State targets** 1.1.1 Targets – Distribution of Round goby (Neogobius melanostomus) and other demersal fish species is not significantly affected by human activities: the geographic and depth distribution of sensitive fish should meet individual indicator targets in a statistically significant proportion of species monitored. 1.2.1 and 4.3.1 Targets: Abundance of the Round goby (Neogobius

	melanostomus) is not negatively affected by human activities. 6.2.2 Targets. Coastal assessment area: Population abundance of non-commercial fish species is above the following threshold values, indicative of GES: • Total number of species (S) > 10 • Shannon index H' (log2) > 1,454 • Fisher's alpha (a) > 0,486 • Gini-Simpson (1- a) > 0,514 • Taxonomic distinctness (Δ*) > 79,58 6.2.2 Targets. Shelf assessment area: Population abundance of non-commercial fish species is above the following threshold values, indicative of GES: • Total number of species (S) > 7.204 • Shannon index H'(log2) > 0.896 • Fisher's alpha (a) > 0.694 • Gini-Simpson (1- a) > 0.306 • Taxonomic distinctness (Δ*) => 89.18 **Impact targets** Reduction of the by-catch mortality **State / Impact targets under Descriptor 1, 4 - Biodiversity (Marine mammals):** 1.1.1. Target: Preserve the existing distribution range of the three species of marine toothed whales by implementing appropriate management measures. 1.2.1 Target: Positive trend in the population abundance of the three species of marine toothed whales (*Phocoena phocoena, Turciops truncatus, Delphinus delphis*). 4.3.1 Target: Positive trend in the population abundance of the three species of marine toothed whales (*Phocoena phocoena, Turciops truncatus, Delphinus delphis*). **Environmental targets under Descriptor 1, 4 - Biodiversity (Seabirds):** Environmental target on criterion 1.3 "Condition of the population", indicator 1.3.1: The number of registered cases of injured and dead birds as a result of the negative impact of human activities decreases.
Descriptors	*Categorisation of the measures to the descriptors in lined with Annex 1 MSFD. The descriptors are identified by their short form:* **D1- Biodiversity** **D3 – State of commercial fish and shellfish stocks**

	D4 – Food web **D6 – Sea – floor integrity**
Main pressures	*Using the analysis carried out in 2012 as a basis, categorisation of the measures in accordance with the pressures defined in Annex 3 MSFD, Table 2:* **Physical damage** -abrasion (e.g. impact on the seabed of commercial fishing, boating, anchoring), —selective extraction (e.g. exploration and exploitation of living and non-living resources on seabed and subsoil) **Physical loss** - smothering (e.g. by man-made structures, disposal of dredge spoil), -sealing (e.g. by permanent constructions) **Other physical disturbance** - marine litter **Nutrient and organic matter enrichment** - Inputs of fertilisers and other nitrogen and phosphorus-rich substances (e.g. from point and diffuse sources, including agriculture, aquaculture, atmospheric deposition), —inputs of organic matter (e.g. sewers, mariculture, riverine inputs) **Biological disturbance** - selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing) **Other pressures**
Main drivers	*The sectors/activities targeted by the measure* Recreational activities, tourism; - Industry, urbanization (coastal and riverine from land – municipal and industrial waste water discharge, dredging and dumping of dredging materials); - Agriculture; - Activities associated with the extraction of living resources (fisheries, including fishing); - Activities related to the production of seafood (aquaculture); - Sea-based mobile activities: transport / shipping, including with - small boats) - Maritime energy production activities (offshore oil and gas operations)
Characteristics	*Using the analysis carried out in 2012 as a basis, categorisation of the*

	measures in accordance with the characteristics defined in the "PoM Recommendations": - Marine and coastal birds - Marine mammals - Fish - Benthic habitats - Pelagic habitats
Link to other directive/legislation/ policy	*Aligning objectives with other legal commitments* Convention on Biological Diversity Convention for the Protection of the Black sea against pollution Strategic Action Plan for the Environmental Protection and Rehabilitation of the Black Sea (2009) The Black Sea Biodiversity and Landscape Conservation Protocol to the Convention on the protection of the Black sea against pollution, 2002 (for Bulgaria in force from 20 June 2011). Directive of maritime spatial planning (2014) Water Framework Directive 2000/60/EC Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora Directive 2009/147/EC of the European Parliament and of the Councl of 30 November 2009 on the conservation of wild birds Environmental Impact Assessment (EIA) Directive Common Fishery Policy (CFP) and relevant EU Regulations **National legislation**: Fisheries and Aquaculture Act Environmental Protection Act Biological Diversity Act Protected Areas Act
Necessity for transnational regulation	*Information as regarding the necessity for regulations at EU, regional and international level to achieve MSFD environmental objectives.* No
Mode of implementation	*Stating the implementation process in line with the „PoM Recommendations"; multiple options possible:* • Legislative • Technical
Implementation zones	*i.e. the spatial impact of the measure: MS land / FW, WFD TW, WFD CW, Territorial waters, EEZ* Coastal (WFD CW), Territorial waters and Exclusive Economic Zone (EEZ) of Republic of Bulgaria

