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**Marine Strategy Framework Directive – assessment of programmes of measures for
Denmark, Estonia, Greece, Croatia, Lithuania, Romania and Slovenia**

Abbreviations

BWMC	Ballast Water Management Convention
CFP	Common Fisheries Policy
EIA	Environmental Impact Assessment
GES	Good Environmental Status
GFCM	General Fisheries Commission for the Mediterranean
HELCOM	Convention on the Protection of the Marine Environment of the Baltic Sea Area
IMO	International Maritime Organisation
MARPOL	International Convention for the Prevention of Pollution from Ships
MPA	Marine Protected Area
MSFD	Marine Strategy Framework Directive
MSP	Maritime Spatial Planning
OSPAR	Convention for the Protection of the marine environment of the North-East Atlantic
RBMP	River Basin Management Plan
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
SEA	Strategic Environmental Assessment
TG Noise	MSFD Technical Group on Underwater Noise
TBTs	Tributyltin
UNEP/MAP	United Nations Environment Programme / Mediterranean Action Plan (Barcelona Convention)
UWWTD	Urban Waste Water Treatment Directive
WFD	Water Framework Directive

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SUMMARY FINDINGS AND RECOMMENDATIONS PER MEMBER STATE ON PROGRAMMES OF MEASURES, REPORTED UNDER ARTICLE 13(9) OF DIRECTIVE 2008/56/EC

The Commission assessed Member States' programmes of measures under the Marine Strategy Framework Directive (MSFD)¹ in its Report, published on July 31, 2018, to the European Parliament and the Council.²

The Report and the accompanying Staff Working Document³ noted that, out of the 23 maritime Member States, seven had reported their national programmes after the cut-off date of February 2017⁴ and could therefore not be assessed in time. This Staff Working Document now covers these seven Member States, i.e. Denmark, Estonia, Greece, Croatia, Lithuania, Romania and Slovenia. The general conclusions and recommendations made in that Report also apply for these Member States.

Building upon the July 2018 Staff Working Document, Part A of this Staff Working Document summarises, in a single document and based on the country-specific assessments⁵ carried out in line with Article 13(9) of the MSFD, how well the 23 maritime Member States cover pressures,⁶ having regard to the descriptors identified in Annex I of the MSFD.⁷ For

¹ Directive 2008/56/EC of the European Parliament and of the Council of 17 June 2008 establishing a framework for community action in the field of marine environmental policy (Marine Strategy Framework Directive), OJ L 164, 25.6.2008, p. 19.

² Report from the Commission to the European Parliament and of the Council assessing Member States' programmes of measures under the Marine Strategy Framework Directive, COM/2018/562 final.

³ SWD(2018) 393.

⁴ The Malta report, although submitted in April 2017, was included in the first assessment, as it required no translation.

⁵ The technical country-specific assessments were prepared for the Commission by an external consultant — see also http://ec.europa.eu/environment/marine/eu-coast-and-marine-policy/implementation/reports_en.htm.

⁶ Some Member States had indicated military and defence operations as an activity exerting pressure on the marine environment in their reports under Article 8 of the Directive. Depending on the descriptor, Member States have subsequently included measures as part of their Article 13 programme, while others failed to do so. While the technical Member State-specific assessments examine whether these pressures have been addressed, this document does not assess such aspects, since defence activities are outside the scope of the MSFD (Article 2(2)).

⁷ The 11 qualitative descriptors are defined in Annex I to Directive 2008/56/EC and are further specified in Commission Decision 2010/477/EU of 1 September 2010 on criteria and methodological standards on good environmental status of marine water (OJ L 232, 2.9.2010, p. 14), hereafter referred to as 'descriptors' and assigned a number between 1 and 11. The numbers refer to the respective numbered points in Annex I to the MSFD (D1 — Biodiversity, D2 — Non-indigenous Species, D3 — Commercial fish and shellfish, D4 — Food webs, D5 — Eutrophication, D6 — Sea-floor integrity, D7 — Hydrographical changes, D8 — Contaminants, D9 — Contaminants in seafood, D10 — Litter, D11 — Energy, including underwater noise). For the purpose of reporting on monitoring programmes 'Biodiversity' descriptors (D1, 4 and 6) have been grouped according to the main species groups and habitat types: D1, 4 and 6 — Birds, D1, 4 and 6 — Mammals and reptiles, D1, 4 and 6 — Fish and cephalopods, D1, 4 and 6 — Seabed habitats, D1, 4 and 6 — Water column habitats. Note that Decision 2010/477/EU has now been repealed and replaced by Commission Decision (EU) 2017/848 of 17 May

ease of reading, the descriptor-specific conclusions related to the seven Member States are highlighted in italics.

For each of these descriptors, Part B of this Staff Working Document draws conclusions on the overall strengths and weaknesses of the programmes of measures submitted by the seven Member States, and provides some recommendations to be considered in view of the next update of such programmes, or for other parts of their national marine strategy, as appropriate.

Methodology: Member States’ programmes of measures were assessed based on the information reported by the Member States and by considering whether the proposed measures are suitable for addressing the relevant pressures, to enable the relevant Member States to move closer towards achieving good environmental status (GES) within the timeline set by the MSFD. In this assessment, the programme of measures either addresses, partially addresses or does not address the needs required to meet the MSFD targets and achieve GES, including its timeline. The outcome of the assessment is therefore partly dependent on the ambition level of the Member State’s determination of its GES and targets. This Staff Working Document further develops the assessment of the main components of Member States’ programmes in relation to the pressures reported. It moreover looks at the exceptions applied by Member States and provides a technical opinion on their plausibility.

A. MSFD descriptor-specific conclusions and recommendations

1. DESCRIPTOR 2 — NON-INDIGENOUS SPECIES

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Partially addressed	Based on the information reported, shipping (through ballast water management) appears to be addressed. It is unclear which pathways are targeted by the other measures and whether shipping is addressed via anti-fouling measures.
	EE	<i>Partially addressed</i>	<i>Only shipping in terms of ballast water is covered. No measure seems to address biofouling. Other activities, such as fishing and tourism, are covered by measures with indirect effects on the pressures.</i>

2017 laying down criteria and methodological standards on good environmental status of marine waters and specifications and standardised methods for monitoring and assessment, and repealing Decision 2010/477/EU (OJ L 125, 18.5.2017, p. 43).

Region	Member State	Assessment against pressures	Explanation
			<i>Aquaculture, an activity reported as relevant by a majority of the neighbouring Member States, is not addressed by Estonia, but based on the information reported, this activity does not take place in its territory.</i>
	LV	Partially addressed	Aquaculture is addressed. Shipping is addressed indirectly and in the future. Latvia reports that the specific measures to reduce non-indigenous species introductions through shipping will be determined once the BWMC is ratified and implemented, which is not yet done. Several measures focus on monitoring activities. These are more relevant to the MSFD monitoring programmes (Article 11).
	LT	Partially addressed	<i>Shipping (ballast waters and biofouling) is addressed, but no measures specifically cover port operations and tourism/recreation (except through some general measures).</i>
	PL	Addressed	Aquaculture and shipping (ballast water management and anti-fouling efforts) are addressed. Poland also addressed agriculture, which it considers relevant to its marine waters.
	DE	Addressed	Aquaculture, shipping, and fisheries are addressed.
	DK	Partially addressed	<i>The measures cover shipping (ballast waters) and aquaculture. Fisheries and recreational yachting are also addressed. Biofouling is only covered by monitoring actions that only have indirect effects on the pressure.</i>
	SE	Partially addressed	Aquaculture and shipping are addressed. Regarding shipping, while ballast water management measures are reported; anti-fouling measures do not appear to be included in the Swedish programme.
North-East Atlantic Ocean	SE	Partially addressed	Aquaculture and shipping are addressed. Regarding shipping, while ballast water management measures are reported; anti-fouling measures do not appear to be included in the Swedish programme.
	DK	Partially addressed	<i>The measures cover shipping (ballast waters) and aquaculture. Fisheries and recreational yachting are also addressed. Biofouling is only covered by monitoring actions that only have indirect effects on the pressure.</i>
	DE	Addressed	Aquaculture, shipping and fishing are addressed.

Region	Member State	Assessment against pressures	Explanation
	NL	Addressed	Aquaculture and shipping are addressed.
	BE	Partially addressed	Shipping is addressed. Aquaculture, which is identified as a relevant activity contributing to non-indigenous species by Belgium, is not covered by the reported measures.
	UK	Addressed	Aquaculture, shipping and recreational boating are addressed.
	IE	Addressed	Aquaculture and shipping are addressed.
	FR	Addressed	Aquaculture, shipping and fishing are addressed.
	ES	Addressed	Aquaculture, fisheries and shipping are addressed. They also include a measure implementing an early detection and warning system in national parks, and efforts in defining guidelines on artificial reefs.
	PT	Not addressed	Aquaculture and shipping are not addressed. The measures are either very general or focus on establishing monitoring programmes and modelling. None of the measures directly target pressures. There are no measures in relation to ballast water management, nor for anti-fouling.
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Shipping (ballast water management) is addressed. Tourism and recreational activities, which are identified as relevant activities in the United Kingdom's Article 8 report, do not appear to be covered.
	ES	Addressed	Aquaculture, shipping, fisheries and tourism/recreation are addressed.
	FR	Partially addressed	Aquaculture, shipping, and fishing are addressed. In the case of shipping, while ballast water management measures are explicitly reported, it is not clear if biofouling is covered.
	IT	Addressed	Aquaculture, fisheries and shipping are addressed.
	MT	Addressed	Aquaculture, shipping, and recreational yachting are addressed.
	HR	Partially addressed	<i>Aquaculture and shipping (ballast water and fouling) are covered but it is unclear whether or not tourism/recreational activities are covered. They might be addressed through shipping-related measures, but this cannot be confirmed from the information provided.</i>
	SI	Partially addressed	<i>Shipping and aquaculture have been reported in Article 8 as the most relevant pathways of non-indigenous species introduction in Slovenia's marine waters. While aquaculture is covered by the</i>

Region	Member State	Assessment against pressures	Explanation
			<i>measures, only ballast water is addressed by the measure relating to shipping activities. It is not clear whether hull-fouling is covered.</i>
	EL	Partially addressed	<i>Although aquaculture and shipping, including ballast water management, are covered, biofouling is not addressed. Tourism/recreational activities, which are reported as a relevant activity by some neighbouring Member States, are only partially covered by an awareness-raising initiative.</i>
	CY	Partially addressed	Fisheries and aquaculture impacts are addressed. No measures address shipping and land claim/coastal defence, which were reported in Cyprus' Article 8 as the main pathways of non-indigenous species introductions into its waters.
Black Sea	BG	Addressed	Aquaculture and shipping (ballast water management and anti-fouling) are addressed.
	RO	Addressed	<i>Shipping is covered. The measures also cover additional pathways for non-indigenous species introductions, such as fisheries and aquaculture.</i>

Table 1 Assessment conclusions of coverage of pressures by Member States for non-indigenous species

2. DESCRIPTOR 3 — COMMERCIAL FISH AND SHELLFISH

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	EE	Partially addressed	<i>Commercial fisheries are addressed. Seaweed harvesting is not addressed and it is not clear whether recreational fishing is fully covered.</i>
	LV	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	LT	Partially addressed	<i>Measures address fisheries in a general manner, while the Common Fisheries Policy (CFP) in itself is not listed among the measures. It is not clear whether or not recreational fisheries will be fully addressed.</i>
	PL	Partially addressed	It addresses commercial fisheries and potentially recreational fisheries. It does not address the activities related to seaweed and other sea-based food harvesting despite Poland having reported these as activities causing the pressure ‘extraction of species’.
	DE	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	DK	Addressed	<i>The measure covers the extraction of species (fish and shellfish), as per its Article 8 reporting, since the measure reported for this descriptor covers fishing activities (both commercial and recreational fishing).</i>
	SE	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
North-East Atlantic Ocean	SE	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.

Region	Member State	Assessment against pressures	Explanation
	DK	Addressed	<i>The measure covers the extraction of species (fish and shellfish), as per its Article 8 reporting, since the measure reported for this descriptor covers fishing activities (both commercial and recreational fishing).</i>
	DE	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities. Aquaculture, which is identified as a relevant activity contributing to extraction of species by Germany in the North Sea, is also covered by the reported measures.
	NL	Addressed	Commercial fishing is addressed, through measures that aim to regulate fishing activities. Due to the limited information provided, it is likely that recreational fishing is addressed, but this cannot be verified.
	BE	Partially addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities. Aquaculture, which is identified as a relevant activity contributing to extraction of species by Belgium, is not covered by the reported measures.
	UK	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	IE	Partially addressed	Extraction of species, fish and shellfish by commercial and recreational fisheries is addressed. The reported pressure extraction of species (seaweed harvesting, maerl, other) does not appear to be covered.
	FR	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	ES	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities. Harvesting of algae (Bay of Biscay and Macaronesia sub-region) is also included.
	PT	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.

Region	Member State	Assessment against pressures	Explanation
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Even though no national fishing fleet exists in Gibraltar, its waters are impacted by illegal fishing, which is not addressed by the programme. Recreational fishing activities are covered.
	ES	Partially addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities. Harvesting of red coral is also addressed. However, given the state of fisheries resources in the Mediterranean, it is not clear whether the management measures represent a sufficient departure from the status quo to address the problem.
	FR	Partially addressed	Measures focused on managing fisheries partially address commercial fisheries and regulate recreational fishing for all relevant species (i.e. measures do not seem to focus on controlling recreational fishing in the Mediterranean as, other than regulations for swordfish and tuna fisheries, recreational fishing is not subject to any register of practitioners, licences, or catch reporting).
	IT	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	MT	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	HR	Partially addressed	<i>The measures cover the most relevant activity, i.e. fisheries. Even though commercial fisheries are covered, it is unclear whether or not recreational fishing is addressed.</i>
	SI	Addressed	<i>The measures focus on the implementation of the CFP and the development of specific regulations on recreational fishing.</i>
	EL	Addressed	<i>The measures address the activities of commercial fisheries, including vessels over 12 m, as per Greece's Article 8 reporting. Recreational fishing is also addressed, although the extent to which this activity is covered is unclear.</i>
	CY	Partially	Commercial fisheries for national stocks and

Region	Member State	Assessment against pressures	Explanation
		addressed	recreational fisheries are addressed. However, Cyprus does not link its programme to the CFP. ⁸ Therefore, it is not clear whether commercial fish species are sufficiently addressed.
Black Sea	BG	Addressed	Commercial and recreational fishing is addressed, through measures that aim to regulate fishing activities.
	RO	<i>Addressed</i>	<i>The measures cover commercial fisheries, including for vessels larger than 12 m, as per its Article 8 reporting. The measures do not explicitly refer to recreational fishing although this activity is still likely to be covered by the measures.</i>

Table 2 Assessment conclusions of coverage of pressures by Member States for D3

⁸ Regulation (EU) No 1380/2013 of the European Parliament and of the Council of 11 December 2013 on the Common Fisheries Policy, amending Council Regulations (EC) No 1954/2003 and (EC) No 1224/2009 and repealing Council Regulations (EC) No 2371/2002 and (EC) No 639/2004 and Council Decision 2004/585/EC, OJ L 354, 28.12.2013, p. 22.

3. DESCRIPTOR 5 — EUTROPHICATION

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Addressed	Agriculture/forestry, urban areas and industry are addressed. The measures also tackle NOx emissions from ships.
	EE	Addressed	<i>The measures cover urban, agricultural and forestry and shipping activities. Three new measures are proposed to help further reduce emissions from shipping, land-based and aquaculture sources. Port operations and industry are addressed.</i>
	LV	Addressed	Agriculture/forestry and urban areas are addressed.
	LT	Addressed	<i>Urban activities and agriculture are covered by several specific measures. Industry does not seem to be covered by specific measures but is very likely to be addressed by general measures targeting various activities or by the national implementation of the Baltic Sea Environmental Protection Strategy. Several links to the regulations of the EU and of the Convention on the Protection of the Marine Environment of the Baltic Sea Area (HELCOM) have been provided.</i>
	PL	Partially addressed	Agriculture, urban areas and industry are addressed, but solid waste disposal and fishing are not (reported as relevant to Polish marine waters by the Member State).
	DE	Addressed	Agriculture/forestry, urban areas, industry and shipping are addressed.
	DK	Addressed	<i>The measures cover agriculture, urban activities (including municipal waste-water discharge) and industry (as reported in Article 8). They also address discharges from shipping and aquaculture.</i>
	SE	Partially addressed	Based on the reporting style of the Member State, existing measures are likely to address several activities (e.g. agriculture and urban areas), yet, based on the information reported, these cannot be identified. New measures will mainly address

Region	Member State	Assessment against pressures	Explanation
			indirect impacts on the marine environment, as they are research and financing measures. As such, the programme is considered to at least partially address pressures.
North-East Atlantic Ocean	SE	Partially addressed	Based on the reporting style of the Member State, existing measures are likely to address several activities (e.g. agriculture and urban areas), yet based on the information reported these cannot be identified. New measures will mainly address indirect impacts on the marine environment, as they are research and financing measures. As such, the programme is considered to at least partially address pressures.
	DK	Addressed	<i>The measures cover agriculture, urban activities (including municipal waste-water discharge) and industry (as reported in Article 8). They also address discharges from shipping and aquaculture.</i>
	DE	Addressed	Agriculture/forestry, urban areas, industry, and shipping are addressed.
	NL	Addressed	Agriculture/forestry, urban areas, industry, and shipping are addressed.
	BE	Partially addressed	Urban areas are addressed. Agriculture and industry do not appear to be covered by the reported measures.
	UK	Partially addressed	Agriculture, urban areas and industry are addressed. Aquaculture, identified as relevant by the United Kingdom in Article 8, does not appear to be addressed via the reported measures.
	IE	Addressed	Agriculture/forestry, urban areas, industry, aquaculture and shipping are addressed.
	FR	Partially addressed	Agriculture, urban areas, shipping and industry are addressed. Aquaculture and recreational activities, identified as relevant by France in Article 8, do not appear to be addressed via the reported measures.
	ES	Partially addressed	Agriculture, urban areas, aquaculture and industry are addressed. Yet fishing, which Spain identified as relevant to its marine waters and contributing to eutrophication, does not appear to be addressed.

Region	Member State	Assessment against pressures	Explanation
	PT	Partially addressed	Agriculture is partly addressed by WFD ⁹ measures and Maritime Spatial Planning (MSP) measures. Other measures aim to identify gaps, share data, and revise monitoring programmes to collect more useful, cost-effective data, etc. These actions will have no direct effects on pressures but rather contribute to increasing knowledge.
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Urban areas, industry and shipping are addressed. However, the United Kingdom is currently planning a sewage treatment plant, without which pressures can be considered partially addressed.
	ES	Partially addressed	Agriculture, urban areas, aquaculture and industry are addressed. Yet fishing, which Spain identified as relevant to its marine waters and contributing to eutrophication, does not appear to be addressed.
	FR	Partially addressed	Agriculture, urban areas, shipping and industry are addressed. Aquaculture and recreational activities, identified as relevant by France in Article 8, do not appear to be addressed via the reported measures.
	IT	Addressed	Agriculture/forestry, industry, tourism, urban areas, aquaculture are addressed.
	MT	Addressed	Agriculture, urban areas, aquaculture and shipping are addressed. It should be noted that in relation to the measure on waste-water, there is currently an open infringement case on the performance of the plants in the framework of the UWWTD. ¹⁰ The contribution of this measure to the MSFD programme and how it can address pressures on the marine environment directly depends on the outcome of this infringement case and if Malta ensures the acceptable performance of the plants.
	HR	Addressed	<i>The measures address aquaculture, agriculture, urban activities and industry. Discharges from shipping and fisheries are also addressed.</i>
	SI	Partially addressed	<i>The measures cover agriculture, urban activities and industry. It is unclear how tourism and</i>

⁹ Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy, OJ L 327, 22.12.2000, p. 1.

¹⁰ Council Directive 91/271/EEC of 21 May 1991 concerning urban waste-water treatment, OJ L 135, 30.5.1991, p. 40.

Region	Member State	Assessment against pressures	Explanation
			<i>aquaculture (despite being reported under Article 8) are covered.</i>
	EL	Addressed	<i>Key activities causing nutrient enrichment identified in Greece's Article 8 reporting, i.e. aquaculture, industry, agriculture and urban waste-water discharge are addressed.</i>
	CY	Addressed	<i>Agriculture, urban areas, industry, aquaculture and shipping are addressed.</i>
Black Sea	BG	Partially addressed	<i>Aquaculture, industry, and shipping are addressed. Based on the reporting style of the Member State, existing measures are likely to address several other activities as well (e.g. agriculture and urban areas), yet based on the information reported these cannot be identified.</i>
	RO	Addressed	<i>Agriculture, urban activities (including municipal waste-water discharge) and industry are covered. The measures address discharges from shipping and also focus on tourism and recreation, port operations and offshore activities.</i>

Table 3 Assessment conclusions of coverage of pressures by Member States for D5

4. DESCRIPTOR 7 — HYDROGRAPHICAL CHANGES

Have the pressures been covered by Member States?

Region	Member State	Assessment against measures	Explanation
Baltic Sea	FI	Addressed	The measures are likely to address most pressures and activities since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA ¹¹ and Strategic Environmental Assessment (SEA) ¹² Directives. The measures also tackle interference with hydrological processes and marine acidification, due to diverse marine activities such as dredging, marine mining (sand, gravel, rock extraction). It should be noted that it is not clear if and how cumulative impacts are addressed.
	EE	Partially addressed	<i>The measure reported by Estonia clearly addresses land claim/coastal defence, as per its Article 8 reporting, whereas industry, port operations, submarine pipeline/cable operations might be covered through measures related to MSP and integrated marine and coastal management. Nevertheless, these measures are not explicitly described and key pieces of legislation (EIA, SEA and the WFD) are not mentioned. It is not clear whether or not cumulative impacts are covered. The measures mainly implement national/EU legislation and HELCOM recommendations.</i>
	LV	Not addressed	The measures reported by Latvia are not D7-specific and do not appear to tackle any relevant pressure / activity. Latvia did not previously report the pressures associated with hydrographical changes as relevant in its Article 8 reporting due to a lack of existing data. As such, the programme does not address relevant D7 pressures.
	LT	Not	<i>Lithuania has not reported any measures for D7.</i>

¹¹ Directive 2014/52/EU of the European Parliament and of the Council of 16 April 2014 amending Directive 2011/92/EU on the assessment of the effects of certain public and private projects on the environment, OJ L 124, 25.4.2014, p. 1.

