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: 9**
Measure title	Promotion and stimulation (including financial) of environmental friendly fishing and collection of shellfish	
Short, precise description of the measure	This measure is developed as common (coordinated) measure with Romania in the scope of 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", funded by the DG Environment, EC The extraction of one of the most widespread invasive species in the Black sea (Rapana sp.), but of high economic importance, is usually done by bottom trawling with beam trawls. The extraction of other shellfish, even on a smaller scale, is also linked to alteration of sea-floor integrity and damages on seabed (benthic) habitats. The measure is planned against the high destructive impact of beam trawls and other techniques for shellfish extraction on marine ecosystems – a direct damage and even destruction of seabed (benthic) habitats and species (flora and fauna). The aim is to encourage the use of more environmentally friendly techniques for extraction, respectively reduced damage to the marine environment and the relevant benefits. The measure implementation involves the following activities: 1. Development / implementation of a mechanism for stimulating, including and financial one for implementation of environmentally friendly methods for Rapana and shellfish (mussels) extraction; 2. Conducting awareness campaigns for fishermen, distribution of information materials. 3. Conducting education campaigns for Fisheries Local Action Groups (FLAGs) and individuals associated with the effective use of environmentally friendly techniques and equipments for rapana and shellfish (mussels) extraction.	

EU measure category	*Categorisation of the measure in accordance with the "PoM Recommendations":* **2a**
Key Types of Measures	*KTMs as defined in the „PoM Recommendations". Measures can be categorised in one or multiple KTMs.* **KTM 35 Measures to reduce biological disturbances in the marine environment from the extraction of species, including incidental non-target catches** <u>Other relevant KTM under Directive WFD 2000/60/EC:</u> 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 sq. cm (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 indexes 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
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). **Biological disturbances** - selective extraction of species, including incidental non-target catches (e.g. by commercial and recreational fishing).
Main drivers	*The sectors/activities targeted by the measure* Benthic trawling Extracton of living resources – Rapana and shelfish (mussles)

	Scientific marine researches and educational activities
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":* - Benthic habitats - Fish
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) EU Blue Growth initiative Habitats Directive (Directive 92/42/EEC) Water Framework Directive (Directive 2000/60/EC) CFP (Regulation (EU) 1380/2013) and its related legislations (e.g. Regulation 1967/2006, all technical measures, on fishing efforts); Regulation (EC) № 1198/2006 of the European Parliament and of the Council of 27 July 2006 on the European Fisheries Fund. **National legislation of Bulgaria:** 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.* Considering the nature and extent of the impact of benthic trawling on seabed habitats and species, and subsequently on the whole ecosystem, in order to ensure maximum effectiveness of the measure, it is necessary to be promoted using of environmentally friendly techniques for the extraction of shells and others shellfish, not only for the two Black Sea countries and EU members, but for all Black Sea countries.
Mode of implementation	*Stating the implementation process in line with the „PoM Recommendations"; multiple options possible:* • Legislative • Policy driven • Economic
Implementation zones	*i.e. the spatial impact of the measure: MS land/FW, WFD TW, WFD CW, Territorial waters, EEZ, CS (beyond EEZ), Beyond MS waters*

	coastal waters (WFD CW), territorial waters of Republic of Bulgaria
Contribution of the measure to achieving the target	*– using technical information* The implementation of the measure will contribute directly to protecting the seabed integrity, reducing the physical damage to seabed habitats and related changes in functioning of marine ecosystems, including interactions between different trophic levels. Respectively the measure will reduce the direct and indirect loss of biodiversity as a result of seabed trawling. The measure will contribute to decreasing trend in the spatial extent of the areas and the predominant types of habitats affected by constant changes as a result of trawling, and to reducing of already existing negative changes on predominant habitats (spawning, breeding and feeding areas, fish migration routes, marine birds and mammals). Although there are already established regime to regulate the spatial extent, respectively the effects of beam trawling, the measure would provide specific information for more effective regulation of this activity. Given the broad spatial scale (whole marine area of Bulgaria) and the importance of this pressure, respectfully the impact of seabed trawling, the measure is expected to have a significant contribution to achieving the targets defined under Descriptors 1 (Biodiversity), 3 (State of commercial fish and shellfish stocks) and 6 (Seabed integrity). Regarding Descriptor 4 (Food web), still there are not set environmental targets at this stage, 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 environmental targets cannot be done yet.
Transboundary impact	*Information on the impact of the measures on transboundary neighbours* The implementation of the measure is not expected to have negative effects on the marine environment of the other Black sea countries. The measure is expected to have a favorable impact, which would affect the marine waters of the neighboring countries by protecting / enhancing biodiversity, with an impact on the aquatic environment of other Black Sea countries in relation to a highly mobile species and to maintain / increase stocks of migratory commercially valuable fish species in the Black Sea.

Costs	**First rough assessment: medium (50.000 – 200.000 €)** 1) Costs of development / implementation of a stimuli mechanism including financial one for implementation of environmentally friendly techniques and equipments of Rapana and shellfish extraction; 2) Costs of conducting information campaigns, distribution of informational materials 3) Awareness building (educational campaign) of and advisory services for Fishery local action Groups (FLAGs) and individuals regarding effective use of environmental friendly fishing techniques and equipment for collecting of rapana and shellfish. **Total one off costs within MSFD cycle (6 years): medium (50.000 – 200.000 €)**
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* Taking into account he broad spatial coverage and significant pressure and impact of seabed trawling, it is expected that the measure will have a **potentially high effectiveness** to achieve / maintain good environmental status of marine environment under the following four Descriptors: D1 (Biodiversity), D3 (State of commercial fish and shellfish stocks), D4 (Food web) and D6 (Seabed integrity). The high efficiency is estimated to be "potential" because it depends on the efficiency of the mechanism for promoting the use of environmentally friendly techniques for extraction and the lack of significant administrative burdens.
Indicator(s) to measure effectiveness	*Should be based on existing indicators.* 1. Number of developed mechanisms to stimulate environmentally friendly techniques for rapana and shellfish extraction. 2. Number of fishermen / Fisheries Local Action Groups (FLAGs) taken initiatives to introduce environmental friendly technics and equipment 3. Number of conducted information campaigns / year.
Socio-economic assessment	
Coordination level	*Selection of the governance level that will coordinate the implementation of the measures, i.e. local, national Regional, bilateral* at local level

	at national level at bilateral level with Romania
Technical feasibility	*Options:* • Frequently applied; extensive experience / evidence of good practice
Body responsible for the measure implementation	Ministry of Agriculture and Food, National Agency for Fisheries and Aquaculture (NAFA), Fisheries Local Action Groups (FLAGs)
Financing opportunities	*Including EU-cofinancing* National and European funding (eg. European Maritime and Fisheries Fund (EMFF) - National Programme for Maritime Affairs and Fisheries 2014-2020 of Bulgaria
Temporal coverage	**Starting: 2017**
Difficulties in implementation	*Provide information on the potential challenges that could likely faced in implementation.* Fishermen fear on increasing (own) investment (costs) in fishery sector and loss of work places. There is a risk of low effectiveness of the measure if there is not provided good information to the target group. Low interest of possible heavy administrative procedures.