Contribution of the measure to achieving the target	*– using technical information* The measure will contribute to more efficient, synchronized between the Black Sea Member States, protection of priority habitats (subject of protection) and minimizing the negative impacts on them, which will enable a balanced functioning of marine ecosystems. Taking into account the broad spatial coverage (covering the most priority areas for biodiversity conservation) and a wide range of prevention / protection from anthropogenic pressure, the measure is expected to have a significant contribution to achievement of GES regarding Descriptors 1 (Biodiversity), 3 (Status of commercial fish and shellfish stocks) and 6 (Sea-floor integrity). At this stage has no defined environmental targets concerning Descriptor 4 (Food webs), but the contribution of the measure to achieve / maintain a good status of marine environment under this Descriptor is undoubted. A quantitative assessment of the contribution of this measure to achieve the targets still cannot be made.
Transboundary impact	*Information on the impact of the measures on transboundary neighbours* The implementation of the measure is not expected to have negative transboundary impact on the waters of other countries shared the Black sea marine region. The measure is expected to contribute to increasing biodiversity with transboundary effect which scope cannot be predicted at this stage.
Costs	*Costs for implementation* **First rough assessment: medium (50.000 - 200.000 €)** The following elements of costs are considered: • research costs (research time, information and meeting cost) • costs for agreement with the working team (staff time for preparation, follow up, meetings with neighbouring MS,travel & other costs) • negotiation costs (planning & preparation, drafting agreement & ratification, meetings with neighbouring MS, travel & other costs) • communication costs (advertisement, staff time, other administration costs) • costs of stakeholder consultations (staff time for preparation, follow up, meetings with stakeholders) • cost for control staff training (preparation, training material, training, follow up) • control costs
Effectiveness	*Effectiveness of the measure in reaching targets (either qualitative description, or according to indicators: indicators for environmental targets and for GES, proposal for statistical indicators in support of Art. 18 interim reports* The measure, in combination with measure 14 " Elaboration/update of

	management plans for MPAs according to requirements of the MSFD and including both national and common targets for achieving of GES" is expected to have **high effectiveness** for achieving the targets defined for GES related to protection of habitats and achieving favorable conservation status, respectively to preserve and increase the biodiversity of marine flora and fauna. A prerequisite for this is the wide spatial coverage (covering the most priority areas for biodiversity conservation) and a wide range of prevention / protection from anthropogenic pressure.
Indicator(s) to measure effectiveness	*Should be based on existing indicators.* 1) Investigate current MPA distribution, coherence and representativeness for combined BG/RO MPAs in EEZ's 2) Potentially designating new "missing" MPA's 3) Drafting MPA's management plans (stepwise) 4) Control of regulated activities within or near MPAs
Socio-economic assessment	***Cost Effectiveness Assessment:*** **cost effective** ***Cost Benefit Assessment:*** **medium** The measure is expected to have **high effectiveness** to achieve common MFSD targets. At the same time, public costs for the implementation of the measure are not high too. Unfortunately, a quantitative assessment of the cost effectiveness of the measure cannot be made as the information on the benefits (in quantitative form) is not available. Additional socio-economic consequences of this measure are: - improved status of protected species of marine flora and fauna and their habitats; - an improvement of abundance (number) of economically valuable marine species, positively affected related sectors (fisheries sector, recreational fisheries for fish and shellfish, etc.); - ecosystem services improving.
Coordination level	*Selection of the governance level that will coordinate the implementation of the measures, local, sub-national, national, bilateral, sub-regional, regional, EU-level, international* national bilateral
Technical feasibility	*Options*: • Frequently applied; extensive experience / evidence of good practice
Body responsible for the measure implementation	Ministry of Environment and Waters (MoEW), Black Sea Basin Directorate (BSBD), Regional Inspectorates of Environment and Water - Varna and Burgas (RIEW - Varna and RIEW Burgas), NGOs, scientific institutes, universities, laboratories, specialized in field of the marine biology and ecology

Financing opportunities	State budget, Operational Programme "Environment" 2014-2020, structural funds operated by the Ministry of Agriculture and Food, respectfully National Agency of Fisheries and Aquaculture (NAFA) as European Maritime and Fisheries Fund (EMFF), EU projects (i.e Horizon 2020 Program RO-BG CBC program, LIFE Programme)
Temporal coverage	**Starting: 2018**
Difficulties in implementation	*Provide information on the potential challenges that could likely faced in implementation.* Possible objections from the business against extention of the scope of protected areas or introduction of more restrictive regime. Refusal to comply with the prohibitions and restrictions established in these protected areas.