¹² Directive 2001/42/EC of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment, OJ L 197, 21.7.2001, p. 30.

Region	Member State	Assessment against measures	Explanation
		addressed	<i>Marine hydrocarbon extraction, port operations, and tourism and recreation are not addressed (nor cumulative impacts). They can be covered by measures reported under other descriptors (EIA and SEA, reported for underwater noise and biodiversity but the link between these measures and hydrographical changes has not been explained by Lithuania.</i>
	PL	Partially addressed	The measures are likely to address most pressures and activities since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. However, little detail is provided on the contribution of the measures to address the pressures. The activities of waste disposal, shipping and tourism are not addressed. It should be noted that it is not clear if and how cumulative impacts are addressed.
	DE	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. Germany addresses cumulative impacts, which is positive.
	DK	Addressed	<i>The measures cover land claim and coastal defence, industry and offshore structures through Environmental Impact Assessment (EIA) and permitting processes. It is not clear whether or not the measures address cumulative impacts.</i>
	SE	Addressed	Measures linked to the implementation of MSP and water regulations, as well as the Swedish Planning and Building Act (PBA). The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Even though Sweden did not previously report hydrographical changes (D7) as a pressure on its marine waters (in either of its sub-regions), it defined existing and new measures to tackle this issue. One of the new measures particularly targets urban activities. It should be noted that it is not clear if and how cumulative

Region	Member State	Assessment against measures	Explanation
			impacts are addressed.
North-East Atlantic Ocean	SE	Addressed	Measures linked to the implementation of MSP and water regulations, as well as the Swedish Planning and Building Act (PBA). The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Even though Sweden did not previously report hydrographical changes (D7) as a pressure on its marine waters (in either of its sub-regions), it defined existing and new measures to tackle this issue. One of the new measures particularly targets urban activities. It should be noted that it is not clear if and how cumulative impacts are addressed.
	DK	Addressed	<i>The measures cover land claim and coastal defence, industry and offshore structures through EIA and permitting processes. It is not clear whether or not the measures address cumulative impacts.</i>
	DE	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. Germany addresses cumulative impacts, which is positive.
	NL	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. It should be noted that it is not clear if and how cumulative impacts are addressed.
	BE	Partially addressed	No measures are reported specifically for hydrographical changes (D7). Nevertheless, Belgium reports a WFD measure that may address D7 at the coast (where most hydrographical changes occur), although, given the level of detail reported, this cannot be verified.
	UK	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are

Region	Member State	Assessment against measures	Explanation
			subject to the existing regulatory procedures. Measures refer to the implementation of the EIA Directives. It should be noted that it is not clear if and how cumulative impacts are addressed.
	IE	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA Directives. It should be noted that it is not clear if and how cumulative impacts are addressed.
	FR	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. France addresses cumulative impacts, which is positive.
	ES	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. It should be noted that it is not clear if and how cumulative impacts are addressed.
	PT	Not addressed	Activities causing pressures are not addressed. The reported measures aim to collect data for the parameters relevant for D7 or establish management plans for maritime and coastal activities in order to control pressures in the future.
Mediterranean Sea	UK (Gibraltar)	Addressed	The measures are likely to address most pressures and activities since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA Directives. It should be noted that it is not clear if and how cumulative impacts are addressed.
	ES	Partially addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. Nevertheless, no clear

Region	Member State	Assessment against measures	Explanation
			measure about desalination in the Mediterranean Sea has been reported (an activity identified by Spain as relevant to its Mediterranean waters). It should be noted that it is not clear if and how cumulative impacts are addressed.
	FR	Partially addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. Nevertheless, it is not clear how agriculture and changes in thermal regimes due to discharges from power plants (reported as relevant by France in its Article 8 report) are addressed. France addresses cumulative impacts, which is positive.
	IT	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA Directive. It should be noted that it is not clear if and how cumulative impacts are addressed.
	MT	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA and SEA Directives. It should be noted that it is not clear if and how cumulative impacts are addressed.
	HR	Addressed	<i>Croatia has not identified any pressures and activities related to this descriptor under its Article 8 reporting. Nevertheless, the reported measures — namely those linking to EIA, SEA, MSP and integrated coastal zone management - address all activities that could have an impact on hydrological processes. Cumulative impacts are likely addressed by some of these measures.</i>
	SI	Addressed	<i>The measures cover land claim and coastal defence, and port operations through existing permitting processes. It should be noted that cumulative impacts are likely to be addressed by the reported measures e.g. MSP and integrated</i>

Region	Member State	Assessment against measures	Explanation
			<i>coastal zone management.</i>
	EL	Partially addressed	<i>The measures partially address desalination, industry, agriculture and forestry, and coastal defence, as well as urban waste-water discharge. There is still uncertainty regarding other relevant activities that may be covered through two new cross-cutting measures (e.g. agriculture or industry). In the absence of detailed information on these cross-cutting measures, the extent to which all relevant pressures and activities are addressed is unclear. The addressing of cumulative impacts is similarly unclear.</i>
	CY	Partially addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Still, industrial, coastal defence and port activities are only covered by one horizontal measure linked to EIAs and SEAs, but no specific D7 measure has been reported to address these activities. Measures refer to the implementation of the EIA and SEA Directives. Desalination activities are also addressed. It should be noted that it is not clear if and how cumulative impacts are addressed.
Black Sea	BG	Addressed	The measures are likely to address most pressures and activities, since all projects which could adversely impact hydrological conditions are subject to the existing regulatory procedures. Measures refer to the implementation of the EIA Directive. It should be noted that it is not clear if and how cumulative impacts are addressed.
	RO	Addressed	<i>The measures focus on licensing and permitting processes (linked directly with EIA and SEA), although this is done through horizontal measures and not D7-specific measures. It should be noted that cumulative impacts are likely to be addressed by the reported measures, although not expressly cited (e.g. SEA, MSP). The single D7-specific measure covers coastal defence and dredging.</i>

Table 4 Assessment conclusions of coverage of pressures by Member States for D7

5. DESCRIPTORS 8 & 9 — CONTAMINANTS AND CONTAMINANTS IN SEAFOOD

Have the pressures been covered by Member States? (D8 — contaminants)

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Addressed	Industry, urban activities, and agriculture/forestry as sources of hazardous compounds are addressed. Although no specific measures have been defined to address accidental pollution due to industry and urban activities (which are identified by Finland as relevant activities contributing to the pressure in their Article 8 reporting), these activities associated with this pressure are likely to be covered by existing measures on the introduction of hazardous compounds through urban and industrial activities. Some further measures also relating to shipping and accidental pollution are reported.
	EE	Addressed	<i>For the introduction of synthetic and non-synthetic compounds, industry, urban and shipping activities are covered. For acute pollution events, Estonia's programme addresses marine-based renewable energy generation, dredging, industry, port operations, submarine cable/pipeline operations and shipping. Although no measure specifically addresses marine-based renewable energy generation as well as submarine cable/pipeline operations, they are very likely to be covered by general measures targeting various activities.</i>
	LV	Addressed	Industry and urban activities, as sources of hazardous compounds, as well as shipping and port operations, as responsible for accidental pollution, are addressed.
	LT	Addressed	<i>The introduction of synthetic and non-synthetic compounds through port operations, shipping, urban activities and solid waste disposal are specifically covered. Some measures also concern industry, dredging, agriculture, and marine hydrocarbon extraction. Shipping in relation to acute pollution events is explicitly addressed. It is very likely that the measures concerning port operations in general will contribute to improve the management of acute pollution events as well.</i>

Region	Member State	Assessment against pressures	Explanation
	PL	Addressed	Industry and urban activities, as sources of hazardous compounds, are addressed. Agriculture is also covered. Accidental pollution is also addressed through measures targeting shipping.
	DE	Addressed	Agriculture, as a source of synthetic compounds, and shipping, responsible for accidental pollution, is addressed. Various other activities are also covered (e.g., marine mining or urban activities).
	DK	Addressed	<i>For the introduction of synthetic and non-synthetic compounds, the measures cover industry, urban activities, shipping, agriculture and marine hydrocarbon extraction through commitments to the WFD, Convention for the Protection of the marine environment of the North-East (OSPAR), HELCOM and Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), for example. For acute pollution events, Denmark addresses port operations, submarine cables and pipeline, shipping and marine hydrocarbon extraction.</i>
	SE	Partially addressed	Industry and urban activities as sources of non-synthetic compounds and shipping responsible for accidental pollution are addressed. Agriculture, another source of non-synthetic compounds, does not appear to be covered by the reported measures. It could be addressed by the general measures (which do not specify which activities they address), but this cannot be verified based on the information reported.
North-East Atlantic	SE	Partially addressed	Industry and urban activities as sources of non-synthetic compounds and shipping responsible for accidental pollution are addressed. Agriculture, another source of non-synthetic compounds, does not appear to be covered by the reported measures. It could be addressed by the general measures (which do not specify which activities they address), but this cannot be verified based on the information reported.
	DK	Addressed	<i>For the introduction of synthetic and non-synthetic compounds, the measures cover industry, urban activities, shipping, agriculture and marine hydrocarbon extraction through commitments to the WFD, OSPAR, HELCOM and REACH, for</i>

Region	Member State	Assessment against pressures	Explanation
			<i>example. For acute pollution events, Denmark addresses port operations, submarine cables and pipeline, shipping and marine hydrocarbon extraction.</i>
	DE	Addressed	Industry, agriculture, urban activities and shipping, as sources of hazardous compounds, are addressed. Accidental pollution is also addressed through measures targeting urban areas and shipping.
	NL	Addressed	Industry, agriculture, urban activities and shipping as sources of hazardous compounds, as well as marine hydrocarbon extraction and shipping, as responsible for accidental pollution, are addressed.
	BE	Addressed	Marine-based renewable energy generation, as responsible for accidental pollution, as well as shipping as both a source of hazardous compounds and accidental pollution are addressed.
	UK	Addressed	Industry, tourism/recreational activities (probably associated with shipping) and shipping, as sources of hazardous compounds, as well as marine hydrocarbon extraction and shipping, as responsible for accidental pollution, are addressed.
	IE	Addressed	Industry, urban activities and shipping, as sources of hazardous compounds, as well as fisheries and shipping, as responsible for accidental pollution, are addressed. Several other activities are covered such as aquaculture.
	FR	Addressed	Industry, agriculture, urban activities, port operations and solid waste disposal, as sources of hazardous compounds, as well as dumping of munitions and shipping, other sources of both hazardous compounds and accidental pollution, are addressed.
	ES	Addressed	Industry, agriculture, urban activities, port operations and shipping, as sources of hazardous compounds, as well as industry, port operations and shipping, as responsible for accidental pollution, are addressed.
	PT	Partially addressed	Shipping, as the main source of hazardous compounds, is addressed. Marine hydrocarbon extraction, as responsible for accidental pollution, is not addressed. Riverine discharge and atmospheric deposition are not addressed.

Region	Member State	Assessment against pressures	Explanation
			Accidental pollution is addressed through measures targeting shipping.
Mediterranean Sea	UK (Gibraltar)	Addressed	Industry, agriculture, and shipping (point and diffuse discharges), as sources of hazardous compounds and accidental pollution, are addressed.
	ES	Addressed	Industry, agriculture, urban activities, port operations and shipping, as sources of hazardous compounds, as well as marine hydrocarbon extraction, industry, port operations and shipping, as responsible for accidental pollution, are addressed.
	FR	Addressed	Industry, agriculture, urban activities, port operations and solid waste disposal, as sources of hazardous compounds, as well as dumping of munitions and shipping, other sources of both hazardous compounds and accidental pollution, are addressed. Pollution coming from shipwrecks is also covered.
	IT	Partially addressed	Industry and offshore structures as sources of hazardous compounds are covered. However, other sources of contaminants, such as urban activities and port operations, reported by neighbouring Member States as important sources of pressures, do not appear to be covered. Accidental pollution is addressed.
	MT	Addressed	Industry and urban activities, as well as desalination/water abstraction and aquaculture, as sources of hazardous compounds, as well as industry, port operations and shipping, as responsible for accidental pollution, are addressed. Other activities, such as marine hydrocarbon extraction, are covered.
	HR	Addressed	<i>For the introduction of synthetic and non-synthetic compounds, industry, agriculture, shipping and urban activities are covered. Fisheries, aquaculture, tourism and recreational activities are also addressed. Croatia does not report accidental pollution (acute pollution events) in its Article 8 reporting but still defined an existing measure addressing this pressure.</i>
	SI	Addressed	<i>For the introduction of synthetic and non-synthetic compounds, industry, agriculture,</i>

Region	Member State	Assessment against pressures	Explanation
			<i>tourism/recreational activities, shipping and urban activities are covered. For acute pollution events, industry, tourism/recreational activities and shipping are addressed.</i>
	EL	<i>Partially addressed</i>	<i>For the introduction of synthetic and non-synthetic compounds, marine hydrocarbon extraction, industry, agriculture, aquaculture, shipping and urban activities are covered either by measures specifically addressing these activities or by general measures. However, marine mining (reported under Article 8) does not seem to be covered by any measure. For acute pollution events, shipping, as well as marine hydrocarbon extraction, fisheries and port operation are addressed.</i>
	CY	Addressed	Industry, agriculture, and urban activities, as sources of hazardous compounds, as well as shipping, another source of hazardous compounds and accidental pollution, are addressed.
Black Sea	BG	Partially addressed	Industry, agriculture, and urban activities, as sources of hazardous compounds, are addressed. Port operations and shipping as responsible for accidental pollution are addressed. Industry, another source of accidental pollution, is not addressed.
	RO	<i>Partially addressed</i>	<i>Industry, urban activities, shipping, and solid waste disposal reported as sources of synthetic and non-synthetic compounds are addressed, while marine hydrocarbon extraction is not. Shipping, reported as a source of accidental pollution, is covered by the measures but industry and urban activities are not. These are however likely to be covered by measures addressing these same activities as sources of contaminants but this cannot be confirmed from the information provided. For both pressures, the measures also cover agriculture and port operations.</i>

Table 5 Assessment conclusions of coverage of pressures by Member States for D8

Have the pressures been covered by Member States? (D9 — contaminants in seafood)

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Addressed	Finland reports the same set of measures for D8 and D9. Industry, urban activities, and agriculture/forestry as sources of hazardous compounds are addressed. Although no specific measures have been defined to address accidental pollution due to industry and urban activities (which are identified by Finland as relevant activities contributing to the pressure in their Article 8), these activities associated with this pressure are likely to be covered by existing measures on the introduction of hazardous compounds through urban and industrial activities. Some further measures also relating to shipping are reported.
	EE	Addressed	<i>Estonia reports the same set of measures for D8 and D9. For the introduction of synthetic and non-synthetic compounds, industry, urban and shipping activities are covered. For acute pollution events, Estonia's programme addresses marine-based renewable energy generation, dredging, industry, port operations, submarine cable/pipeline operations and shipping. Although no measure specifically addresses marine-based renewable energy generation as well as submarine cable/pipeline operations, they are very likely to be covered by general measures targeting various activities.</i>
	LV	Addressed	Latvia reports the same set of measures for D8 and D9. Industry, urban activities, as well as shipping and port operations are addressed.
	LT	Addressed	<i>The introduction of synthetic and non-synthetic compounds through port operations, shipping, urban activities and solid waste disposal are specifically covered. Some measures also concern industry, dredging, agriculture, and marine hydrocarbon extraction. Shipping in relation to acute pollution events is explicitly addressed. It is very likely that the measures concerning port operations in general will contribute to improve the management of acute pollution events as well.</i>
	PL	Addressed	Poland reports the same set of measures for D8 and D9, in addition to some D3 and D10 measures. Industry and urban activities are addressed. Other

Region	Member State	Assessment against pressures	Explanation
			activities are also covered, such as agriculture and fisheries as relevant sources of hazardous compounds.
	DE	Addressed	Agriculture and shipping are addressed when combined with the D8 programme. The D9 programme addresses the key pressures but only focuses on the dumping of munitions and does not cover additional activities.
	DK	Addressed	<i>The measures reported under D9 specifically focus on industrial and urban activities (releasing dioxins) and fisheries (trimming of fat). Denmark specifies that the measures reported for D8 are also relevant for D9.</i>
	SE	Partially addressed	Sweden reports the same set of measures for D8 and D9. Industry, urban activities and shipping are addressed. Agriculture does not appear to be covered by the reported measures. It could be addressed by the general measures (which do not specify which activities they address), but this cannot be verified based on the information reported.
North-East Atlantic Ocean	SE	Partially addressed	Sweden reports the same set of measures for D8 and D9. Industry, urban activities and shipping are addressed. Agriculture does not appear to be covered by the reported measures. It could be addressed by the general measures (which do not specify which activities they address), but this cannot be verified based on the information reported.
	DK	Addressed	<i>The measures reported under D9 specifically focus on industrial and urban activities (releasing dioxins) and fisheries (trimming of fat). Denmark specifies that the measures reported for D8 are also relevant for D9.</i>
	DE	Addressed	Industry, agriculture, urban areas and shipping are addressed when combined with the D8 programme. The D9 programme addresses the key pressures but only focuses on the dumping of munitions and does not cover additional activities.
	NL	Addressed	Industry, agriculture, urban activities and shipping as well as marine hydrocarbon extraction are addressed, when combined with the D8 programme. The D9-related measure does not

Region	Member State	Assessment against pressures	Explanation
			make reference to any specific human activity.
	BE	Addressed	Marine-based renewable energy generation and shipping are addressed, when combined with the D8 measures. Most of the measures in the D9 programme have indirect effects on the D9-related pressure because they are either monitoring or governance measures that focus on fisheries, except one direct measure that only targets recreational fishing.
	UK	Addressed	Industry, tourism/recreational activities (probably associated with shipping) and shipping, as well as marine hydrocarbon extraction are addressed.
	IE	Addressed	Industry, urban activities and shipping are addressed, as well as fisheries.
	FR	Addressed	Industry, agriculture, urban activities, port operations and solid waste disposal, as well as dumping of munitions and shipping, are addressed, when combined with the D8 programme.
	ES	Addressed	Spain reports the same set of measures for D8 and D9, except one existing D9-specific measure. Industry, agriculture, urban activities, port operations and shipping are addressed.
	PT	Partially addressed	Shipping is addressed, when combined with the D8 programme. Marine hydrocarbon extraction is not addressed.
Mediterranean Sea	UK (Gibraltar)	Addressed	The United Kingdom reports the same set of measures for D8 and D9. Industry, agriculture and shipping (point and diffuse discharges) are addressed. Even though Gibraltar has no fishing fleet, it conducts tests on imported seafood, as required under other EU legislation as well as to meet D9 objectives.
	ES	Addressed	Spain reports the same set of measures for D8 and D9, except one existing D9-specific measure. Industry, agriculture, urban activities, port operations and shipping, as well as marine hydrocarbon extraction, are addressed.
	FR	Addressed	Industry, agriculture, urban activities, port operations and solid waste disposal, as well as dumping of munitions and shipping, are addressed, when combined with the D8 programme.
	IT	Partially Addressed	Industry and offshore structures are addressed, when combined with the D8 programme. The D9

Region	Member State	Assessment against pressures	Explanation
			programme includes several measures to tackle the issue of contaminants, targeting several sources such as aquaculture (through the D9-specific measures), agriculture, industry and shipping (through measures also relevant for D8). Even though offshore structures are not covered by any D9 measure, it is still likely to be addressed by D8-related measures. However, other sources of contaminants, such as urban activities and port operations, reported by neighbouring Member States as important sources of pressures, do not appear to be covered.
	MT	Addressed	Industry, urban activities, desalination/water abstraction and aquaculture, as well as port operations and shipping, are addressed, when combined with the D8 programme. The measures address the relevant pressures as they will ensure the identification of potential risk of contaminated seafood and notification of the competent authorities. Concentration levels in marine water are addressed under D8 and will contribute towards reducing pressures under D9.
	HR	Addressed	<i>Some measures focus on pollutants in biota and the bio-accumulation of pollutants, as well as toxic and genotoxic effects of pollutants on organisms. Some monitoring programmes can also be useful to control the level of pollutants in biota.</i>
	SI	Addressed	<i>Combined with those defined for D8, the measures address the relevant pressures, as they will ensure the monitoring and identification of potential seafood contamination risks. Concentration levels in marine water are addressed under D8 and will contribute towards reducing pressures under D9.</i>
	EL	Addressed	<i>The measures focus on fisheries and aquaculture. Other measures cover monitoring and research, and indirectly contribute to addressing the pressures.</i>
	CY	Addressed	Industry, agriculture, urban activities and shipping are addressed when combined with the D8 programme. A D9-specific measure has been defined to address contaminants in seafood (it does not focus on a specific activity).
Black Sea	BG	Partially	Industry, agriculture, urban activities, port

Region	Member State	Assessment against pressures	Explanation
		addressed	operations and shipping, as sources of hazardous compounds, are addressed when combined with the D8 programme. Industry as responsible for accidental pollution is not addressed.
	RO	<i>Partially addressed</i>	<i>Industry, urban activities and shipping are covered but marine hydrocarbon extraction is not. Aquaculture is specifically addressed by the measure defined for D9.</i>

Table 6 Assessment conclusions of coverage of pressures by Member States for D9

6. DESCRIPTOR 10 — MARINE LITTER

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Addressed	Fisheries, tourism/recreational activities and shipping are addressed. Micro-litter is also addressed.
	EE	Addressed	<i>Shipping and tourism/recreational activities are addressed. New measures also cover fisheries and port operations, as well as awareness-raising efforts for the public and waste management plans (that include land-based sources of litter). Even though micro-litter is not covered yet by any measure, it is recognised as an important source of pressure by Estonia, which has set up pilot monitoring regarding it.</i>
	LV	Addressed	Even though marine litter has not been reported as a pressure in Latvia's Article 8 report, the retail sector, tourism/recreation activities and shipping are addressed. Micro-litter is indirectly addressed.
	LT	Addressed	<i>Fisheries, port operations, tourism and shipping, as well as urban and industrial activities (both sea-based and land-based sources of litter) are addressed and a comprehensive approach (including for example bathing water quality and waste/surface water management) is reflected. The measures are linked to the implementation of the Baltic Sea Action Plan and Regional Plan against marine litter. Micro-litter is not addressed.</i>
	PL	Addressed	Tourism/recreational activities are addressed. Several other activities are covered (e.g. port operations or urban activities). Micro-litter is indirectly addressed.
	DE	Addressed	Industry, tourism/recreational activities, and shipping are addressed. Micro-litter is also addressed through measures on urban activities (municipal waste-water discharge).
	DK	Addressed	<i>Although Denmark did not identify any pressures or activities related to marine litter in its Article 8 reporting, measures address marine litter from several activities, such as shipping, tourism, and fisheries. Micro-litter is addressed mainly</i>

Region	Member State	Assessment against pressures	Explanation
			<i>indirectly.</i>
	SE	Partially addressed	Fisheries and shipping are addressed. Tourism/recreational activities might be targeted indirectly (mainly through measures against littering), although no specific measures focusing on these activities have been reported. Micro-litter is also addressed through measures on industry (discharges, emissions, cosmetics) and urban activities (municipal waste-water discharge).
North-East Atlantic Ocean	SE	Partially addressed	Fisheries and shipping are addressed. Tourism/recreational activities might be targeted indirectly (mainly through measures against littering), although no specific measure focusing on these activities have been reported. Micro-litter is also addressed through measures on industry (discharges, emissions, cosmetics) and urban activities (municipal waste-water discharge).
	DK	Addressed	<i>Although Denmark did not identify any pressures or activities related to marine litter in its Article 8 reporting, measures address marine litter from several activities, such as shipping, tourism, and fisheries. Micro-litter is addressed mainly indirectly.</i>
	DE	Addressed	Fisheries, offshore structures, and shipping are addressed. Micro-litter is addressed through measures on several activities, including urban ones (sewage treatment plants).
	NL	Addressed	Fisheries, tourism/recreational activities, and shipping are addressed. Micro-litter is addressed through measures on industry (cosmetic).
	BE	Addressed	Fisheries, tourism/recreational activities and shipping are addressed. Micro-litter is indirectly addressed.
	UK	Addressed	Fisheries, industry, and tourism/recreational activities are covered. It is not clear if micro-litter is addressed (no data).
	IE	Addressed	Fisheries, urban, tourism/recreational activities and shipping are addressed. Micro-litter is directly addressed by a measure on the implementation of the UWWTD and also indirectly.
	FR	Addressed	Fisheries, aquaculture, industry, urban, port operations, tourism/recreational activities and shipping are addressed. These measures will also

Region	Member State	Assessment against pressures	Explanation
			address micro-litter from secondary sources (that derive from the degradation of products during their lifecycle or from the degradation of macro-litter).
	ES	Addressed	Fisheries, aquaculture, urban, tourism/recreational activities, and shipping are addressed. Micro-litter is addressed through measures on industry (discharges, emissions).
	PT	Partially addressed	Fisheries, port operations and shipping are addressed. Urban areas and tourism are not addressed. It is not clear if micro-litter is addressed (no data).
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Urban, industry, tourism/recreational activities and shipping are addressed. Micro-litter is likely to be addressed.
	ES	Addressed	Fisheries, urban, tourism/recreational activities, and shipping are addressed. Micro-litter is addressed through measures on industry (discharges, emissions).
	FR	Addressed	Fisheries, aquaculture, industry, urban, port operations, tourism/recreational activities and shipping are addressed. Even though fisheries, aquaculture and shipping do not seem to be covered by specific measures in the Western Mediterranean Sea, these activities are very likely to be addressed by the measures targeting various sectors (that have not been specified in the reported measures). These measures also address micro-litter from secondary sources (that derive from the degradation of products during their lifecycle or from the degradation of macro-litter).
	IT	Partially addressed	Fisheries, urban activities and shipping are addressed. Tourism/recreational activities are indirectly addressed. Micro-litter is addressed.
	MT	Addressed	Fisheries, tourism/recreational activities, and shipping are addressed. Malta also addresses dredging, which it considers relevant to its marine waters. It is not clear if micro-litter is addressed (no data).
	HR	Addressed	<i>Even though Croatia does not report marine litter as a relevant pressure on its marine waters, the measures still cover fisheries, port operations and shipping. Micro-litter is covered by one specific</i>

Region	Member State	Assessment against pressures	Explanation
			<i>measure. Urban activities are only covered by an indirect measure and tourism/recreational activities do not seem to be addressed.</i>
	SI	Addressed	<i>Slovenia's measures cover fisheries, aquaculture and urban activities, as well as tourism, shipping and port operations.</i>
	EL	Addressed	<i>The existing and new measures cover both land-based and sea-based sources of litter: fisheries, urban activities, tourism/recreational activities, and shipping, as well as additional activities such as industry. There is no reference to the United Nations Environment Programme / Mediterranean Action Plan (UNEP/MAP) regional plan for marine litter.</i>
	CY	Partially addressed	<i>Urban and tourism/recreational activities are addressed. Industry and shipping are not addressed. It is not clear if micro-litter is addressed (no data).</i>
Black Sea	BG	Addressed	<i>Fisheries, urban activities, and shipping are addressed. It is not clear if micro-litter is addressed (no data).</i>
	RO	Addressed	<i>Fisheries, tourism and shipping are covered. In addition, the measures address 'micro-plastics', as well as port operations. Even though Romania recognises that the Danube River has an important influence on the ecological status of the Black Sea marine ecosystem, no measure reported under D10 focuses on the Danube. This is a gap in the Romanian marine strategy regarding marine litter.</i>

Table 7 Assessment conclusions of coverage of pressures by Member States for D10

7. DESCRIPTOR 11 — UNDERWATER NOISE AND ENERGY

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Partially addressed	Shipping is addressed. Port operations are indirectly addressed.
	EE	Addressed	<i>The measures cover port operations and shipping. Marine-based renewable energy generation, which was reported by most of the other Baltic Sea countries, does not currently occur in Estonia's marine waters.</i>
	LV	Partially addressed	The programme includes one indirect measure. Latvia does not report underwater noise as a pressure on its marine waters, and does not report measures that will directly contribute to decreasing the pressure. Nevertheless, the reported research measure will contribute to addressing knowledge gaps for this descriptor. Still, most of the neighbouring Member States report marine-based renewable energy and shipping as key activities contributing to underwater noise.
	LT	Partially addressed	<i>Shipping is directly addressed. The measures with broader impacts also cover dredging and port operations. No specific measure seems to cover marine-based renewable energy generation, fisheries and submarine cable and pipeline operations, which were reported under Article 8. Most measures cover many activities but do not address specific ones reported by Lithuania under Article 8.</i>
	PL	Partially addressed	Shipping is addressed. Marine-based renewable energy generation and fisheries are only covered by licensing and EIA measures and most new measures are indirect. While the reported measures do not yet directly address the pressures, they contribute to better characterising them, understanding risks and to the work of defining thresholds at the EU/ (sub) regional level.
	DE	Addressed	Marine-based renewable energy generation, marine hydrocarbon extraction, marine mining, tourism/recreational activities and shipping are addressed. Heat and light inputs are also addressed through measures on marine based renewable

Region	Member State	Assessment against pressures	Explanation
			energy generation, industry, submarine cable/pipeline operations and offshore activities.
	DK	Addressed	<i>The measures cover activities related to marine-based renewable energy generation operations, as well as marine research, survey and educational activities. 'Detonation of dumped munition at sea' is reported under Article 8, however, Denmark ensures that it does not dump munitions; besides, some measures focus on military activities. Other additional activities not reported under Article 8, such as marine mammal behaviour around offshore oil and gas installations, are also covered by the programme.</i>
	SE	Partially addressed	Marine based renewable energy generation, fisheries, offshore activities, marine research and shipping are indirectly addressed through efforts to increase knowledge and coordination actions. These will contribute to better understanding the pressures.
North-East Atlantic Ocean	SE	Partially addressed	Marine-based renewable energy generation, fisheries, marine research and shipping are indirectly addressed through efforts to increase knowledge and coordination actions. These will contribute to better understanding the pressures.
	DK	Addressed	<i>The measures cover activities related to marine-based renewable energy generation operations, as well as marine research, survey and educational activities. 'Detonation of dumped munition at sea' is reported under Article 8, however, Denmark ensures that it does not dump munitions; besides, some measures focus on military activities. Other additional activities not reported under Article 8, such as marine mammal behaviour around offshore oil and gas installations, are also covered by the programme.</i>
	DE	Addressed	Marine-based renewable energy generation, marine hydrocarbon extraction, fisheries, marine mining, marine research and shipping are addressed. Heat and light inputs are also addressed through measures on marine-based renewable energy generation, industry, submarine cable/pipeline operations and offshore activities.
	NL	Addressed	Marine-based renewable energy generation, marine

Region	Member State	Assessment against pressures	Explanation
			hydrocarbon extraction, offshore structures, marine research and shipping are addressed. Light inputs are also addressed through measures targeting offshore activities.
	BE	Partially addressed	Marine-based renewable energy generation is addressed. Shipping is indirectly addressed by a measure that develops communication and awareness raising effort.
	UK	Partially addressed	Marine-based renewable energy generation, marine hydrocarbon extraction, dredging, land claim/coastal defence and shipping are addressed. Marine research (impulsive noise) is not addressed. Continuous underwater noise may also not be yet fully covered.
	IE	Addressed	Marine hydrocarbon extraction, fisheries, dredging, marine research and shipping are addressed. Fisheries and dredging are likely to be covered by various measures covering EIA and guidance documents.
	FR	Addressed	Marine mining, offshore activities, marine research and shipping are addressed. Marine-based renewable energy generation is also covered by the completely new D11 measure.
	ES	Partially addressed	Submarine cable/pipelines, recreational activities (linked to shipping), marine research and shipping are addressed. Fisheries are only indirectly addressed through a measure that aims to raise awareness about various pressures on the marine environment. Marine hydrocarbon extraction, port operations and solid waste disposal are not addressed.
	PT	Partially addressed	The programme includes one D11-specific indirect measure, two other new indirect measures that are also relevant for other descriptors and eight horizontal new measures. While the reported measures do not yet directly address any pressures, they contribute to better characterising pressures, understanding risks and defining thresholds at the EU/sub divisional level.
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Maintenance dredging is addressed. Tourism/recreational activities and shipping are not addressed. EIA and AA measures will contribute to reducing noise pressures, but they will not be

Region	Member State	Assessment against pressures	Explanation
			sufficient to cover noise impacts from all activities within the region.
	ES	Partially addressed	Submarine cable/pipelines, recreational activities (linked to shipping), marine research and shipping are addressed. Fisheries are only indirectly addressed through a measure that aims to raise awareness about various pressures on the marine environment. Marine hydrocarbon extraction, port operations and solid waste disposal are not addressed.
	FR	Addressed	Port operations, marine research and shipping are addressed.
	IT	Addressed	Marine hydrocarbon extraction, marine research and shipping are addressed. Both impulsive and continuous noises are covered.
	MT	Partially addressed	Marine hydrocarbon exploration and extraction is addressed (impulsive noise). Shipping is not addressed (continuous noise).
	HR	Not addressed	<i>The measures reported by Croatia only have indirect impacts (development of a register of impulsive noise, monitoring efforts for continuous noise and governance efforts).</i>
	SI	Addressed	<i>Slovenia's measures cover land claim/coastal defence, port operations (both with only local impact), tourism/recreation (including yachting) and shipping as activities causing underwater noise.</i>
	EL	Addressed	<i>Shipping, hydrocarbon extraction and marine research are covered by the new measures.</i>
	CY	Partially addressed	Marine hydrocarbon extraction is addressed. Fisheries, industry, tourism/recreational activities, marine research and shipping are not addressed.
Black Sea	BG	Partially addressed	Marine hydrocarbon extraction is addressed. Dredging, land claim/coastal defence, port operations, tourism/recreational activities and shipping are indirectly addressed through measures on data collection for monitoring purposes and filling knowledge gaps. While one of the reported measures does not directly address the pressures, it contributes to better characterising them, understanding risks and defining thresholds at the EU/(sub)regional level.
	RO	Partially	<i>Romania did not identify any pressures or activities</i>

Region	Member State	Assessment against pressures	Explanation
		<i>addressed</i>	<i>in its Article 8 reporting, but several activities, particularly shipping, fishing and tourism (and port operation to some extent), are addressed by a measure which has both direct and indirect effects. Another measure, on the development of an impulsive noise register, only has indirect impacts on the pressure.</i>

Table 8 Assessment conclusions of coverage of pressures by Member States for D11

8. DESCRIPTORS 1, 4, 6 — BIODIVERSITY

i. D1, 4 Birds

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Addressed	By-catch from fisheries is addressed. Spatial protection and MSP measures will reduce pressures on bird habitats.
	EE	<i>Not addressed</i>	<i>The general measures (not specific for birds) do not focus on any specific pressure (except contaminants to some extent) or activity but only provide spatial protection, potentially covering some impacts through the restriction of activities that may accompany the declaration of MPAs. It is not clear whether by-catch is covered by the measures.</i>
	LV	Partially addressed	By-catch from fisheries is addressed. General, non-bird specific biodiversity measures are likely to address pressures on birds. But it remains unclear if important pressures are covered.
	LT	<i>Partially addressed</i>	<i>Only by-catch is identified and addressed as a relevant pressure. Other pressures are likely to be reduced, especially via MPAs, but little detail is provided regarding which activities and in which areas.</i>
	PL	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats. Also, oil pollution originating from ships is addressed.
	DE	Addressed	By-catch from fisheries is addressed. MPA and fisheries management measures will reduce pressures on bird habitats. Also, visual light disturbances from man-made structures are addressed.
	DK	<i>Partially addressed</i>	<i>Spatial protection measures are mainly provided. However, some measures focus specifically on several bird species. The main restriction identified is fishing in Natura 2000 sites, which would reduce bird by-catch and improve the amount of food available in their habitats. Denmark also makes links to existing measures against oil pollution defined under D8. Measures addressing marine</i>

Region	Member State	Assessment against pressures	Explanation
			<i>litter and broader fisheries impacts (beyond MPAs), are reported for other biodiversity elements, such as mammals, or descriptors, which could also benefit birds. However, these links were not provided by Denmark and are not considered within this assessment.</i>
	SE	Addressed	By-catch from fisheries is addressed. Also, impacts of collisions with boats and marine litter are addressed.
North-East Atlantic Ocean	SE	Addressed	By-catch from fisheries is addressed. Also, impacts of collisions with boats and marine litter are addressed.
	DK	Partially addressed	<i>Spatial protection measures are mainly provided. However, some measures focus specifically on several bird species. The main restriction identified is fishing in Natura 2000 sites, which would reduce bird by-catch and improve the amount of food available in their habitats. Denmark also makes links to existing measures against oil pollution defined under D8. Measures addressing marine litter and broader fisheries impacts (beyond MPAs), are reported for other biodiversity elements, such as mammals, or descriptors, which could also benefit birds. However, these links were not provided by Denmark and are not considered within this assessment.</i>
	DE	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats. Also, visual light disturbances are addressed.
	NL	Addressed	By-catch from fisheries is addressed. Impacts on breeding and refuge areas and biological disturbance caused by various activities (e.g. land claim, dredging, or civil aviation) are covered.
	BE	Addressed	By-catch from fisheries is addressed. Also, collisions with shipping vessels and oil pollution are addressed.
	UK	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats. Visual light disturbance is indirectly addressed. Also, the measures cover impacts from non-indigenous species.

Region	Member State	Assessment against pressures	Explanation
	IE	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats. Also, contaminants are covered.
	FR	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats.
	ES	Addressed	By-catch from fisheries is addressed. Visual light disturbance is addressed on the Canary Islands. Also, oil pollution and non-indigenous species impacts are addressed.
	PT	Partially addressed	By-catch from fisheries is addressed only in the Continental sub-region. Nesting areas are protected in the Continental and Azores subdivisions.
Mediterranean Sea	UK (Gibraltar)	Addressed	By-catch from fisheries is addressed. Also, impacts on bird nests will be reduced. Impacts from hunting and recreational activities are addressed.
	ES	Addressed	By-catch from fisheries is addressed. Also, oil pollution and non-indigenous species introductions in relation to birds are addressed.
	FR	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats. Visual light disturbance and noise are covered. Also, activities attracting predation (from rats and invasive species) are addressed.
	IT	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats.
	MT	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats. Also, visual light disturbances from man-made structures and noise impacts are addressed (incl. from recreational boating). Also, activities attracting predation (from rats) in SPAs are addressed.
	HR	Addressed	<i>Eutrophication, contamination and the dumping of litter in their habitats from various activities are addressed, as well as reducing incidental by-catch from fisheries.</i>
	SI	Partially addressed	<i>The measures only indirectly cover by-catch from fisheries through the implementation of the CFP and spatial protection measures. Other pressures on birds, such as non-indigenous species, litter or activities causing noise or light pollution are</i>

Region	Member State	Assessment against pressures	Explanation
			<i>covered by the measures reported for other descriptors (i.e. D2, D10, D11).</i>
	EL	Not addressed	<i>The measures do not address any specific pressure and just provide spatial protection for some relevant habitats.</i>
	CY	Partially addressed	By-catch is not specifically addressed. Spatial protection measures will reduce pressures on bird habitats.
Black Sea	BG	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on bird habitats.
	RO	Addressed	<i>The measures cover by-catch and — by means of bird-specific spatial protection measures — other transversal pressures on this group, such as litter or contamination.</i>

Table 9 Assessment conclusions of coverage of pressures by Member States for birds (D1, 4)

ii. D1, 4 Fish and cephalopods

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Partially addressed	The pressure extraction of species from commercial fisheries is indirectly addressed. Impacts on functional fish habitats, such as breeding sites and migratory fish habitats, are addressed.
	EE	Partially addressed	<i>Aquaculture, reducing pressures from non-indigenous species introduction and nutrient enrichment are addressed. Spatial protection measures are provided; however, it is not clear whether fishing restrictions will apply within the MPAs, as well as fishing restrictions and size limits of commercial fish. It is not entirely clear whether this also addresses by-catch related pressures.</i>
	LV	Partially addressed	The pressure extraction of species from commercial fisheries is addressed. General, non-fish specific biodiversity measures are likely to address pressures on fish. But it remains unclear if important pressures are covered.

Region	Member State	Assessment against pressures	Explanation
	LT	Partially addressed	<i>By-catch from fisheries is addressed. General impacts on fish habitats and population, such as eutrophication or contamination, are only addressed by general biodiversity measures relevant for all species and habitats. Eutrophication is also covered by measures reported for eutrophication (D5).</i>
	PL	Addressed	The pressure extraction of species from commercial fisheries is addressed. Spatial protection measures will reduce pressures on fish habitats. Impacts on functional fish areas are addressed (i.e. from bottom trawling).
	DE	Addressed	The pressure extraction of species from commercial fisheries is addressed. Longitudinal continuity is addressed for migratory species. The impact of underwater noise is considered.
	DK	Partially addressed	<i>Extraction of species by fisheries and general impacts on certain fish habitats (especially offshore reef areas) are covered within MPAs, as well as physical loss of reefs functioning as nurseries, and nutrient enrichment (affecting plankton and copepods, the main food sources for fish). However, other relevant pressures, such as contaminants or marine litter, are not addressed, nor are links made to other descriptors. Also, it is not clear whether or not fish species such as anadromous fish and fish (e.g. elasmobranchs) associated with the seabed outside of these reef areas are also covered by the measures.</i>
	SE	Addressed	The pressure extraction of species from commercial fisheries is addressed. Also, the pressures of contaminants, marine litter and eutrophication are addressed.
North-East Atlantic	SE	Addressed	The pressure of extraction of species from commercial fisheries and hunting is addressed. Contaminants and eutrophication are addressed for fish.
	DK	Partially addressed	<i>Extraction of species by fisheries and general impacts on certain fish habitats (especially offshore reef areas) are covered within MPAs, as well as physical loss of reefs functioning as nurseries, and nutrient enrichment (affecting plankton and copepods, the main food sources for</i>

Region	Member State	Assessment against pressures	Explanation
			<i>fish). However, other relevant pressures such as contaminants or marine litter are not addressed, nor are links made to other descriptors. Also, it is not clear whether or not fish species such as anadromous fish and fish (e.g. elasmobranchs) associated with the seabed outside of these reef areas are also covered by the measures.</i>
	DE	Addressed	The pressure extraction of species from commercial fisheries is addressed. Longitudinal continuity is addressed for migratory species. The impact of underwater noise is considered.
	NL	Addressed	The pressure extraction of species from commercial fisheries is addressed. Longitudinal continuity is addressed for migratory species. Impacts on fish habitats through various activities are addressed (e.g. shipping, dredging, recreation).
	BE	Addressed	The pressure extraction of species from commercial fisheries is addressed. Contaminants are addressed for fish.
	UK	Addressed	The pressure extraction of species from commercial fisheries and non-commercial fisheries is addressed. Threatened and vulnerable fish species are particularly targeted (e.g. elasmobranchs and migratory fish).
	IE	Addressed	The pressure extraction of species from commercial fisheries is addressed. Spatial protection measures will reduce pressures on fish habitats. Contaminants are addressed for fish.
	FR	Addressed	The pressure extraction of species from commercial fisheries is addressed. Also, fishing impacts on fish habitats are covered. Longitudinal continuity is addressed for migratory species.
	ES	Addressed	The pressure extraction of species from commercial fisheries is addressed. Also, impacts of aquaculture are covered.
	PT	Partially addressed	The pressure extraction of species from commercial fisheries is addressed. Spatial protection measures will reduce pressures on fish habitats. Nevertheless, there is a lack of coverage of non-commercial fish species.
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Spatial protection measures will reduce pressures on fish habitats. However, illegal fishing activities, which cause by-catch for fish, are not addressed.

Region	Member State	Assessment against pressures	Explanation
	ES	Addressed	The pressure extraction of species from commercial fisheries is addressed. Also, impacts of aquaculture are covered.
	FR	Addressed	The pressure extraction of species from commercial fisheries is addressed. Longitudinal continuity is addressed for migratory species. Contaminants are addressed for fish.
	IT	Addressed	The pressure extraction of species from commercial fisheries is addressed. Spatial protection measures will reduce pressures on fish habitats. Contaminants are addressed for fish.
	MT	Addressed	The pressure extraction of species from commercial fisheries is addressed. Also, injury and mortality from ghost fishing (marine litter) are addressed. Specific actions to protect vulnerable elasmobranch species are reported. Malta refers to pressures such as changes to hydrological processes and contaminants, but states it covers these under D7 and D8.
	HR	Addressed	<i>The extraction of species caused by fisheries is addressed, and ghost fishing is reduced, as well as impacts from non-indigenous species introductions, contamination, eutrophication and marine litter from several activities.</i>
	SI	Partially addressed	<i>The extraction of species is indirectly covered, with non-commercial species dealt with only through landing data monitoring from commercial fisheries (by-catch). Non-indigenous species, contaminants or marine litter are covered by measures reported under other descriptors (i.e. D2, D8, D10).</i>
	EL	Not addressed	<i>Only the extraction of species by fisheries is covered in some MPAs. Therefore, despite protecting both commercial and non-commercial species, the effect of the measures will be limited to few MPAs. No further pressures are addressed.</i>
	CY	Addressed	The pressure extraction of species from commercial fisheries is addressed. Spatial protection measures will reduce pressures on fish habitats. Artificial reefs have been reported to improve functional fish habitats.
Black Sea	BG	Addressed	The pressure extraction of species from commercial fisheries and recreational fisheries is addressed.

Region	Member State	Assessment against pressures	Explanation
	RO	Addressed	<i>The extraction of non-commercial species by fisheries (by-catch) and for other purposes is broadly addressed. Contamination and non-indigenous species are also tackled, although mainly within MPAs.</i>

Table 10 Assessment conclusions of coverage of pressures by Member States for fish and cephalopods (D1, 4)

iii. D1, 4 Mammals and reptiles

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Partially addressed	By-catch from fisheries is addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats. Underwater noise is indirectly addressed. The Member State covers contaminants.
	EE	Partially addressed	<i>No specific activity impacting mammals is addressed; however, it is likely that some pressures on these species are addressed, also considering the potential restriction of activities that may accompany both the declaration of MPAs and the species-specific management plans. Contaminants from oil spills are addressed by a measure improving capacity reaction in case of accidents.</i>
	LV	Partially addressed	By-catch from fisheries is indirectly addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats.
	LT	Partially addressed	<i>The measures address incidental by-catch from fisheries. Other relevant impacts on mammals may be addressed by legislation, although the specifics are unclear. One measure indirectly addresses impacts on mammals to a certain extent, as it aims to rescue injured animals. The measures do not address marine litter and underwater noise but they mitigate their impact (rehabilitation centres).</i>
	PL	Partially addressed	By-catch from fisheries is addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats. Contaminants from oil pollution are covered. Underwater noise is not covered.

Region	Member State	Assessment against pressures	Explanation
	DE	Addressed	By-catch from fisheries is addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats. Underwater noise is addressed.
	DK	Partially addressed	<i>Tailored management plans are provided for the harbour porpoise, the common seal and the grey seal, which are the most relevant mammal species present in Danish waters. Incidental by-catch is partly addressed (through their monitoring or their assessment to design a strategy for the protection of the harbour porpoise against it); as well as general impacts on mammal habitats and populations (the measures focus on protected areas). Links are made to pressures addressed by other descriptors (contaminants, marine litter and underwater noise).</i>
	SE	Partially addressed	By-catch from fisheries is addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats. Underwater noise and contaminants are not addressed.
North-East Atlantic Ocean	SE	Partially addressed	By-catch from fisheries is addressed. Spatial protection and MSP measures will reduce pressures on mammal habitats. Underwater noise and contaminants are not covered.
	DK	Partially addressed	<i>Tailored management plans are provided for the harbour porpoise, the common seal and the grey seal, which are the most relevant mammal species present in Danish waters. Incidental by-catch is partly addressed (through their monitoring or their assessment to design a strategy for the protection of the harbour porpoise against it); as well as general impacts on mammal habitats and populations (the measures focus on protected areas). Links are made to pressures addressed by other descriptors (contaminants, marine litter and underwater noise).</i>
	DE	Addressed	By-catch from fisheries is addressed. Underwater noise is covered.
	NL	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. Shipping impacts are addressed.
	BE	Partially	By-catch from fisheries is addressed. However,

Region	Member State	Assessment against pressures	Explanation
		addressed	underwater noise and other shipping impacts on mammal habitats are not covered.
	UK	Addressed	By-catch from fisheries is addressed. Also, underwater noise, contaminants and collisions with ships are covered.
	IE	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. Underwater noise and contaminants are covered.
	FR	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. Underwater noise and contaminants are covered.
	ES	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. Also, underwater noise and collisions with ships are covered for mammals.
	PT	Partially addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. But underwater noise is not covered.
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Spatial protection and MSP measures will reduce pressures on mammal and turtle habitats. But underwater noise and collisions with ships are not addressed.
	ES	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. Underwater noise is covered. Also, mammal collisions with ships are addressed.
	FR	Addressed	By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. Underwater noise and contaminants are covered.
	IT	Addressed	By-catch from fisheries is addressed. Contaminants from pollution are covered. Also, mammal collisions with ships are addressed.
	MT	Partially addressed	Incidental by-catch from fisheries and hunting is addressed, as well as impacts from tourism and mortality of cetaceans from collisions with ships. Only impulsive underwater noise (seismic activities) is covered and continuous noise (from shipping) is not.

Region	Member State	Assessment against pressures	Explanation
	HR	Partially addressed	<i>Incidental by-catch from fisheries, in addition to impacts from contamination and marine litter, are addressed. Mortality and injury to cetaceans from collisions with ships and underwater noise are not covered (except through monitoring efforts).</i>
	SI	Partially addressed	<i>Incidental by-catch from fisheries is only indirectly addressed, while continuous underwater noise and collisions with vessels are addressed. The impact of contaminants and marine litter on mammals and reptiles are covered through measures reported under D8 and D10.</i>
	EL	Not addressed	<i>No specific pressures on mammals are identified by Greece and only spatial protection is provided, which could lower pressures in MPAs. However, the MPAs are not detailed and the scope of the measures is limited to these protected spaces.</i>
	CY	Partially addressed	<i>By-catch of turtles from fisheries is not addressed. Spatial protection measures will reduce pressures on mammal and turtle habitats. Underwater noise will be addressed.</i>
Black Sea	BG	Partially addressed	<i>By-catch from fisheries is addressed. Spatial protection measures will reduce pressures on mammal habitats. Underwater noise will be addressed for oil and gas exploitation activities. No measure has been reported to address pressures from shipping.</i>
	RO	Addressed	<i>Transversal impacts on mammals are covered by a series of tailored MPAs, in which activities that may threaten these animals are restricted (reducing underground noise, marine litter, etc.). Several measures directly address by-catch and reducing the mortality or injury rates of cetaceans. This is strengthened by another measure to develop a network for rescuing injured animals, preventing further deaths and researching these impacts.</i>

Table 11 Assessment conclusions of coverage of pressures by Member States for mammals and reptiles (D1, 4)

iv. D1, 4 Water column habitats

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Partially addressed	Nutrient enrichment is covered by the measures. No links are made between water column habitats and measures addressing non-indigenous species or contaminants (even though these measures are reported under D2 and D8 and will contribute towards reducing the pressure). Marine litter will be addressed indirectly.
	EE	<i>Partially addressed</i>	<i>Nutrient enrichment and non-indigenous species introduction from aquaculture are addressed, as well as contaminants from oil spills. However, pressures from land-based sources of nutrients, likely to cause impacts on water column habitats, are not covered, nor are links made to other descriptors which may address them.</i>
	LV	Partially addressed	Nutrient enrichment and contaminants are addressed. General, non-water column specific biodiversity measures are likely to address pressures on water column habitats. But it remains unclear if important pressures are covered.
	LT	<i>Partially addressed</i>	<i>Eutrophication in the Curonian Lagoon is addressed by preventing nutrient inputs and also by a pilot project on removing the excess of phytoplankton in the water body. Existing legislation addresses nutrients and contaminants through a general approach; however, it is not clear which areas and activities are covered, beyond agriculture in the Curonian Lagoon. The measures reported for biodiversity, and specifically water column habitats, do not address non-indigenous species.</i>
	PL	Partially addressed	Nutrient enrichment is covered by the measures. Spatial protection measures will reduce pressures on water column habitats. No other pressures are directly addressed.
	DE	Partially addressed	Spatial protection measures will reduce pressures on water column habitats (incl. improving seabed habitat conditions and reducing waste-water runoff). No links are made between water column habitats and measures addressing non-indigenous species (even though these measures are reported under D2 and will contribute towards reducing the pressure).
	DK	<i>Partially</i>	<i>Nutrient enrichment is directly addressed, although</i>

Region	Member State	Assessment against pressures	Explanation
		<i>addressed</i>	<i>the activities covered are not mentioned. Hydrological changes and hydrocarbon extraction activities are also covered. However, pressures such as non-indigenous species introductions and micro-litter are not addressed by the water column related measures (links to D2 and D10 have not been made).</i>
	SE	Addressed	Nutrient enrichment and contaminants are addressed. Also, non-indigenous species and hydrographical changes pressures are covered.
North-East Atlantic Ocean	SE	Addressed	Nutrient enrichment and contaminants are addressed. Also, non-indigenous species and hydrographical changes pressures are covered.
	DK	<i>Partially addressed</i>	<i>Nutrient enrichment is directly addressed, although the activities covered are not mentioned. Hydrological changes and hydrocarbon extraction activities are also covered. However, pressures such as non-indigenous species introductions and micro-litter are not addressed by the water column related measures (links to D2 and D10 have not been made).</i>
	DE	Partially addressed	Spatial protection measures will reduce pressures on water column habitats (incl. improving seabed habitat conditions and reducing waste-water runoff). No links are made between water column habitats and measures addressing non-indigenous species (even though these measures are reported under D2 and will contribute towards reducing the pressure).
	NL	Partially addressed	No links are made between water column habitats and measures addressing non-indigenous species, eutrophication, hydrographical changes or contaminants (even though these measures are reported under D2, D5, D7 and D8 and will contribute towards reducing the pressure).
	BE	Partially addressed	No links are made between water column habitats and measures addressing non-indigenous species, eutrophication or contaminants (even though these measures are reported under D2, D5 and D8 and will contribute towards reducing the pressure).
	UK	Partially addressed	The Member State refers to commercial fish and shellfish (D3) and eutrophication (D5) measures to address pressures on water column habitats but

Region	Member State	Assessment against pressures	Explanation
			does not specify which measures are relevant. No links are made between water column habitats and measures addressing non-indigenous species or contaminants (even though these measures are reported under D2 and D8 and will contribute towards reducing the pressure).
	IE	Partially addressed	Contaminants are covered. No links are made between water column habitats and measures addressing non-indigenous species, eutrophication or marine litter (even though these measures are reported under D2, D5 and D10 and will contribute towards reducing the pressure).
	FR	Partially addressed	Extraction of species from commercial fisheries is covered, in addition to aquaculture impacts. No links are made between water column habitats and measures addressing non-indigenous species, eutrophication or contaminants (even though these measures are reported under D2, D5 and D8 and will contribute towards reducing the pressure).
	ES	Addressed	Nutrient enrichment, contaminants, non-indigenous species, marine litter and hydrological conditions are addressed. Spatial protection measures will reduce pressures on water column habitats.
	PT	Partially addressed	Spatial protection measures will reduce pressures on water column habitats. No links are made between water column habitats and measures addressing non-indigenous species, commercial fish and shellfish, eutrophication or contaminants (even though these measures are reported under D2, D3, D5 and D8 and will contribute towards reducing the pressure).
Mediterranean Sea	UK (Gibraltar)	Partially addressed	The Member State refers to commercial fish and shellfish (D3) and eutrophication (D5) measures to address pressures on water column habitats but does not specify which measures are relevant. No links are made between water column habitats and measures addressing non-indigenous species or contaminants (even though these measures are reported under D2 and D8 and will contribute towards reducing the pressure).
	ES	Addressed	Nutrient enrichment, contaminants, non-indigenous species, marine litter and hydrological conditions are addressed. Spatial protection measures will

Region	Member State	Assessment against pressures	Explanation
			reduce pressures on water column habitats.
	FR	Partially addressed	Extraction of species from commercial fisheries is covered. The impact of noise is covered. No links are made between water column habitats and measures addressing non-indigenous species, eutrophication or contaminants (even though these measures are reported under D2, D5 and D8 and will contribute towards reducing the pressure). Marine litter will be addressed indirectly.
	IT	Partially addressed	No water column habitat measures have been reported. But spatial protection measures will reduce pressures on water column habitats. No links are made between water column habitats and measures addressing non-indigenous species, commercial fisheries, eutrophication or contaminants (even though these measures are reported under D2, D3, D5 and D8 and will contribute towards reducing the pressure).
	MT	Partially addressed	Nutrient enrichment is covered by the measures. No links are made between water column habitats and measures addressing non-indigenous species or contaminants (even though these measures are reported under D2 and D8 and will contribute towards reducing the pressure).
	HR	Addressed	<i>Nutrient enrichment, contamination, non-indigenous species and marine litter are addressed.</i>
	SI	Partially addressed	<i>While some of the main pressures are addressed through biodiversity as well as D5 measures, it is not clear whether all relevant pressures are addressed.</i>
	EL	Not addressed	<i>The reported measure specifically addressing water column habitats is limited to monitoring efforts in coastal locations. Spatial protection measures may indirectly help to lower general pressures on these habitats, although their effect will be limited to MPAs.</i>
	CY	Partially addressed	Spatial protection measures will reduce pressures on water column habitats. No links are made between water column habitats and measures addressing non-indigenous species, eutrophication or contaminants (even though these measures are reported under D2, D5 and D8 and will contribute towards reducing the pressure).

Region	Member State	Assessment against pressures	Explanation
Black Sea	BG	Partially addressed	Spatial protection measures will reduce pressures on water column habitats. No links are made between water column habitats and measures addressing non-indigenous species, eutrophication or contaminants (even though these measures are reported under D2, D5 and D8 and will contribute towards reducing the pressure).
	RO	Partially addressed	<i>No specific measures on water column habitats are reported. The MPA-linked restrictions (that cover several activities) will have a limited benefit for these habitats and will be strictly restricted to these protected areas.</i>

Table 12 Assessment conclusions of coverage of pressures by Member States for water column habitats (D1, 4)

v. D1, 4, 6 Seabed habitats

Have the pressures been covered by Member States?

Region	Member State	Assessment against pressures	Explanation
Baltic Sea	FI	Addressed	Physical loss from fisheries is addressed indirectly but the Member State reports that it is not relevant within its waters. Physical loss and damage caused by dredging are addressed. Nutrient enrichment impacts are partially covered.
	EE	Not addressed	<i>Aquaculture is addressed (although the specific actions to protect seabed habitats have not been reported by Estonia). Marine-based renewable energy generation and dredging are not covered. Spatial protection for some areas, which could potentially reduce pressures through the restriction of some activities, is provided.</i>
	LV	Partially addressed	Physical damage from fisheries is addressed. Physical loss caused by dumping of dredge material is partially covered.
	LT	Not addressed	<i>The measures do not directly address dredging and port operations for both physical loss and damage, and fisheries for physical damage. Bottom-trawl fishing is only indirectly addressed through the monitoring of its impacts. General legislation may address other pressures and activities; however, this is not clearly specified.</i>

Region	Member State	Assessment against pressures	Explanation
	PL	Addressed	Physical damage from fisheries is addressed. Pollution caused by dumping of dredge material and discharge of waste-water is covered.
	DE	Partially addressed	Physical loss and damage from fisheries is addressed. Also, habitat loss is covered. But, marine hydrocarbon extraction, marine-based renewable energy generation and solid waste disposal are not directly addressed (although reported under Article 8).
	DK	Partially addressed	<i>Physical loss or damage from submarine cable and pipeline operations, land claim and coastal defence, port operations, fisheries and dredging are covered. While identified as relevant in the Article 8 report, shipping is not covered by the reported measures, and marine-based renewable energy generation is only partially covered by the measure focusing on artificial reefs (that only aims at compensating some of the effects of energy structures at the end of their lifespan).</i>
	SE	Partially addressed	Physical damage and loss from fisheries and dredging are addressed. Impacts from renewable energy, solid waste disposal and shipping are likely to be addressed by spatial protection measures (reported under Article 8). Physical damage from shipping has not been addressed (although reported under Article 8).
North-East Atlantic Ocean	SE	Partially addressed	Physical damage and loss from fisheries and dredging are addressed. Impacts from renewable energy, solid waste disposal and shipping are likely to be addressed by spatial protection measures (reported under Article 8). Physical damage from shipping has not been addressed (although reported under Article 8).
	DK	Partially addressed	<i>Physical loss or damage from submarine cable and pipeline operations, hydrocarbon extraction, land claim and coastal defence, port operations, solid waste disposal, fisheries and dredging are covered. While identified as relevant in the Article 8 report, shipping is not covered by the reported measures, and marine-based renewable energy generation is only partially covered by the measure focusing on artificial reefs (that only aims at compensating some of the effects of energy structures at the end</i>

Region	Member State	Assessment against pressures	Explanation
			<i>of their lifespan).</i>
	DE	Partially addressed	Physical loss and damage from fisheries is addressed. Also, habitat loss is covered. But, marine hydrocarbon extraction, marine-based renewable energy generation and solid waste disposal are not directly addressed (although reported under Article 8).
	NL	Addressed	Physical damage and loss from fisheries is covered. Impacts from land claim and coastal defence and sand and gravel extraction are addressed.
	BE	Partially addressed	Physical damage and loss from fisheries is covered. Impacts from sand and gravel extraction and land claim and coastal defence are not covered by the programme. Pollution is covered regarding shipping. Furthermore, severe pollution from shipping will be covered, in addition to selective extraction of gravel. Land claim activities are not addressed.
	UK	Partially addressed	Physical damage and loss from fisheries and land claim and coastal defence are addressed. Uncertainties exist regarding the coverage of marine renewable energies, hydrocarbon extraction dredging, and sand and gravel extraction are covered by the programme.
	IE	Partially addressed	Physical damage and loss from fisheries, land claim and coastal defence, offshore structures and submarine cables are not sufficiently covered. Impacts from dredging, hydrocarbon exploitation and aquaculture are addressed. Contaminants and marine litter are covered.
	FR	Partially addressed	Physical damage and loss from fisheries and dredging are primarily addressed in MPAs and the deep sea. Also, dredging, aquaculture, land claim and coastal defence, port operations, submarine cables and pipeline operations, solid waste disposal and recreational activities (mooring and anchoring) are covered in the Celtic Seas and Bay of Biscay. In the North Sea, land claim/coastal defence, port operations, research and seaweed harvesting are not covered (although reported under Article 8).
	ES	Partially addressed	Physical damage and loss from fisheries and dredging are addressed (primarily in MPAs). Impacts from hydrocarbon exploitation, renewable

Region	Member State	Assessment against pressures	Explanation
			energies, dredging, underwater cables and pipelines and aquaculture are covered by spatial protection measures. However, it is not clear how much the pressures will be reduced across the large areas of seabed habitats where the pressures occur and thus whether the measures will reduce impacts on affected seabed habitats.
	PT	Not addressed	The measures do not directly address physical loss and damage pressures. Measures are linked to seabed mapping and monitoring activities rather than protection measures.
Mediterranean Sea	UK (Gibraltar)	Partially addressed	Spatial protection measures will reduce pressures on seabed habitats. But pressures from transport, tourism and recreation (incl. anchoring) and dredging are not addressed.
	ES	Partially addressed	Physical damage and loss from fisheries and dredging are addressed (primarily in MPAs). Impacts from hydrocarbon exploitation, renewable energies, dredging, underwater cables and pipelines and aquaculture are covered by spatial protection measures. However, it is not clear how much the pressures will be reduced across the large areas of seabed habitats where the pressures occur and thus whether the measures will reduce impacts on affected seabed habitats.
	FR	Partially addressed	Physical damage and loss from fisheries and dredging are primarily addressed in MPAs and the deep sea. Also, marine mining, submarine cables, aquaculture and port operations are not covered, although they could be addressed by the measures that do not target any specific activity.
	IT	Partially addressed	Physical damage and loss from fisheries are addressed in territorial waters only. Spatial protection measures will reduce pressures on seabed habitats. Impacts from underwater cables and pipelines, port operations, land claim, coastal defence, solid waste disposal are addressed indirectly.
	MT	Partially addressed	Physical damage and loss from fisheries (mainly in MPAs and deep sea, not in Malta's entire waters) and dredging are addressed, in addition to offshore operations, solid waste disposal, marine hydrocarbon extraction, port operations,

Region	Member State	Assessment against pressures	Explanation
Black Sea			aquaculture and tourism. However, industry and urban activities are not addressed by seabed-specific measures (although reported under Article 8). They are likely to be covered by measures defined under other descriptors; however, the link to how these measures would affect seabed habitats is not clearly made.
	HR	Partially addressed	<i>Physical loss and damage from land claim, coastal defence, port operations, submarine cable, dredging, and tourism are addressed, as well as non-indigenous species introductions from shipping and aquaculture. The measures covering these pressures address a very narrow strip of coastal zone, not the overall impact of activities on the marine environment. Fisheries restrictions only concern one habitat type (coralligenous beds; Corallium rubrum is specifically mentioned) and the widespread damage from bottom trawling is only partially covered by the measures. Nutrient enrichment and contamination are addressed in a transversal manner. Seaweed harvesting, identified by Croatia as a relevant source of physical damage, is not addressed.</i>
	SI	Addressed	<i>The measures cover physical loss and damage from land claim, coastal defence, port operations, fisheries, tourism and recreation and shipping.</i>
	EL	Partially addressed	<i>Physical loss and damage from activities such as fisheries, dredging, submarine cables and pipelines, and tourism were identified as relevant by Greece. The reported measures only directly address fisheries, not any other pressure or activity. The measures are strictly spatial protection measures; thus they may restrict activities in MPAs but not in Greek marine waters as a whole. Activities beyond fisheries, especially land-based activities, might be covered by measures reported under other descriptors. However, no such link is clearly made.</i>
	CY	Partially addressed	Physical damage and loss from fisheries and dredging are addressed. Impacts from land claim, coastal defence and port operations are partly covered.
Black Sea	BG	Partially	Physical damage and loss from fisheries and

Region	Member State	Assessment against pressures	Explanation
		addressed	dredging are addressed. Physical loss and damage caused by port operations, land claim and coastal defence are partially covered.
	RO	<i>Partially addressed</i>	<i>While Romania addresses fisheries, extraction of species, dredging, land claim and port operations, shipping and tourism are only covered within MPAs.</i>

Table 13 Assessment conclusions of coverage of pressures by Member States for seabed habitats (D1, 4, 6)

B. Member State conclusions and recommendations

1. Denmark

General conclusions on Denmark's programme of measures

Strengths and weaknesses	
General	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), hydrographical changes (D7, based on the GES definition only since no targets have been defined for D7), contaminants (D8), contaminants in seafood (D9), underwater noise (D11) and water column habitats (D1, 4, based on the target definitions since GES has not been defined for water column habitats). - The Member State considers that GES is likely to be achieved by 2020 for all descriptors, except water column habitats (D1, 4) since GES has not been defined, and eutrophication (D5) for which an exception has been reported. - The programme includes measures that are based on commitments to existing European and regional policies, such as the Habitats Directive (D1, 4, 6; D5; D7; D11), the Birds Directive (D1, 4, 6; D5; D11), the Common Fisheries Policy (D1, 4, 6; D5; D3), the Water Framework Directive (WFD; D5; D8; D9; D10), Directive 85/337/EEC (EIA) (D1, 4, 6; D7; D11), Regulation (EC) No 1907/2006 on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH; D8), Directive 2008/105/EC on environmental quality standards in the field of water policy (D8), Regulation (EU) No 708/2007 concerning the use of alien and locally absent species in aquaculture (D2), Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (D2), Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs (D9), Directive 2008/98/EC on waste (D10), OSPAR Eutrophication Strategy (D5), Directive 2001/42/EC (SEA; D11), OSPAR Recommendation 2012/5 for a risk-based approach to the Management of Produced Water Discharges from Offshore Installations (D8), OSPAR Regional Action Plan for Marine Litter (D10), OSPAR planned Action for underwater noise (D11), HELCOM recommendation 28E/8 Environmentally friendly practices for the reduction and prevention of emissions of dioxins and other hazardous substances from small-scale combustion (D9), HELCOM Marine Litter Action Plan (D10), HELCOM planned Action plan for underwater noise (D11), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships

Strengths and weaknesses

(MARPOL) (D5; D8; D10), IMO — Ballast Water Management Convention (D2), IMO — International Convention on the Control of Harmful Anti-fouling Systems on Ships (D2; D8), IMO Resolution MEPC.200(62) Special Area Provisions and the Designation of the Baltic Sea as a Special Area under MARPOL Annex IV (D5), IMO Resolution MEPC.201(62) Revised MARPOL Annex V (D10), IMO — Recommendations for the reduction of the underwater noise of commercial navigation as a harmful effect on marine organisms (MEPC.1 / Circ.833; D11), Agreement on the Conservation of Small Cetaceans of the Baltic, North East Atlantic, Irish and North Seas (ASCOBANS; D1, 4, 6).

- Denmark reports the spatial scope of all its measures (i.e. WFD coastal waters, territorial waters, and exclusive economic zone).
- The programme includes both existing measures, and new measures that complement those already in place and specifically target pressures on the marine environment which were not otherwise covered.
- The programme includes spatial protection measures (including MPAs). These measures especially address the biodiversity-related descriptors (D1, 4, 6) and therefore contribute towards GES and targets for these descriptors. Measures aim to develop protective actions for existing MPAs and several species and habitats, but also enlarge the MPA network with new sites, restrict certain activities such as fisheries and dredging for example, and develop research efforts.
- The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment while simultaneously implementing measures which complement the direct measures through governance and coordination actions, as well as awareness raising and research efforts.
- In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (especially D1, 4, 6; D2: D10; D11), Denmark reports research efforts. This will allow knowledge gaps to be addressed, but also to build upon the results to enable the design of measures which will contribute directly to tackling the pressures in the MSFD's second implementation cycle.
- Based on the limited information reported by the Member State on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, it is concluded that the new measures are likely to be implemented and thus should contribute to achieving GES by 2020.
- Denmark reports the implementation timeline of all, except two, new measures. Most of them at least started to be implemented before or in 2016.
- The Member State makes several links between the measures for the pressure descriptors and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This enables to understand how state descriptors benefit from these measures, which are likely to contribute in

Strengths and weaknesses	
	addressing pressures on species and habitats.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures only partially addresses GES and targets for eutrophication (D5), marine litter (D10), birds (D1, 4), fish (D1, 4), mammals (D1, 4) and seabed habitats (D1, 4, 6). - Denmark considers that GES will not be achieved by 2020 for eutrophication (D5) (see exceptions below). - While impact assessments were carried out for new measures, the results do not allow for a quantification of what the measures will achieve; i.e. to what extent the relevant pressure will be addressed, and whether the measures will be sufficient to achieve GES. - Pressures on marine species and habitats are often addressed mainly through spatial protection measures (including MPAs), which limits the spatial scope of the measures and hence the potential benefits for species groups and habitats which are distributed throughout the marine waters. - Some of the new measures for which an implementation timeline has been specified will be implemented after 2016 (mainly in 2017, but also one in 2019), thus limiting their contribution to achieving GES by 2020.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of non-indigenous species from shipping (ballast water) (measures linked to the implementation of the BWMC) and aquaculture (reported in Article 8), as well as fisheries, tourism and recreation (not reported under Article 8).
Weaknesses	<ul style="list-style-type: none"> - The programme only addresses biofouling through research and monitoring efforts that have only indirect effects on the pressure. - It is not clear whether the programme includes early detection systems of non-indigenous species introductions as measures.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species from both commercial and recreational fishing. - The programme proposes fishing effort restrictions, gear restrictions and a ban on discarding through the implementation of the CFP. - Denmark's programme covers stocks managed at the national level.
Weaknesses	None identified
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from sources such as industry, agriculture, and urban waste-water discharge (reported in Article 8), as well as shipping and aquaculture (not reported in Article 8). - The measures for eutrophication draw from Member State's WFD RBMPs. In the framework of the MSFD, most measures are considered likely to be sufficient to address pressures of nutrient and organic matter enrichment in the marine environment and cover relevant human activities. However, considering the extent to which the MSFD programme of measures relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment of the 2016 reporting.

Strengths and weaknesses	
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the programme of measures addresses atmospheric deposition of nutrients (NO_x) from sea-based and land-based sources. - The programme does not directly address the targets associated to oxygen concentrations (a reduction in nutrient loading is expected to reduce organic loading, and therefore addresses these targets, but there will be a time lag before it occurs).
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The measures address hydrographical changes from industry, land claim and coastal defence, placement and operation of offshore structures (reported in Article 8), as well as port operations (not reported in Article 8). - The programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisations and regulatory procedures are addressed in terms of hydrographical changes. - The programme utilises synergies with the EIA and Habitats Directives.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not utilise synergies with the SEA Directive, WFD, Maritime Spatial Planning Directive and UWWTD, as well as the integrated coastal zone management processes. - The programme does not explain how it will address the issue of cumulative impacts, i.e. impacts from different/multiple human activities on hydrography.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses contaminant inputs to the sea from land-based (e.g. industry, agriculture and urban areas), as well as sea-based sources (e.g. marine hydrocarbon extraction and shipping). Other activities, not reported under Article 8, are also covered in the programme: offshore structures, solid waste disposal and fisheries. - The programme addresses accidental pollution from marine hydrocarbon extraction, port operations, submarine cables and pipeline, and shipping. - Denmark's programme includes dedicated measures for contaminants in seafood (D9), some of them specifically covering fisheries (trimming of fat), urban and industry (releasing dioxins) (or other various activities). - The programme specifies that measures for contaminants (D8) will contribute to addressing pressures for contaminants in seafood (D9) and allow for progress towards D9 GES and targets. - The programme addresses atmospheric deposition of contaminants through a measure reported for contaminants in seafood (D9). - The measures are likely to cover the biological effects of contaminants through a measure implementing the WFD's RBMP that aims to reduce the impact of environmentally dangerous contaminants.
Weaknesses	None identified
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses marine litter from land-based (e.g. tourism and recreation) and sea-based (e.g. shipping, fisheries, port operations) sources of litter.

Strengths and weaknesses	
	<ul style="list-style-type: none"> - The programme addresses the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter. - The measures address micro-litter entering the environment from industrial (cosmetics) products. - Denmark's programme includes awareness-raising efforts among various target groups (to be established), in addition to direct measures. - The programme makes links to HELCOM's and OSPAR's regional action plans for marine litter.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not fully address aspects of the GES definition associated to non-indigenous species proliferation (and therefore the issue of having no 'detrimental impacts on marine ecosystems or species') and socioeconomic impacts on industries.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - Denmark's programme of measures addresses continuous and impulsive underwater noise from marine research and marine-based renewable energy generation operations (reported under Article 8), as well as shipping and marine hydrocarbon extraction (not reported under Article 8). - The programme includes research efforts, which aim to collect additional data to better characterise the pressure of underwater noise, and its impacts on fauna (mainly marine mammals) in line with a recommendation from TG Noise¹³ (alternative technologies for performing seismic surveys) and addresses knowledge gaps. Denmark contributes to the regional register of the International Council for the Exploration of the Sea for impulsive noise through a supplementary initiative.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address other energy inputs (such as heat or light).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the condition of bird populations via general spatial protection measures and specifies the bird species that are addressed. - Denmark makes links to the measures against oil pollution defined for contaminants (D8).
Weaknesses	<ul style="list-style-type: none"> - The programme does not include specific measures for birds having direct impacts on pressures (only one bird-specific measure is reported, which focuses on research). - The programme does not include measures beyond spatial protection measures for birds. - The programme does not fully address other specific pressures such as incidental by-catch, physical disturbances (light pollution), litter ingestion, effects of non-indigenous species on seabirds, the disturbance of nesting sites by predators and does not clearly cover birds' food sources. It is possible that these are addressed by the measures for non-indigenous

¹³ The technical group 'TG Noise' is a subgroup of the MSFD expert group, which provides a forum for the MSFD Common Implementation Strategy.

Strengths and weaknesses	
	species (D2), marine litter (D10) and underwater noise and energy (D11), for example, but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes general spatial protection measures. - Denmark's programme includes specific measures for fish having direct impact on pressures but especially at offshore reef areas. - The programme addresses pressures such as physical loss of seabed habitats (which have a fish nursery function) due to dredging, and nutrient enrichment.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures might reduce by-catch of non-commercial species, but this has not been clearly stated by Denmark. - It is also not clear whether the measures cover some fish species, such as anadromous fish and fish (e.g. elasmobranchs) associated with the seabed and which occur outside of reef areas. - The programme does not address other specific pressures such as introductions of non-indigenous species, contaminants and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2), contaminants (D8) and marine litter (D10) but based on the information reported this cannot be determined.
D1, 4 — Mammals and reptiles	
Strengths	<ul style="list-style-type: none"> - Denmark's programme of measures includes general spatial protection measures. - The programme also includes measures for specific mammal species. - The measures address specific pressures such as contaminants, marine litter and underwater noise through links to measures reported under D8, D10 and D11.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures only partly addresses the pressure of incidental by-catch from fishing activities (through monitoring and assessment of by-catch and the development of a strategy against by-catch) and does not address another pressure: collisions with ships.
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme includes specific measures for water column habitats. - The programme addresses pressures such as nutrient enrichment through links to the measures reported for eutrophication (D5), contaminants through both links to the measures reported under D8 and a specific measure on offshore oil and gas extraction, and hydrographical changes through a measure that might reduce turbidity and improve water transparency. - The programme of measures directly addresses plankton communities through measures addressing eutrophication. The water column is mainly covered in terms of water quality and plankton is a key feature of the terminology in the monitoring programmes. Additionally, the water column is a key transfer route for most non-seabed species and needs to be

Strengths and weaknesses	
	considered as part of the broader ecological coherence of waters, within MPAs and in relation to food webs.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address other relevant pressures such as non-indigenous species and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2) and marine litter (D10) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses physical loss of and damage to the seafloor from submarine cable and pipeline operations. - The measures address physical damage to the seafloor from marine mining (reported under Article 8), as well as dredging (not reported under Article 8). - The programme addresses physical loss of the seafloor from hydrocarbon extraction, land claim and solid waste disposal (reported under Article 8), as well as port operations (not reported under Article 8).
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address physical damage from shipping. - The programme only partially addresses physical loss from marine-based renewable energy generation (the corresponding measure only aims at compensating some of the effects of energy structures at the end of their lifespan). - The Member State addresses various anthropogenic impacts on seabed habitats through measures that have a rather limited scope (only addressing some habitats types (reefs, sand eel or horse mussel habitats) or focus only on MPAs, for example fisheries). - The majority of pressures discussed relates to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2) and marine litter (D10) but based on the information reported this cannot be determined.
Exception	
<p>Denmark applies an exception for eutrophication (D5). It applies Article 14(1)(e) ‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’. Denmark explains that natural biological processes and slow water replacement between the North Sea and Baltic Sea are expected to delay the full effect of measures. This assessment finds the justification of the exception grounded. The natural conditions of the Baltic Sea would not allow for GES to be achieved by 2020, and historically-enriched sediment may continue to be a net source of nutrients for decades after nutrient loads to both fresh and marine surface waters have been sufficiently reduced. However, the Member State did not specify when GES is expected to be achieved (in relation to Article 14(1)(e)).</p>	

Recommendations for Denmark to consider in its programme of measures:

Recommendations

General

- In general, Denmark should better address certain pressures and activities. These are specified in the descriptor specific recommendations below.
- The Member State should consider whether it is feasible to reduce the current levels of certain pressures in the marine environment (e.g. non-indigenous species, contaminants), given that the majority of direct measures focus on preventing ongoing and future inputs of pressures.
- GES and target definitions should be better addressed for eutrophication (D5), marine litter (D10), birds (D1, 4), fish (D1, 4), mammals (D1, 4) and seabed habitats (D1, 4, 6).
- The Member State should define GES for water column habitats (D1, 4) and targets for hydrographical changes (D7).
- If GES is not expected to be achieved by 2020 (e.g. for eutrophication), then Denmark should estimate the alternative date by when GES will be achieved.
- The Member State should quantify pressures and their expected reduction as a result of the established measures. This could be facilitated by further efforts to address knowledge gaps and define the methodology for such estimations at regional or EU level. Such quantification will also contribute to linking the measures with the achievement of GES.
- The Member State should improve its programme to address pressures on marine species and habitats. Measures should extend beyond MPAs and other spatially protected areas, to ensure a wider geographical coverage to address certain pressures, e.g. physical damage.
- The Member State should ensure better linkages between its programme of measures and monitoring programmes, in order to ensure that the effects of the measures, and hence their efficiency and effectiveness in meeting targets and GES, are measured through the monitoring programmes.
- Denmark should report data collection efforts under the MSFD monitoring programmes (Article 11) and not under the Programme of Measures (Article 13). However, when knowledge is too scarce to design effective measures, it is useful to indicate research actions taken to address these gaps.

D2 — Non-indigenous species

- The Member State should better address the introduction of non-indigenous species in its marine waters from shipping, by including measures targeting bio-fouling, and not just ballast water management, having direct impacts on the pressure.
- The Member State should consider developing non-indigenous species early detection systems and registries as part of the measures, if it is not already the case.

D5 — Eutrophication

- The Member State should clearly address atmospheric deposition of nutrients (NO_x) from sea-based and land-based sources.
- The Member State should explain better how its measures can directly address the targets associated with oxygen concentrations or define additional measures addressing this target.

D7 — Hydrographical changes

- Denmark should utilise synergies with the WFD, MSP Directive, UWWTD and integrated coastal zone management processes.
- The Member State should apply SEA procedures, in addition to EIA procedures, more consistently to ensure that hydrographical changes are tackled at a strategic level, rather

Recommendations
<p>than at project level.</p> <ul style="list-style-type: none"> - Denmark's programme of measures should address cumulative impacts. - The Member State should better address pressures from activities not subject to local/project scale EIAs (e.g. fishing, maritime transport). In some cases (e.g. hydrological changes where local dimension is important) this gap hampers the assessment of cumulative effects.
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should address non-indigenous species proliferation and socioeconomic impacts on marine industries, which are both part of the GES definition, or clearly explain how its measures contribute to address these aspects. - Denmark should develop efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
D11 — Underwater noise and energy
<ul style="list-style-type: none"> - The Member State should consider establishing measures that target other energy inputs where relevant (e.g. heat, light).
D1, 4 — Birds
<ul style="list-style-type: none"> - Denmark should consider establishing additional measures targeting all bird species mentioned in the target definition (beyond those specifically covered in the programme of measures), and also beyond spatial protection measures. - The Member State should consider establishing additional measures to directly address pressures on birds, such as incidental by-catch, physical disturbances (light pollution), disturbances on nesting sites by predators, effects of non-indigenous species and litter ingestion, as well as measures covering birds' food sources. If these are to be addressed via measures reported for other descriptors, the expected effect that such measures are to have on birds should be explained.
D1, 4 — Fish and cephalopods
<ul style="list-style-type: none"> - Denmark's programme should clearly explain whether its measures contribute to reducing incidental by-catch of non-commercial species, or, if it is not the case, establish additional measures about this pressure. - The Member State should explain whether all relevant fish species, including anadromous fish and fish (e.g. elasmobranchs) associated with the seabed which occur outside of reef areas, are covered by the measures. - Denmark should consider establishing additional measures (including MPAs in open sea areas to protect non-commercial fish species) to directly address pressures on fish such as non-indigenous species introduction, contaminants and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that such measures are to have on fish and cephalopods should be explained. - The Member State should provide better information on existing MPAs and the level of protection they provide for fish (commercial and non-commercial), in relation to where fish species occur within Member States' territorial waters, and how they are protected.
D1, 4 — Mammals and reptiles
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to further address relevant pressures on mammals such as incidental by-catch from fishing activities and impacts on mammals due to shipping (collision).
D1, 4 — Water column habitats
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to tackle some

Recommendations

pressures associated with water column habitats, such as non-indigenous species and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that such measures are to have on water column habitats should be explained.

D1, 4, 6 — Seabed habitats

- Denmark should consider establishing additional measures, also beyond spatial protection measures, covering shipping, marine-based renewable energy generation and fisheries.
- The Member State should provide more details on measures related to protected areas (and MPAs) such as their area of coverage or temporal ranges of restrictions. The Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.
- If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D2, D10), the expected effect that such measures are to have on seabed habitats should be explained.

2. Estonia

General conclusions on Estonia's programme of measures

Strengths and weaknesses	
General	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for commercial fish and shellfish (D3), eutrophication (D5), contaminants in seafood (D9) and mammals (D1, 4). - The Member State considers that, if all measures are properly implemented, GES can be achieved by 2020 for non-indigenous species (D2), commercial fish and shellfish (D3) and contaminants in seafood (D9). - The programme includes measures that are based on commitments to existing European and regional policies, such as the Habitats Directive (D1, 4, 6; D2; D7), the Birds Directive (D1, 4, 6), the Common Fisheries Policy (D1, 4, 6; D2; D3; D10), the Maritime Spatial Planning Directive (D1, 4, 6; D7), the WFD (D5; D8/9), HELCOM Baltic Sea Action Plan and recommendations (various) (all descriptors), Directives 2014/52/EU (EIA; D5; D11), Directive 2001/42/EC (SEA; D11), Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (D2), the Nitrates Directive (D5), the UWWTD (D5), the Industrial Emissions Directive (D5), the Environmental Quality Standards Directive (D8/9), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D5; D8/9; D10), IMO — Ballast Water Management Convention (D2), IMO — London Protocol (D8/9), IMO — Oil Pollution Preparedness, Response and Cooperation (D8/9), IMO — Civil Liability for Bunker Oil Pollution Damage (D8/9). - The programme includes both existing, and new measures that complement those already in place and specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures (including MPAs). These measures especially address one descriptor (D1, 4, 6 — Biodiversity) and therefore contribute towards GES and targets for this descriptor. Measures aim to develop the network of protected areas (included in the exclusive economic zone, where there are currently no MPAs) and refer to the Nature Conservation Act and the Estonian Environmental Strategy for 2030. - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment while simultaneously implementing measures which complement the direct measures through governance and coordination actions, as well as awareness raising and research efforts. - In this first implementation cycle of the MSFD, in relation to descriptors for

Strengths and weaknesses	
	<p>which knowledge gaps exist (i.e. non-indigenous species — D2; eutrophication — D5; marine litter — D10; underwater noise and energy — D11), the Member State reports research efforts. This will allow knowledge gaps to be addressed, but also to build upon the results to enable the design of measures which will contribute directly to tackling the pressures in the MSFD's second implementation cycle.</p> <ul style="list-style-type: none"> - Based on the information reported by the Member State on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the programme of measures is likely to be implemented. It should still be noted that a few new measures will be implemented with a delay (after 2016).
Weaknesses	<ul style="list-style-type: none"> - The programme of measures partially addresses GES and targets for non-indigenous species (D2), contaminants (D8), marine litter (D10) (only targets since no GES has been defined for D10), underwater noise (D11) (only targets since no GES has been defined for D11), fish and water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - The programme does not address GES and targets for birds (D1, 4). - No conclusion can be provided regarding whether or not GES and targets are addressed for hydrographical changes (D7). - Estonia considers that GES will not be fully achieved by 2020 for biodiversity (D1, especially mammals), eutrophication (D5) and contaminants (D8) (see exceptions below). - The Member State has not provided a GES definition for hydrographical changes (D7), marine litter (D10) and underwater noise (D11). - In few cases, the programme of measures does not include sufficient links to existing EU policies as well as regional instruments. It is especially the case for contaminants in seafood (D9) and underwater noise (D11). - The spatial scope is only detailed for the new measures (not the existing ones). - While impact assessments were carried out for new measures, the results do not allow for a quantification of what the measures will achieve; i.e. to what extent the relevant pressure will be addressed, and whether the measures will be sufficient to achieve GES. - Estonia's programme of measures does not make sufficient links between the measures for the pressure descriptors and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This prevents understanding of how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of non-indigenous species from shipping (ballast water) (measures linked to the implementation of the BWMC). - The programme also addresses the introduction of non-indigenous species from tourism/recreation and fishing (not reported by Estonia in Article 8), but only indirectly through awareness-raising efforts.

Strengths and weaknesses	
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address biofouling. - It is not clear whether or not the programme includes early detection systems of non-indigenous species introductions as measures.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species from commercial fishing. - The programme proposes spatial fishing bans (for several purposes including stock management and biodiversity conservation, protection of over-exploited stocks) that are in addition to existing CFP measures. - The programme covers stocks managed at the national level and include aspects that relate to age/size structure of species. - The programme includes awareness raising that complement direct measures.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the measures cover recreational fishing (mentioned to some extent in two measures). - The programme of measures does not address the extraction of seaweed and other sea-based food harvesting, although it was identified as a relevant pressure.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from sources such as urban, agriculture and forestry, shipping. - The measures for eutrophication draw from Member State's WFD RBMPs. In the framework of the MSFD, most are considered likely to be sufficient to address pressures of nutrient and organic matter enrichment in the marine environment and cover relevant human activities. However, considering the extent to which the MSFD programme of measures relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment, which will be finalised in 2018. - The programme addresses atmospheric deposition of nutrients (NO_x) from sea-based (link to IMO — MARPOL) and land-based sources (link to the Industrial Emissions Directive). - The programme considers additional aspects, such as improved aquaculture management practices (nutrient neutral aquaculture) for example.
Weaknesses	None identified.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses hydrographical changes from coastal defence and land claim. - The programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisations and regulatory procedures might be addressed in terms of hydrographical changes. - The programme utilises synergies with the MSP and integrated coastal zone management.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not clearly address hydrographical changes from industry, port operations and submarine cable and pipeline operations related activities (identified by Estonia as relevant in its Article 8 report), although these activities might be covered by the measures related to MSP

Strengths and weaknesses	
	<p>and integrated marine and coastal management.</p> <ul style="list-style-type: none"> - The programme does not explain how it will address the issue of cumulative impacts, i.e. impacts from different/multiple human activities on hydrography. Cumulative impacts are a major issue for the MSFD; assessing cumulative impacts would require Member States to consolidate results of individual assessments together to assess the overall scale of hydrographical changes. This is not currently being done by Estonia. - The programme does not mention key pieces of legislation, such as the EIA, SEA and the WFD.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas), as well as sea-based sources (e.g. shipping). - The programme addresses accidental pollution from marine-based renewable energy generation, dredging, industry, port operations, submarine cable/pipeline operations and shipping (even though no measure specifically addresses marine-based renewable energy generation and submarine cable/pipeline operations, they are very likely to be covered by general measures targeting various activities). - The programme addresses atmospheric deposition of contaminants. - The programme addresses contaminants in seafood (D9) via measures for contaminants (D8) (the two descriptors have been reported together).
Weaknesses	<ul style="list-style-type: none"> - The Member State does not clearly explain how measures for contaminants (D8) will contribute to addressing pressures for contaminants in seafood (D9) and allow for progress towards D9 GES and targets. - It is not clear whether the programme of measures covers the biological effect of contaminants.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses marine litter from land-based (e.g. tourism and recreation, port operations, waste management on land) and sea-based (e.g. shipping, fisheries) sources of litter. - Storm water is explicitly addressed, and sea-based sources are well covered. - Regarding the spatial scope of the measures, the programme addresses the reduction of marine litter input in coastal areas and in the open sea. - The programme includes awareness raising efforts in addition to direct measures.
Weaknesses	<ul style="list-style-type: none"> - GES has not been defined yet for marine litter (D10) and it is therefore not clear to which extent the measures will contribute to achieving it. - Even though the Member State recognises the pressure of micro-litter as a relevant and very important issue for its marine waters and has set up a pilot monitoring about it, the programme does not yet fully address micro-litter.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses underwater noise from port operations and shipping. - The programme includes research efforts which aim to collect additional data

Strengths and weaknesses	
	to better characterise the pressure of noise, and impact on fauna (mainly marine mammals) in line with recommendation from TG Noise. This will address knowledge gaps for underwater noise (especially impulsive noise, through the establishment of a register).
Weaknesses	- It is not clear whether the programme of measures addresses other energy inputs (such as heat or light).
D1, 4 — Birds	
Strengths	- The programme of measures addresses the health of bird populations via general spatial protection measures (however, they do not provide any link to bird species).
Weaknesses	<ul style="list-style-type: none"> - The programme does not include specific measures for birds. - The programme does not specify the bird species and habitats that are addressed. - The programme (for birds specifically) does not address specific pressures (except contaminants but only to some extent) such as incidental by-catch, physical disturbances (light pollution, oil pollution), effects of non-indigenous species on seabirds, the disturbance of nesting sites by predation and birds' food sources, and litter ingestion. It is possible that these are addressed by the measures for non-indigenous species (D2), marine litter (D10) and underwater noise and energy (D11) for example but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species by commercial fishing (by-catch should be addressed although it is not clearly stated by Estonia). - The programme includes measures on fishing restrictions and size limits in the ecologically and biologically important regions of fish populations. - The programme includes general spatial protection measures. - The programme addresses other pressures such as non-indigenous species introduction and nutrient enrichment through aquaculture activities, and contaminants.
Weaknesses	- The programme of measures (for fish specifically) does not address other specific pressures such as marine litter. It is possible that these are addressed by the measures for marine litter (D10) but based on the information reported this cannot be determined.
D1, 4 — Mammals and reptiles	
Strengths	- The programme of measures includes measures specifically targeting the two mammal species mentioned in the GES definition, as well as general spatial protection measures.
Weaknesses	- The programme (for mammals specifically) does not address specific pressures (except contaminants) such as by-catch from fishing activities, underwater noise, marine litter (ingestion and entanglement), collisions with ships. It is possible that these are addressed by the measures for marine litter (D10) and underwater noise and energy (D11) for example but based on the

Strengths and weaknesses	
	information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4 — Water column habitats	
Strengths	- In its programme, Estonia addresses pressures on water column habitats such as non-indigenous species introduction and nutrient enrichment through aquaculture activities, and contaminants.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures (for water column habitats specifically) does not address other pressures such as nutrient enrichment and non-indigenous species from sources other than aquaculture, other sources of contaminants, and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures. - It is not clear whether or not the programme directly addresses phytoplankton and zooplankton communities. The water column, although considered in other descriptors, is mainly covered in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which is rarely referenced in the biodiversity measures. Additionally, the water column is a key transfer route for most non-seabed species and needs to be considered as part of the broader ecological coherence of waters, within MPAs and in relation to food webs.
D1, 4, 6 — Seabed habitats	
Strengths	- The programme of measures addresses physical damage of the seafloor from aquaculture through the development of regional aquaculture plans (although the specific actions to protect seabed habitats have not been reported by Estonia).
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address physical loss from marine-based renewable energy generation and physical damage from dredging (reported as relevant by the Member State under Article 8), as well as fisheries, which is reported by neighbouring countries, or other activities potentially destructive to seabed habitats such as recreational activities. - Estonia's programme addresses various anthropogenic impacts on seabed habitats through spatial protection measures, which are often lacking detail on their area coverage and temporal ranges of restrictions. - The majority of pressures discussed relate to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species, eutrophication and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication (D5) and marine litter (D10) but based on the information reported this cannot be determined.
Exceptions	
Estonia applies an exception for eutrophication (D5). It applies Article 14(1)(e) ('natural conditions which do not allow timely improvement in the status of the marine waters concerned'). Estonia reports that the environmental targets and GES in the field of	

Strengths and weaknesses

eutrophication are unlikely to be achieved by 2020, due to natural specificities of the Baltic Sea (very closed marine area, limited water exchange with the North Sea and accumulation of nutrients in the seabed sediments over the past decades). Moreover, climate change could expand the extent of oxygen-deficient areas in its deeper basins, possibly leading to the release of nutrients from sediments and increased levels of dissolved nutrients in the water column.

The assessment finds the justification provided by Estonia to be grounded. Natural conditions of the Baltic Sea would indeed not allow for GES to be achieved by 2020 and historically-enriched sediment may continue to be a net source of nutrients for decades after nutrient loads to both fresh and marine surface waters have been sufficiently reduced. The Member State also did not specify when GES is expected to be achieved (in relation to Article 14(1)(e)).

Estonia applies an exception for contaminants (D8). It applies Article 14(1)(e) ('natural conditions which do not allow timely improvement in the status of the marine waters concerned'). Estonia reports that it is very likely that GES, for all contaminants, will not be achieved by 2020, especially due to natural conditions in the Baltic Sea (very closed basin and the accumulation of contaminants in sediments) and knowledge gaps about contaminants in the marine environment exceeding the environmental quality standards (their sources, spread, but also the biogeochemical processes causing their release from the sediment).

The assessment finds the justification provided by Estonia to be grounded. Some contaminants are indeed persistent and take a long time to break down in the marine environment, depending on natural conditions, and therefore accumulate in sediments. The Member State also did not specify when GES is expected to be achieved (in relation to Article 14(1)(e)).

Estonia applies an exception for mammals (D1, 4). It applies Article 14(1). Estonia stated that GES might not be achieved by 2020 in the case of species for which this achievement depends on climatic conditions. Indeed, the extent of the maximum winter ice cover in the Baltic Sea has significantly decreased over the past century, and the incidence of exceptionally warm winters is expected to increase in the future due to climate change. Consequently, in spite of the implementation of the Ringed Seal Protection Action Plan, there is a high probability that the set environmental objective to restore historic range of Ringed seal will not be achieved.

The assessment finds the justification provided by Estonia to be grounded. Climate change, which is not caused by the Estonian activities alone, might modify the Ringed Seal's habitats that could prevent their proper protection. However, the Member State did not define ad-hoc measures or specify when GES is expected to be achieved (if Article 14(1)(b) or Article 14(1)(e) are applied respectively).

Recommendations for Estonia to consider in its programme of measures:

Recommendations

General

- In general, Estonia's programme of measures should better address certain pressures and activities. These are specified in the descriptor specific recommendations below.
- The Member State should consider whether it is feasible to reduce the current levels of certain pressures in the marine environment, given that the majority of direct measures focus

Recommendations

on preventing ongoing and future inputs of pressures. It is observed that most measures aim to address ongoing and new inputs of pressures, whilst very few seek to remove or reduce what is already present in the marine environment due to past activities (e.g. marine litter, non-indigenous species, and contaminants).

- GES and targets definitions should be better addressed for non-indigenous species (D2), hydrographical changes (D7), contaminants (D8), marine litter (D10), underwater noise (D11), birds, fish and water column habitats (D1, 4) and seabed habitats (D1, 4, 6).
- If GES is not expected to be achieved by 2020 (e.g. for D5, D8 and mammals (D1, 4)), then Estonia should estimate the alternative dates by when GES will be achieved.
- The Member State should define GES for hydrographical changes (D7), marine litter (D10) and underwater noise (D11).
- The Member State should establish more links with existing EU policies and international agreements (e.g. for contaminants in seafood and underwater noise). This would improve the overall coherence and coverage of the programme of measures.
- The Member State should define the spatial scope of measures in detail. Furthermore, the spatial scope of measures should be expanded to cover marine waters beyond coastal waters, where relevant pressures are present. The Member State should consider establishing additional measures beyond spatial protection efforts to address species and habitats. It is important that pressures are addressed across its broader territory.
- Estonia should quantify pressures and their expected reduction as a result of the established measures. This could be facilitated by further efforts to address knowledge gaps and define the methodology for such estimations at regional or EU level. Such quantification will also contribute to linking the measures with the achievement of GES.
- The Member State should make better links between the measures reported for pressure descriptors and their effects on the state descriptors. This would allow a comprehensive view of the impact of measures affecting all descriptors.
- The Member State should ensure better linkages between its programme of measures and monitoring programmes, in order to ensure that the effects of the measures, and hence their efficiency and effectiveness in meeting targets and GES, are measured through the monitoring programmes.
- The Member State should report data collection efforts under the MSFD monitoring programmes (Article 11) and not under the Programme of Measures (Article 13). However, when knowledge is too scarce to design effective measures, it is useful to indicate actions taken to address these gaps via research measures.
- The Member State should provide more information about its measures and its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs and the conservation objectives of the MPAs) and establish additional ones that have direct effects on the pressures

D2 — Non-indigenous species

- The Member State should address the introduction of non-indigenous species in its marine waters from shipping better, by including measures targeting bio-fouling besides ballast water management.
- The Member State should consider developing non-indigenous species early detection systems and registries as part of the measures (or, if this is already the case, provide more details).

Recommendations
D3 — Commercial fish and shellfish
<ul style="list-style-type: none"> - Estonia's programme of measures should clearly cover recreational fishing. - The Member State should address the extraction of species from seaweed and other sea-based food harvesting.
D7 — Hydrographical changes
<ul style="list-style-type: none"> - The Member State should establish measures to tackle hydrographical changes from industry, port operations and submarine cable and pipeline operations related activities. - Estonia's programme should address cumulative impacts on habitats by multiple stressors. - The Member States should utilise synergies with the EIA, SEA and WFD. - The programme should better address pressures from activities not subject to local/project scale EIAs (e.g. fishing, maritime transport). In some cases (e.g. hydrological changes where local dimension is important) this gap hampers the assessment of cumulative effects.
D8/D9 — Contaminants and Contaminants in seafood
<ul style="list-style-type: none"> - The programme should better explain the manner in which the measures for contaminants (D8) contribute to GES and targets for contaminants in seafood (D9). - The Member State should clearly cover the biological effect of contaminants.
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should strive to define GES for marine litter (D10) as mentioned above, and clearly explain how the measures will contribute to achieve it. - the programme should address micro-litter, preferably through direct measures, in addition to indirect measures. - The Member State should make efforts to identify pollution hot spots (e.g. from plastic pellets, lost fishing gear, etc.).
D11 — Underwater noise and energy
<ul style="list-style-type: none"> - The Member State should address data gaps (especially for continuous noise since Estonia established a register for impulsive noise) and consolidate research results to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable defining more concrete and direct measures to address underwater noise in the second MSFD implementation cycle. - In its programme Estonia should consider establishing measures that target other energy inputs if possible (e.g., heat, light).
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should establish additional measures targeting specific bird species. - The Member State should establish additional measures to address pressures on birds, namely, by-catch. Additional measures could target physical disturbances (light pollution, oil pollution), disturbances on nesting sites by predation, effects of non-indigenous species and litter ingestion, as well as measures covering birds' food sources. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on birds should be explained.
D1, 4 — Fish and cephalopods
<ul style="list-style-type: none"> - In its programme, Estonia should establish additional measures (including MPAs in open sea areas to protect non-commercial fish species) to address pressures on fish such as marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on fish and cephalopods should be explained. - The Member State should provide better information on existing MPAs and the level of

Recommendations

protection they provide for fish (commercial and non-commercial), in relation to where fish species occur within Member States' territorial waters, and how they are protected.

D1, 4 — Mammals and reptiles

- The Member State should establish additional measures covering by-catch from fishing activities.
- The programme should contain additional measures, including spatial protection measures, to address relevant pressures on mammals beyond by-catch (e.g. impacts on mammals due to shipping (collision), underwater noise, entanglement and ingestion of litter). If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on mammals should be explained.

D1, 4 — Water column habitats

- The Member State should establish dedicated measures to tackle some pressures associated with water column habitats, such as nutrient enrichment and non-indigenous species from sources other than aquaculture, other sources of contaminants, and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on water column habitats should be explained.
- The Member State should clearly cover plankton populations in its measures.

D1, 4, 6 — Seabed habitats

- The Member State should establish measures covering marine-based renewable energy generation, dredging, fisheries (especially with bottom-contacting gears), as well as other activities potentially destructive to seabed habitats such as recreational activities.
- The Member State should provide more details on spatial protection measures (and MPAs) such as their area of coverage or temporal ranges of restrictions. The Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.
- If seabed habitats are to be addressed via measures reported for other descriptors (e.g. non-indigenous species, eutrophication, marine litter), the expected effect that measures are to have on seabed habitats should be explained.

3. Greece

General conclusions on Greece's programme of measures

Strengths and weaknesses	
General	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), contaminants in seafood (D9), marine litter (D10) and underwater noise (D11). - The Member State considers that GES is already achieved for contaminants in seafood (D9), and GES will be achieved by 2020 for contaminants (D8) everywhere except in some specific marine areas. - The programme of measures includes measures that are based on commitments to existing European and regional policies, such as the Habitats Directive (D1, 4, 6), the Birds Directive (D1, 4, 6), the Common Fisheries Policy (D1, 4, 6; D3; D5; D8/9), the Maritime Spatial Planning Directive (D3; D5; D7), the WFD (D1, 4, 6; D5; D7; D8/9), Barcelona Convention (UNEP/MAP; D1, 4, 6; D8/9; D10 (but not the Regional Action Plan on marine litter)), Directive 2014/52/EU (EIA) (D7; D8/9), Regulation (EU) No 304/2011 concerning the use of alien and locally absent species in aquaculture (D2), the Nitrates Directive (D5), the UWWTD (D5; D7), the Environmental Quality Standards Directive (D8/9), Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs (D8/9), Directive 2008/98/EC on waste and Directive 94/62/EC on packaging and packaging waste (D10), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D2; D8/9), IMO — Ballast Water Management Convention (D2; D8/9), IMO — Recommendations for the reduction of the underwater noise of commercial navigation as a harmful effect on marine organisms (MEPC.1 / Circ.833; D11), Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS, D1, 4, 6; D11). - The programme includes both existing, and new measures that complement those already in place and specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures (including MPAs). These measures especially address two descriptors (D1, 4, 6 — Biodiversity and D3 — Commercial fish and shellfish) and therefore contribute towards GES and targets for these descriptors. Measures aim to develop the network of protected areas, restrict fishing activities and map maerl habitats and benthic communities. - The programme combines direct and indirect measures, thus directly

Strengths and weaknesses	
	<p>addressing pressures on the marine environment while simultaneously implementing measures which complement the direct measures through governance and coordination actions, as well as awareness raising and research efforts.</p> <ul style="list-style-type: none"> - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (especially D2 — Non-indigenous species, D3 — Commercial fish and shellfish, D5 — Eutrophication, D7 — Hydrographical changes, D9 — Contaminants in seafood, D11 — Underwater noise), the Member State reports research efforts. This will allow knowledge gaps to be addressed, but also to build upon the results to enable the design of measures which will contribute directly to tackling the pressures in the MSFD's second implementation cycle.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures partially addresses GES and targets for contaminants (D8), fish and cephalopods (D1, 4), mammals and reptiles (D1, 4) and seabed habitats (D1, 4, 6). - The programme does not address GES and targets for water column habitats (D1, 4). - No conclusion can be provided regarding whether or not GES and targets are addressed for birds (D1, 4) because GES and targets have not been defined for this species group. - Greece does not report when GES will be achieved for all descriptors except contaminants (D8) and contaminants in seafood (D9). - Greece does not report the spatial scope of its measures (i.e. WFD coastal waters, territorial waters, exclusive economic zone, etc.). - The programme of measures does not include a quantification of what the measures will achieve; i.e. to what extent the relevant pressure will be addressed, and whether the measures will be sufficient to achieve GES. - The Member State does not make sufficient links between the measures for the pressure descriptors and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This prevents understanding of how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - Pressures on marine species and habitats are often addressed mainly through spatial protection measures (including MPAs), which limits the spatial scope of the measures and hence the potential benefits for species groups and habitats which are distributed throughout the marine waters. - Based on the limited information reported by the Member State on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, it is not possible to draw a conclusion as to whether or not the new measures are likely to be implemented and thus to contribute to achieving GES by 2020 (lack of information). - Greece does not report the implementation timeline of all its new measures. - All but one of the new measures for which an implementation timeline has been specified will be implemented after 2016 (mainly after 2018; one new measure is in place since 2006).

Strengths and weaknesses	
	<ul style="list-style-type: none"> - For some descriptors (i.e. birds, fish, mammals, water column habitats; D1, 4), Greece only reports indirect measures without sufficiently addressing specific pressures on their marine environment (the measures that concern all species and habitats have more direct impacts though).
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of non-indigenous species from shipping (ballast water) (measures linked to the implementation of the BWMC) and aquaculture. - The programme is also likely to address the introduction of non-indigenous species from tourism as well as professional and amateur fishing (not reported by Greece in Article 8), although no measure directly addresses these activities.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address biofouling. - It is not clear whether the programme includes early detection systems of non-indigenous species introductions as measures.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species from commercial fishing and recreational fishing. - The programme proposes spatial and temporal fishing bans (for several purposes including stock management and biodiversity conservation, protection of over-exploited stocks), most of them being linked to the CFP. - The programme is likely to cover stocks managed at the national level as well as aspects that relate to size of species. - The programme includes awareness raising that complements direct measures.
Weaknesses	None identified.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from sources such as aquaculture, industry, agriculture, and urban waste water discharge. - The measures for eutrophication draw from Member State's WFD RBMPs. In the framework of the MSFD, most are considered likely to be sufficient to address pressures of nutrient and organic matter enrichment in the marine environment and cover relevant human activities. However, considering the extent to which the MSFD programme of measures relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the programme of measures addresses atmospheric deposition of nutrients (NOx) from sea-based and land-based sources.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses hydrographical changes from desalination. - The programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisations and regulatory procedures might be addressed in terms of hydrographical changes.

Strengths and weaknesses	
	- The programme utilises synergies with the EIA Directives, as well as with the WFD, MSP and UWWTD.
Weaknesses	<ul style="list-style-type: none"> - Even though the new measures should cover industry, agriculture and forestry, coastal defence, as well as urban waste water discharge, uncertainties remain. - The programme does not utilise synergies with the SEA Directive. - Greece's programme does not explain how it will address the issue of cumulative impacts, i.e. impacts from different/multiple human activities on hydrography. Cumulative impacts are a major issue for the MSFD; assessing cumulative impacts would require Member States to consolidate results of individual assessments together to assess the overall scale of hydrographical changes.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses contaminant inputs to the sea from land-based (e.g. industry, agriculture and urban areas), as well as sea-based sources (e.g. marine hydrocarbon extraction, aquaculture and shipping). - The programme addresses accidental pollution from shipping (reported in Article 8), as well as marine hydrocarbon extraction, fisheries and port operations (not reported in Article 8). - The programme includes dedicated measures for contaminants in seafood (D9), some of them specifically covering fisheries and aquaculture.
Weaknesses	<ul style="list-style-type: none"> - The programme does not address the introduction of hazardous compounds from marine mining (reported as a relevant source of pressure for contaminants and contaminants in seafood — D8/9 in the Aegean-Levantine Sea only). - It is not clear whether the programme addresses atmospheric deposition of contaminants. - It is not clear whether the programme covers the biological effect of contaminants.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses marine litter from land-based (e.g. tourism and recreation, urban areas, industry) and sea-based (e.g. shipping, fisheries, solid waste disposal, port operations) sources of litter. - The programme addresses the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter. - The programme addresses micro-litter entering the environment from sewage systems. - The programme includes awareness raising efforts in addition to direct measures.
Weaknesses	- The programme does not make any link to the Regional Action Plan on marine litter of the Barcelona Convention.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses underwater noise from marine research, hydrocarbon extraction and shipping. - The programme includes research efforts which aim to collect additional data

Strengths and weaknesses	
	to better characterise the pressure of noise, and impact on fauna (mainly marine mammals) in line with recommendation from TG Noise (creation of acoustic data files) and address knowledge gaps.
Weaknesses	- The programme does not address other energy inputs (such as heat or light).
D1, 4 — Birds	
Strengths	- The programme of measures addresses the condition of bird populations via general spatial protection measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include specific measures for birds having direct impact on pressures (only one bird specific measure is reported and focuses on research and data collection). - The programme does not specify the bird species and habitats that are addressed. - The programme does not address specific pressures such as incidental by-catch, physical disturbances (light pollution, oil pollution), effects of non-indigenous species on seabirds, the disturbance of nesting sites by predation and birds' food sources, contaminants and litter ingestion. It is possible that these are addressed by the measures for non-indigenous species (D2), contaminants (D8), marine litter (D10) and underwater noise and energy (D11) for example but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4 — Fish and cephalopods	
Strengths	- The programme of measures includes general spatial protection measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include specific measures for fish and cephalopods having direct impact on pressures (only two fish specific measures are reported and focus on research and data collection). - The programme does not address any specific pressures such as extraction of species by commercial fishing (by-catch), non-indigenous species introduction, nutrient enrichment, contaminants and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10) but based on the information reported this cannot be determined. - It is unclear if the programme includes specific plans for cephalopods (even though cephalopods are mentioned in a research measure).
D1, 4 — Mammals and reptiles	
Strengths	- The programme of measures includes general spatial protection measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not include specific measures for mammals and reptiles having direct impact on pressures (only one mammals-specific measure is reported and focuses on research and data collection). - The programme does not address specific pressures such as by-catch from fishing activities, contaminants, underwater noise, marine litter (ingestion and entanglement), as well as collisions with ships. It is possible that some of these are addressed by the measures for contaminants (D8), marine litter (D10) and underwater noise and energy (D11) for example but based on the information reported this cannot be determined. This does not allow for an

Strengths and weaknesses	
	understanding of how the state descriptors will benefit from these measures.
D1, 4 — Water column habitats	
Strengths	None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not include specific measures for water column habitats having direct impact on pressures (only one water column habitats specific measure is reported and focuses on monitoring and the assessment of the status of several coastline water systems). - The programme does not address any relevant pressures such as nutrient enrichment, contaminants, non-indigenous species and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures. - It is not clear whether or not the programme directly addresses phytoplankton and zooplankton communities. The water column, although considered in other descriptors, is mainly covered in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which is rarely referenced in the biodiversity measures. Additionally, the water column is a key transfer route for most non-seabed species and needs to be considered as part of the broader ecological coherence of waters, within MPAs and in relation to food webs.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses physical damage of the seafloor from fisheries (but measures are strictly spatial protection measures, thus, they may restrict activities in MPAs but not in the Greek marine waters as a whole).
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the programme addresses physical loss from marine mining, land claim and coastal defence, and submarine cables and pipelines, as well as tourism and recreation. - The measures do not address physical loss from port operations (reported as a relevant source of pressure by all other Member States in the region) - It is not clear whether or not the programme addresses physical damage from dredging and aquaculture. - The programme does not address physical damage from agriculture and forestry, industry and urban activities. - The Member State addresses various anthropogenic impacts on seabed habitats through spatial protection measures, however these measures are often lacking detail on their area coverage and temporal ranges of restrictions. - The majority of pressures discussed relates to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species, eutrophication and marine litter (although the land-based sources of waste discharges (agriculture, industry and urban activities) are also relevant sources of contaminant and nutrient enrichment -related pressures that have an impact on seabed habitats). It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication

Strengths and weaknesses	
	(D5) and marine litter (D10) but based on the information reported this cannot be determined.

Recommendations for Greece to consider in its programme of measures:

Recommendations	
General	
	<ul style="list-style-type: none"> - In general, Greece should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below. - The Member State should consider whether it is feasible to reduce the current levels of certain pressures in the marine environment (e.g. non-indigenous species, contaminants), given that the majority of direct measures focuses on preventing ongoing and future inputs of pressures. - GES and targets definitions should be better addressed for contaminants (D8), fish and cephalopods (D1, 4), mammals and reptiles, water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - The Member State should define GES and targets for birds (D1, 4). - Greece should strive to determine the timelines for achieving GES for all descriptors except D8 and D9 (since the information has already been provided). - The Member State should define the spatial scope of measures in detail. Furthermore, the spatial scope of measures should be expanded to cover marine waters beyond coastal waters, where relevant pressures are present. The Member State should consider establishing additional measures beyond spatial protection efforts to address species and habitats. It is important that pressures are addressed across its broader territory. - The Member State should quantify pressures and their expected reduction as a result of the established measures. This could be facilitated by further efforts to address knowledge gaps and define the methodology for such estimations at regional or EU level. Such quantification will also contribute to linking the measures with the achievement of GES. - In its programme, Greece should make better links between the measures reported for pressure descriptors and their effects on the state descriptors. This would allow a comprehensive view of the impact of measures affecting all descriptors. - The Member State should improve its programme of measures to address pressures on marine species and habitats. Measures should extend beyond MPAs and other spatially protected areas, to ensure a wider geographical coverage of pressures. - The Member State should provide more information on the cost and resource allocations and timelines of implementation of all its new measures. - The Member State should ensure a better balance in between direct and indirect measures when many indirect measures have been reported (relevant for birds, fish, mammals, water column habitats; D1, 4). - The Member State should ensure better linkages between its Programme of Measures and Monitoring Programmes, in order to ensure that the effects of the measures, and hence their efficiency and effectiveness in meeting targets and GES, are measured through the Monitoring Programmes. - The Member State should report data collection efforts under the MSFD monitoring programmes (Article 11) and not under the programme of measures (Article 13). However,

Recommendations
when knowledge is too scarce to design effective measures, it is useful to indicate actions taken to address these gaps via research measures.
D2 — Non-indigenous species
<ul style="list-style-type: none"> - The Member State should address the introduction of non-indigenous species in its marine waters from shipping better, by including measures targeting bio-fouling and not just ballast water management. - The Member State should consider developing early detection systems for non-indigenous species and registries as part of the measures.
D5 — Eutrophication
<ul style="list-style-type: none"> - The Member State should clearly address atmospheric deposition of nutrients (NOx) from sea-based and land-based sources.
D7 — Hydrographical changes
<ul style="list-style-type: none"> - The Member State should either clearly explain how its measures tackle hydrographical changes from industry, agriculture and forestry, coastal defence, as well as urban waste water discharge related activities, or establish measures to cover these activities. - Greece should apply SEA procedures more consistently, in addition to EIA procedures, to ensure that hydrographical changes are tackled at a strategic level, rather than at the project level. - The Member State should address cumulative impacts on habitats by multiple stressors. - Greece's programme should better address pressures from activities not subject to local/project scale EIAs (e.g. fishing, maritime transport). In some cases (e.g. hydrological changes where local dimension is important) this gap hampers the assessment of cumulative effects.
D8/D9 — Contaminants and Contaminants in seafood
<ul style="list-style-type: none"> - The Member State should establish measures to address the introduction of hazardous compounds from marine mining in the Aegean-Levantine Sea. - In its programme, Greece should clearly address atmospheric deposition of contaminants. - The Member State should clearly cover the biological effect of contaminants.
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should link its programme of measures to the Regional Action Plan on marine litter of the Barcelona Convention. - The Member State should develop efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
D11 — Underwater noise and energy
<ul style="list-style-type: none"> - The Member State should consider establishing measures that target other energy inputs if possible (e.g. heat, light).
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should establish additional measures targeting specific bird species. - Greece should establish additional measures to directly address pressures on birds, such as by-catch, physical disturbances (light pollution, oil pollution), disturbances on nesting sites by predation, effects of non-indigenous species, contaminants and litter ingestion, as well as measures covering birds' food sources. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on birds should be explained.
D1, 4 — Fish and cephalopods

Recommendations

- Greece's programme should contain additional measures specific for fish species.
- The Member State should establish additional measures (including MPAs in open sea areas to protect non-commercial fish species) to directly address pressures on fish such as extraction of species by commercial fishing (by-catch), non-indigenous species introduction, nutrient enrichment, contaminants and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on birds should be explained.
- In its programme, Greece should provide better information on existing MPAs and the level of protection they provide for fish (commercial and non-commercial), in relation to where fish species occur within Member States' territorial waters, and how they are protected.
- The Member State should explain whether or not the programme of measures includes plans for cephalopods.

D1, 4 — Mammals and reptiles

- The Member State should establish additional measures specific for mammals and reptiles.
- Greece should establish additional measures, including spatial protection measures, to directly address relevant pressures on mammals such as by-catch from fishing activities, impacts on mammals due to shipping (collision), contaminants, underwater noise, entanglement and ingestion of litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on mammals should be explained.

D1, 4 — Water column habitats

- The Member State should establish dedicated measures to tackle some pressures associated with water column habitats, such as nutrient enrichment, contaminants, non-indigenous species and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on water column habitats should be explained.
- The Member State should clearly cover plankton populations in its measures.

D1, 4, 6 — Seabed habitats

- The Member State should clearly explain whether or not the measures cover marine mining, land claim and coastal defence, submarine cables and pipelines, tourism and recreation, as well as dredging and aquaculture.
- Greece should establish measures covering port operations, agriculture and forestry, industry and urban activities, as well as other activities potentially destructive to seabed habitats.
- The Member State should provide more details on measures related to protected areas (and MPAs) such as their area of coverage or temporal ranges of restrictions. The Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved.
- If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D2 — non-indigenous species, D5 — eutrophication, D10 — marine litter), the expected effect that measures are to have on seabed habitats should be explained.

4. Croatia

General conclusions on Croatia's programme of measures

Strengths and weaknesses	
General	
Strengths	<ul style="list-style-type: none"> - Croatia's programme of measures addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), contaminants in seafood (D9), fish and cephalopods (D1, 4) and water column habitats (D1, 4). - The Member State considers that GES should be achieved by 2020 for non-indigenous species (D2). - The programme includes measures that are based on commitments to existing European and regional policies, such as the Birds and Habitats Directives (all descriptors), the Maritime Spatial Planning Directive (all descriptors), the Common Fisheries Policy (all descriptors), the Maritime Spatial Planning Directive (all descriptors), the integrated coastal zone management (all descriptors), the WFD (all descriptors), Directive 2001/42/EC (SEA; all descriptors), Regulation (EC) No 338/97 on the protection of species of wild fauna and flora by regulating trade therein (D1, 4, 6; D2; D3; D5; D9), Regulation (EC) No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea (D1, 4, 6; D2; D3; D5), proposal for a Regulation amending Regulation (EU) No 1343/2011 on certain provisions for fishing in the General Fisheries Commission for the Mediterranean (GFCM; D1, 4, 6; D2; D3), UNEP/MAP — Action Plan for the conservation of the coralligenous and other calcareous bio-concretions in the Mediterranean Sea (D1, 4, 6; developed by the Regional Activity Centre for Specially Protected Areas), Directive 2014/52/EU (EIA; D7), UNEP/MAP regional action plan for marine litter (D10), as well as international instruments such as the International Maritime Organisation's (IMO) — Ballast Water Management Convention (all descriptors), UNFCCC — Kyoto Protocol (D1, 4, 6; D2; D3; D5; D10), International Convention for the Administration and Supervision of Marine Ballast Water and Waste on the Adriatic Sea (D5), International Convention on the Removal of Wrecks, the International Convention on Liability and Compensation for Damage in Connection with the Carriage of Hazardous and Noxious Substances by Sea (the HNS Convention) and the Ship Recycling Convention (D10). - The programme includes new measures that complement those already in place and specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures (including MPAs). These measures address several descriptors (D1, 4, 6 — Biodiversity, D2 —

Strengths and weaknesses	
	<p>Non-indigenous species, D3 — Commercial fish and shellfish, D5 — Eutrophication, D8 — Contaminants, D9 — Contaminants in seafood, D10 — Marine litter) and therefore contribute towards achieving GES and targets for these descriptors. Measures aim to identify priority areas to protect renewable marine resources, increase the protection of the sea-floor and beaches, ban or restrict fishing activities or other activities causing pollution the marine environment, map pressures and activities on the marine environment and coastal zone.</p> <ul style="list-style-type: none"> - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment while simultaneously implementing measures which complement the direct measures through governance and coordination actions, as well as awareness-raising and research efforts. - The Member State makes links between the measures for the pressure descriptors and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This enables an understanding of how state descriptors can benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D2 — Non-indigenous species, D3 — Commercial fish and shellfish, D7 — Hydrographical changes, D10 — Marine litter, D11 — Underwater noise and energy), the Member State reports research efforts. This will allow knowledge gaps to be addressed, but also to build upon the results to enable the design of measures which will contribute directly to tackling the pressures in the MSFD's second implementation cycle. - Based on the information reported by the Member State on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the programme of measures is likely to be implemented.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures partially addresses GES and targets for hydrographical changes (D7), contaminants (D8), marine litter (D10), underwater noise (D11), birds (D1, 4), mammals and reptiles (D1, 4) and seabed habitats (D1, 4, 6). - Croatia does not report when it expects GES to be achieved for all descriptors except D2 (where GES, in the whole marine area, should be achieved by 2020). - In several cases, the programme does not include sufficient links to existing European policies as well as regional instruments. This is especially the case for non-indigenous species (D2), eutrophication (D5), contaminants (D8), contaminants in seafood (D9), marine litter (D10) and underwater noise (D11). - The Member State often reports measures for several descriptors, while the description of these measures explains the relevance to only one of the descriptors (i.e. it is not clear how the measures are relevant for all reported

Strengths and weaknesses	
	<p>descriptors).</p> <ul style="list-style-type: none"> - The spatial scope is only detailed for the new measures (not the existing ones). - In rare cases for some descriptors (especially D11 — underwater noise), the Member State over relies on indirect measures without sufficiently addressing specific pressures on its marine environment. - While impact assessments were carried out for new measures, the results do not allow for a quantification of what the measures will achieve; i.e. to what extent the relevant pressure will be addressed, and whether the measures will be sufficient to achieve GES. - The spatial measures reported in the programme of measures do not always provide clear and specific information on the management efforts that were/are expected to be put in place. Information gaps include the size, number and location of MPAs, the conservation objectives of the MPAs, their ecological coherence and the measures that will be in place within these areas. Other measures are also lacking details on what they aim to achieve in terms of reduction of pressures and impacts.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of non-indigenous species from aquaculture and shipping (ballast water and hull fouling) (measures linked to the implementation of the BWMC and other IMO guidelines, without naming them). - The programme also addresses the introduction of non-indigenous species from fishing (an activity not reported under D2 — Non-indigenous species by Croatia in Article 8). - The programme includes early detection systems of non-indigenous species introductions as measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not clearly address the introduction of non-indigenous species from tourism and recreational activities (an activity reported under D2 — Non-indigenous species by Croatia in Article 8).
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species from commercial fishing. - The programme proposes spatial and temporal fishing bans (for several purposes including stock management and biodiversity conservation, protection of habitats) that are in addition to existing CFP measures. - The programme covers stocks managed at the national level and includes aspects that relate to age/size structure of species.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme of measures covers recreational fishing.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from sources such as aquaculture, industry, urban, agriculture (activities reported under D5 — Eutrophication by Croatia in Article 8), but also shipping and fisheries (activities not reported in Article 8).

Strengths and weaknesses	
	<ul style="list-style-type: none"> - The measures for eutrophication draw from Member State's WFD RBMPs. In the framework of the MSFD, most are considered likely to be sufficient to address pressures of nutrient and organic matter enrichment in the marine environment and cover relevant human activities. However, considering the extent to which the MSFD programme of measures relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment. - The programme addresses atmospheric deposition of nutrients from several sources (not mentioned). - The programme considers additional aspects, such as shipping and fisheries.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not include many synergies with key pieces of legislation such as the UWWTD, the Nitrates Directive, Industrial Emissions Directive and the National Emission Ceilings Directive (as mentioned above).
D7 — Hydrographical changes	
Strengths	<p>Despite the Member State not reporting hydrographical changes or any of its potential sources in its Article 8 assessment:</p> <ul style="list-style-type: none"> - The programme of measures addresses hydrographical changes from various sources such as desalination, industry, agriculture, urban areas, coastal defence/land claim and port operations. - The programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisations and regulatory procedures might be addressed in terms of hydrographical changes. - The programme utilises synergies with the WFD, SEA, EIA, MSP and integrated coastal zone management. - The programme is likely to address cumulative impacts through some of the measures (e.g. those linked to SEA, MSP, integrated coastal zone management), i.e. impacts from different/multiple human activities on hydrography.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether Croatia addresses 'Heavily Modified Water Bodies' in its measures (although specified in the targets definition).
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses contaminant inputs to the sea from land-based (e.g. industry, agriculture, urban areas), as well as sea-based (e.g. shipping) sources. Even though no measure specifically addresses urban activities, they are very likely to be covered by an existing measure on the reduction of pollution from priority substances through point and diffuse sources. - The programme addresses accidental pollution (despite not reporting it or any of its potential sources in Article 8) from several and diffuse sources such as industry, fisheries or aquaculture. - The programme addresses atmospheric deposition of contaminants. - The programme addresses contaminants in seafood (D9) via measures that have also been reported for contaminants (D8) (except one).

Strengths and weaknesses	
Weaknesses	<ul style="list-style-type: none"> - As mentioned above, the programme of measures for contaminants in seafood (D9) does not make sufficient references to relevant EU policies such as rules on setting maximum levels for certain contaminants in foodstuffs,¹⁴ and the rules on methods of sampling and analysis for the control of levels of dioxins.¹⁵
D10 — Marine litter	
Strengths	<p>Despite Croatia not reporting marine litter or any of its potential sources in its Article 8 assessment:</p> <ul style="list-style-type: none"> - The programme of measures addresses marine litter from land-based (e.g. port operations) and sea-based (e.g. shipping, fisheries) sources of litter. - The programme addresses the pressure of micro-plastics from various activities. - The programme addresses the reduction of marine litter input mainly to the open sea but also in coastal areas to some extent. - The programme includes awareness-raising efforts in addition to direct measures.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address marine litter from urban activities (besides through awareness-raising efforts) and tourism/recreational activities (activities reported by most neighbouring Member States in the sub-region). - The programme does not include any activity to remove litter from beaches.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes research efforts which aim to collect additional data to better characterise the pressure of noise and its impacts on fauna (mainly marine mammals) in line with the recommendation from TG Noise. This will address knowledge gaps for underwater noise (both continuous noise through monitoring efforts and impulsive noise, through the establishment of a register).
Weaknesses	<ul style="list-style-type: none"> - The programme only includes indirect measures on underwater noise. - The measures do not directly address underwater noise from marine research and shipping (reported in Article 8). - It is not clear whether the programme addresses other energy inputs (such as heat or light). - As mentioned above, the programme for underwater noise and energy (D11) does not make sufficient reference to relevant EU and international policies such as the EIA and IMO Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the protection of bird populations from fisheries (including incidental by-catch), marine litter (from various

¹⁴ Commission Regulation (EC) No 1881/2006 of 19 December 2006 setting maximum levels for certain contaminants in foodstuffs.

¹⁵ Commission Regulation (EU) 2017/644 of 5 April 2017 laying down methods of sampling and analysis for the control of levels of dioxins, dioxin-like PCBs and non-dioxin-like PCBs in certain foodstuffs and repealing Regulation (EU) No 589/2014.

Strengths and weaknesses	
	<p>activities that have not been specified), as well as nutrient inputs and contamination from land-based (e.g. agriculture, industry, tourism, urban, coastal constructions) and sea-based sources (e.g. fisheries, aquaculture, shipping, recreational activities).</p> <ul style="list-style-type: none"> - The programme includes general spatial protection measures. - The Member State complements its direct measures with indirect measures focusing on awareness-raising about the impact of incidental by-catch on birds, fish and mammals.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not specify the bird species and habitats that are addressed. - The programme (for birds specifically) does not address specific pressures such as effects of non-indigenous species on seabirds and the disturbance of nesting sites. It is possible that these are addressed by the measures for non-indigenous species (D2) for example but, based on the information reported, this cannot be determined.
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - All measures reported for fish and cephalopods (D1, 4) have also been reported as relevant for commercial fish and shellfish (D3); therefore, these measures concern both commercial and non-commercial species. - The programme of measures addresses the extraction of species (including incidental by-catch) by commercial fishing, non-indigenous species introduction from aquaculture, fisheries and shipping activities, marine litter from unspecified activities (like the removal of abandoned fishing gears), as well as nutrient inputs and contamination from land-based (e.g. agriculture, industry, tourism, urban, coastal constructions) and sea-based (e.g. fisheries, aquaculture, shipping, recreational activities) sources. - The programme includes measures on spatial, temporal and technical (gear) fishing restrictions. - The programme includes general spatial protection measures.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures includes little information on the level of protection MPAs are to provide for fish (commercial and non-commercial), in relation to where fish species occur within Member State's waters, and how they are protected.
D1, 4 — Mammals and reptiles	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species (including incidental by-catch) by fisheries, marine litter (includes the reduction litter volumes in the sea and removal of abandoned fishing gears), as well as nutrient inputs and contamination from various land-based (e.g. agriculture, industry, tourism, urban, coastal constructions) and sea-based (e.g. fisheries, aquaculture, shipping, recreational activities) sources. - Croatia's programme addresses underwater noise but only indirectly through monitoring efforts. - The programme includes general spatial protection measures.
Weaknesses	<ul style="list-style-type: none"> - The programme does not specify the mammal and reptile species and habitats that are addressed.

Strengths and weaknesses	
	<ul style="list-style-type: none"> - The programme of measures (for mammals specifically) does not address specific pressures such as underwater noise (except through indirect monitoring measures) and collisions with ships. It is possible that these are addressed by the measures for underwater noise and energy (D11), for example, but based on the information reported this cannot be determined.
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The Member State addresses pressures on water column habitats such as non-indigenous species introductions from aquaculture and shipping, marine litter (and micro-plastics), nutrient enrichment and contamination through various land-based (e.g. agriculture, industry, tourism, urban, coastal constructions) and sea-based (e.g. fisheries, aquaculture, shipping, recreational activities) sources. - The programme of measures includes general spatial protection measures. - The programme covers plankton communities, indirectly through monitoring efforts, but also through measures that significantly reduce impacts that may threaten the natural conditions. The water column, although considered in other descriptors, is mainly covered in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which is rarely referenced in the programme's biodiversity measures. Additionally, the water column is a key transfer route for most non-seabed species and needs to be considered as part of the broader ecological coherence of waters, within MPAs and in relation to food webs.
Weaknesses	None identified
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses physical loss mainly in the coastal zone from land claim/coastal defence, port operations and submarine cables (activities reported by Croatia in Article 8), as well as dredging and tourism/recreational activities (not reported in Article 8). Even though no habitat-specific measure directly addresses submarine cables, it is likely to be covered by horizontal measures on MSP. - The programme addresses physical damage of the seafloor from fisheries, but only for one habitat type (activity reported by Croatia in Article 8), as well as tourism/recreational activities, land claim/coastal defence and port operations (activities not reported in Article 8). - The programme addresses other pressures such as non-indigenous species introduction from shipping and aquaculture, as well as nutrient enrichment and contamination from various land-based and sea-based sources.
Weaknesses	<ul style="list-style-type: none"> - Croatia's programme of measures does not address physical damage from seaweed and other sea-based food harvesting. - Minimal consideration is provided to marine litter. It is possible that it addressed by the measures for marine litter (D10) but based on the information reported this cannot be determined. - The measures focusing on fisheries restrictions have a limited scope since only one habitats type is specifically mentioned (coralligenous beds), which limits the ability of the programme to reduce the widespread damage from

Strengths and weaknesses	
	bottom trawling on all relevant habitat types.

Recommendations for Croatia to consider in its programme of measures:

Recommendations	
General	
	<ul style="list-style-type: none"> - In general, Croatia should better address certain pressures and activities in its programme of measures. These are specified in the descriptor specific recommendations below. - The Member State should consider whether it is feasible to reduce the current levels of certain pressures in the marine environment, given that the majority of direct measures focus on preventing ongoing and future inputs of pressures. It is observed that most measures aim to address ongoing and new inputs of pressures, whilst very few seek to remove or reduce what is already present in the marine environment due to past activities (e.g. non-indigenous species, contaminants, litter). - GES and target definitions should be better addressed for hydrographical changes (D7), contaminants (D8), marine litter (D10), underwater noise (D11), birds (D1, 4), mammals and reptiles (D1, 4) and seabed habitats (D1, 4, 6). - The Member State should strive to determine the timelines for achieving GES. - The Member State should establish more links with existing EU policies and international agreements (e.g. for D2 — Non-indigenous species, D5 — Eutrophication, D8 — Contaminants, D9 — Contaminants in seafood, D10 — Marine litter and D11 — Underwater noise and energy). This would improve the overall coherence and coverage of the programme of measures. - The Member State should explain better how the same measure reported for several descriptors is relevant for each one of these descriptors. - Croatia's programme should define the spatial scope of measures in detail. Furthermore, the spatial scope of measures should be expanded to cover marine waters beyond coastal waters, if the pressures are present here. It is important that pressures are addressed across its broader territory. - The Member State should consider establishing measures that have direct effects on the pressures. - The Member State should quantify pressures and their expected reduction as a result of the established measures. This could be facilitated by further efforts to address knowledge gaps and define the methodology for such estimations at regional or EU level. Such quantification will also contribute to linking the measures with the achievement of GES. - The Member State should provide more information about its measures on what they aim to achieve in terms of reduction of pressures and impacts, and more specifically its spatial protection measures (size, number and location of MPAs and the conservation objectives of the MPAs). - The Member State should ensure better linkages between its programme of measures and its monitoring programmes, in order to ensure that the effects of the measures, and hence their efficiency and effectiveness in meeting targets and GES, are measured through the monitoring programmes. - The Member State should report data collection efforts under the MSFD monitoring programmes (Article 11) and not under the programme of measures (Article 13). However,

Recommendations
when knowledge is too scarce to design effective measures, it is useful to indicate actions taken to address these gaps via research measures.
D2 — Non-indigenous species
- The Member State should address the introduction of non-indigenous species in its marine waters from tourism and recreational activities.
D3 — Commercial fish and shellfish
- Croatia should cover recreational fishing (or, if this is already the case, provide more details).
D5 — Eutrophication
- The Member State should establish more synergies with key pieces of legislation such as the UWWTD, the Nitrates Directive, Industrial Emissions Directive and the National Emission Ceilings Directive.
D7 — Hydrographical changes
- The Member State should clearly address Heavily Modified Water Bodies, or, if it is already the case, explain better how the measures cover them.
D8/D9 — Contaminants and Contaminants in seafood
- Member States should establish more links with existing EU policies for Contaminants in seafood (D9).
D10 — Marine litter
- The Member State should address marine litter from urban activities, preferably through direct measures in addition to indirect measures, and tourism/recreational activities.
- Croatia should consider establishing measures about removal of litter from beaches and about products responsible for beach litter coming from both sea-based and land-based sources (such as single-use plastic items).
- The Member State should make efforts to identify pollution hot spots (e.g. from plastic pellets, lost fishing gear, etc.).
D11 — Underwater noise and energy
- In its programme, Croatia should consider establishing measures having direct effects on the pressure, especially from marine research and shipping, in addition to indirect measures.
- The Member State should consider establishing measures that target other energy inputs if possible and if relevant (e.g., heat, light).
- The Member State should utilise more synergies with relevant existing EU legal acts, such as the EIA Directive; as well as implement measures in accordance to relevant IMO Guidelines for the reduction of underwater noise from commercial shipping to address adverse impacts on marine life.
D1, 4 — Birds
- Croatia should specify in its measures which species and habitats are covered, and if necessary, establish additional measures targeting those bird species not adequately addressed.
- The Member State should establish additional measures to address pressures on birds, namely, disturbances on nesting sites and effects of non-indigenous species. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on birds should be explained.
D1, 4 — Fish and cephalopods

Recommendations

- The Member State should provide better information on existing MPAs and the level of protection they provide for fish (commercial and non-commercial), in relation to where fish species occur within Member States' waters, and how they are protected.

D1, 4 — Mammals and reptiles

- The Member State should specify in its measures which species and habitats are covered, and if necessary, establish additional measures targeting those mammal and reptiles species not adequately addressed.
- The Member State should establish additional measures to address relevant pressures on mammals and reptiles beyond incidental by-catch (e.g. impacts on mammals due to shipping (collision), underwater noise). If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on mammals should be explained.

D1, 4, 6 — Seabed habitats

- The Member State should establish measures covering seaweed and other sea-based food harvesting, activities reported in Article 8 as a source of physical damage.
- If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D10 — Marine litter), the expected effect that measures are to have on seabed habitats should be explained.
- The Member State should establish additional fisheries restrictions on all relevant habitats types to effectively reduce the potential widespread impact of bottom-contacting gear.

5. Lithuania

General conclusions on Lithuania's programme of measures

Strengths and weaknesses	
General	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses GES and targets for non-indigenous species (D2) and eutrophication (D5). - Lithuania considers that GES is likely to be achieved by 2020 for commercial fish and shellfish (D3), birds (D1, 4) and seabed habitats (D1, 4, 6). - The programme of measures includes measures that are based on commitments to existing European and regional policies, such as the Habitats Directive (D1, 4, 6; D2; D3; D8/9), the WFD (D1, 4, 6; D3; D5; D8/9), Directive 85/337/EEC (EIA) (D1, 4, 6; D11), Directive 2001/42/EC (SEA; D1, 4, 6; D11), Directive 2008/98/EC on waste (D8/9; D10), the Sewage Sludge Directive (86/278/EEC; D1, 4, 6; D5; D8/9), the UWWTD (91/271/EEC; D1, 4, 6; D5; D8/9; D10), the Nitrate Directive (91/676/EEC; D1, 4, 6; D5), Directive 2000/59/EC on port reception facilities for ship-generated waste and cargo residues (D8/9; D10), the Birds Directive (D1, 4, 6), Regulation (EU) No 708/2007 concerning the use of alien and locally absent species in aquaculture (D2), Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (D2), Regulation (EC) No 1098/2007 establishing a multiannual plan for cod stocks in the Baltic Sea and the fisheries exploiting those stocks (D3), Regulation (EC) No 1907/2006 on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH; D8/9), Directive 2008/105/EC on environmental quality standards in the field of water policy (D8/9), Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants (D8/9), Regulation (EC) No 782/2003 on the prohibition of organotin compounds on ships (D8/9), Directive 2010/75/EU on industrial emissions (D8/9; D10), HELCOM Baltic Sea Action Plan (D1, 4, 6; D3; D8/9; D10), HELCOM recommendations 28E/8, 28E/12 (D8/9), 28E/10, 28E/5, 28E/6 (D8/9; D10), 28E/9 (D1, 4, 6), HELCOM Marine Litter Action Plan (D10), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D2; D8/9; D10), IMO — Ballast Water Management Convention (D2; D8/9; D10), IMO — International Convention on the Control of Harmful Anti-fouling Systems on Ships (D2; D8/9), IMO — Resolution MEPC.207(62) guidelines for the control and management of ships' biofouling to minimise the transfer of invasive aquatic species (D2), IMO — Recommendations for the reduction of the underwater noise of commercial navigation as a harmful effect on marine organisms (MEPC.1 / Circ.833; D11). - The programme of measures includes both existing measures, and new measures that complement those already in place.

Strengths and weaknesses	
	<ul style="list-style-type: none"> - The programme includes spatial protection measures (including MPAs). These measures especially address the biodiversity-related descriptors (D1, 4, 6) and therefore contribute towards achieving GES and targets for these descriptors. Measures aim to develop protective actions for existing MPAs and several species and habitats (birds are specifically mentioned). - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment while simultaneously implementing measures which complement the direct measures through governance and coordination actions, as well as awareness raising and research efforts. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (especially D1, 4, 6 — Biodiversity, D3 — Commercial fish and shellfish, D5 — Eutrophication, D10 — Marine litter, D11 — Underwater noise and energy), the Member State reports research efforts. This will allow knowledge gaps to be addressed, but also to build upon the results to enable the design of measures which will contribute directly to tackling the pressures in the MSFD's second implementation cycle. - Based on the information reported by the Member State on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, it is concluded that the new measures are likely to be implemented but will partially contribute to achieving GES by 2020 since all measures will be implemented too late in the process, namely after 2016. - The Member State makes several links between the measures for the pressure descriptors and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This enables an understanding of how state descriptors can benefit from these measures, which are likely to contribute in addressing pressures on species and habitats.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures only partially addresses GES and targets for commercial fish and shellfish (D3), contaminants and contaminants in seafood (D8/9), birds (D1, 4) and water column habitats (D1, 4). - The programme does not address GES and targets for fish (D1, 4) and seabed habitats (D1, 4, 6). - Lithuania considers that GES will not be achieved by 2020 for non-indigenous species (D2), eutrophication (D5) as well as contaminants and contaminants in seafood (D8/9), and food webs (the assessment assumes the exception only concerns fish and water column habitats (D1, 4)) (see exceptions below). - In rare cases, the programme does not include sufficient links to key existing European policies as well as regional instruments. This is especially the case for commercial fish and shellfish (D3) and contaminants in seafood (D9), where the CFP and Regulation (EC) 1881/2006 are not explicitly referenced. - Lithuania only reports the spatial scope of some of its existing but not yet implemented measures, and all its new and completely new measures (i.e. whether they apply to WFD coastal waters, territorial waters, exclusive economic

Strengths and weaknesses	
	<p>zone, etc.).</p> <ul style="list-style-type: none"> - The programme does not include a quantification of what the measures will achieve; i.e. to what extent the relevant pressure will be addressed, and whether the measures will be sufficient to achieve GES. - The spatial protection measures reported do not always provide clear and specific information on the management efforts that were/are expected to be put in place. Information gaps include a list of protected species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs, their ecological coherence and the policies and measures that will be in place within these areas. Other measures are also lacking details on what they aim to achieve in terms of reduction of pressures and impacts. - All new measures will be implemented after 2016 (mainly in 2017, but also from 2018) and will thus only partially contribute to achieving GES by 2020.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of non-indigenous species from shipping (ballast water and biofouling), through measures linked to the IMO — BWMC and International Convention on the Control of Harmful Anti-fouling Systems on Ships (activities reported in Article 8). - The programme includes early detection systems of non-indigenous species introductions as measures
Weaknesses	<ul style="list-style-type: none"> - The programme does not address the introduction of non-indigenous species from port operations, tourism and recreation (activities reported as sources of non-indigenous species under Article 8). - As mentioned below in the exception section, Lithuania did not provide a fully grounded justification for the use of its exception.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species from commercial fishing. - The programme proposes fishing effort restrictions, cod stocks management plans and reductions in discarding. - The programme covers stocks managed at the national level.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the programme of measures addresses the extraction of species from recreational fishing. - Although reported in Article 8, the programme does not address shipping (unless Lithuania considers fisheries a form of shipping activity). It should be noted that it is not clear how this activity will lead to the extraction of fish. - The programme does not clearly cover all species listed in the GES and target definitions (only cod is mentioned). - Lithuania does not mention the CFP. In its programme of measures.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from sources such as agriculture and urban waste water discharge. Industry (another activity reported in Article 8) does not seem to be covered by specific measures but is likely to be addressed by general measures targeting various activities or by the national

Strengths and weaknesses	
	<p>implementation of the Baltic Sea Environmental Protection Strategy (that focuses on urban waste water treatment plants and is also likely to cover industrial activities).</p> <ul style="list-style-type: none"> - The measures for eutrophication draw from the Member State's WFD RBMPs. In the framework of the MSFD, most measures are considered likely to be sufficient to address pressures of nutrient and organic matter enrichment in the marine environment and cover relevant human activities. However, considering the extent to which the MSFD programme of measures relies on WFD measures, this statement is subject to the RBMPs, as reported in 2016, being assessed as adequate under the WFD assessment.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the programme of measures addresses atmospheric deposition of nutrients (NOx) from sea-based and land-based sources. - As mentioned below in the exception section, Lithuania did not provide a fully grounded justification for the use of its exception.
D7 — Hydrographical changes	
Strengths	None identified.
Weaknesses	<ul style="list-style-type: none"> - Lithuania does not report any measure for hydrographical changes (D7). - The programme of measures does not address hydrographical changes from marine hydrocarbon extraction, port operations, and tourism and recreation (activities reported in Article 8). - The programme for D7 does not utilise synergies with the EIA and SEA Directives, WFD, M S P Directive, UWWTD and integrated coastal zone management processes. - The programme does not explain how it will address the issue of cumulative impacts, i.e. impacts from different/multiple human activities on hydrography. - GES and targets have not been defined for hydrographical changes, it is therefore not possible to say whether the programme is sufficient for achieving GES.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses contaminant inputs to the sea from land-based (e.g. urban areas), as well as sea-based sources (e.g. port operations, solid waste disposal and shipping). Other activities, not reported under Article 8, are also covered in the programme: industry, dredging, agriculture, fisheries and marine hydrocarbon extraction. - The programme addresses accidental pollution from shipping and port operations (even though only shipping is addressed by measures which explicitly mention pollution incidents, port operations should be addressed by the more general measures aiming to reduce pollution from several activities). - Lithuania has reported the same measures for contaminants (D8) and contaminants in seafood (D9). - The programme addresses atmospheric deposition of contaminants through the implementation of the national emission ceilings Directive.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not provide enough details on how the whole list of contaminants mentioned in the GES and target definitions will be addressed.
D10 — Marine litter	

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses marine litter from land-based (e.g. tourism and recreation) and sea-based (e.g. shipping, fisheries, port operations) sources of litter. Other activities, not reported under Article 8, are also covered in the programme: urban and industrial activities. - The programme addresses the reduction of marine litter input in coastal areas and in the open sea. - Measures include awareness-raising efforts to the public, in addition to direct measures. - The programme makes links to HELCOM's Baltic Sea Action Plan and regional action plan for marine litter.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the programme of measures includes measures on the removal of existing litter (e.g. through beach cleaning campaigns). - GES and targets have not been defined for marine litter, it is therefore not possible to say whether the programme is sufficient for achieving GES. - The programme does not specifically address micro-litter.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses continuous and impulsive underwater noise from shipping, dredging and port operations. - The measures includes research efforts which aim to collect additional data to better characterise the pressure of underwater noise, and its impacts on biodiversity (e.g. marine mammals) in line with the recommendation from TG Noise. This will address knowledge gaps for underwater noise (especially impulsive noise, through the establishment of a register). - The programme includes monitoring efforts for continuous noise, which can be considered as progress on this issue.
Weaknesses	<ul style="list-style-type: none"> - The programme does not cover marine-based renewable energy generation, fisheries and submarine cable and pipeline operations, although reported in Article 8. - The programme does not address other energy inputs (such as heat or light). - GES and targets have not been defined for underwater noise, it is therefore not possible to say whether the programme is sufficient for achieving GES.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme of measures (for birds specifically) addresses the extraction of species (incidental by-catch) from fisheries. - The programme includes spatial protection measures that for example focus on bird-specific MPAs, and address various, unspecified, anthropogenic pressures. - Lithuania complements its direct measures with indirect measures on awareness raising on the impact of by-catch on birds.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not fully address other specific pressures such as physical disturbances (light pollution), effects of non-indigenous species on seabirds, the disturbance of nesting sites by predation and birds' food sources and litter ingestion. It is possible that these are addressed by the measures for non-indigenous species (D2), marine litter (D10) and underwater noise and energy (D11), for example, but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors

Strengths and weaknesses	
	<p>will benefit from these measures.</p> <ul style="list-style-type: none"> - The programme does not specify the bird species that are addressed by the measures. - The programme only indirectly addresses impacts of oil spills on birds, through monitoring efforts, although this pressure is mentioned in the GES and target definitions.
D1, 4 — Fish	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes general spatial protection measures relevant for all species and habitats. - The programme (for fish specifically) addresses by-catch of non-commercial, but also and mainly commercial, species by commercial fishing. - The programme addresses other pressures on fish such as eutrophication and contaminants through general biodiversity measures and links between the measures reported for eutrophication (D5) and for food webs (D4)/biodiversity (D1).
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address other specific pressures such as introductions of non-indigenous species and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2) and marine litter (D10) but based on the information reported this cannot be determined. - The programme mainly focuses on commercial fish (only one measure clearly mentions non-commercial fish). - As mentioned below in the exception section, Lithuania did not provide a fully grounded justification for the use of its exception.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes general spatial protection measures relevant for all species and habitats. - The programme addresses specific pressures on mammals such as incidental by-catch from fisheries, contaminants and eutrophication (also through links between the measures reported for eutrophication and for food webs/biodiversity). - The programme includes a measure to mitigate the impact of some pressures on mammals (rehabilitation centres). - Lithuania complements its direct measures with indirect measures on awareness raising on the impact of incidental by-catch on mammals.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address specific pressures such as collisions with ships, marine litter and underwater noise. It is possible that these are partly addressed by the measures for marine litter (D10) and underwater noise (D11) but based on the information reported this cannot be determined. - The programme for mammals specifically lacks details, which leaves a large uncertainty on which pressures and activities are covered and to what extent. - Lithuania's programme does not specify the mammal species that are addressed by the measures. - GES and targets have not been defined for mammals, it is therefore not possible to say whether the programme is sufficient for achieving GES.
D1, 4 — Water column habitats	

Strengths and weaknesses	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes specific measures relevant for water column habitats. - The programme addresses pressures such as nutrient enrichment through links to the measures reported for eutrophication (D5), the implementation of the Nitrates and Sewage Sludge Directives, and more specific measures (best practices in the use of fertilisers for agriculture in this area, and removal of nutrients from the Curonian Lagoon) and contaminants through general biodiversity measures (no link has been mentioned to the measures reported under D8 — Contaminants).
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address other relevant pressures, such as non-indigenous species and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2) and marine litter (D10) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures. - The programme for water column habitats lacks details on measures addressing pressures beyond the Curonian lagoon. - Even though the programme indirectly addresses plankton communities through measures addressing eutrophication, no clear link is made from the reported measures to their effect on zooplankton populations. The water column is mainly covered in terms of water quality and plankton is a key feature of the monitoring programmes (which is rarely referenced in the biodiversity measures). Additionally, the water column is a key transfer route for most non-seabed species and needs to be considered as part of the broader ecological coherence of waters, within MPAs and in relation to food webs. - As mentioned below in the exception section, Lithuania did not provide a fully grounded justification for the use of its exception.
D1, 4, 6 — Seabed habitats	
Strengths	None identified.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address physical loss and damage from dredging and port operations and physical damage from fisheries (although reported under Article 8). - The programme for seabed habitats only indirectly addresses bottom-trawling (through research and monitoring efforts). - Dredging a certain area was proposed as a measure for eutrophication (D5) to promote denitrification. - The programme for seabed habitats includes measures aiming to reduce and prevent impacts from various human activities but lacks specific details, which leaves a large uncertainty on which pressures and activities are covered and to what extent. - The programme does not address other relevant pressures on seabed habitats such as non-indigenous species, eutrophication and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication (D5) and marine litter (D10) but based on the information reported this cannot be determined. - The programme does not include specific spatial protection measures for seabed habitats.

Strengths and weaknesses

Exceptions

Lithuania applies an exception for non-indigenous species (D2). It applies Article 14(1)(e) ‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’. Lithuania explains that non-indigenous species from other Baltic Sea countries may naturally spread to Lithuanian waters and cause environmental issues. However, Lithuania did not provide sufficient detail for the exception.

This assessment finds the justification of the exception only partially grounded. Transboundary impact is indeed a very relevant problem in the case of non-indigenous species, for which international and regional cooperation is required. This justification could also correspond to Article 14(1)(a) ‘action or inaction for which the Member State concerned is not responsible’, although Lithuania only applies Article 1(e) in this case. The Member State also did not specify when GES is expected to be achieved (in relation to Article 14(1)(e)).

Lithuania applies an exception for eutrophication (D5). It applies Article 14(1)(e) ‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’. Lithuania explains that the increase in phosphorus content in open sea is more determined by flows from deep areas of the Baltic Sea (which depends on the intensity of inflow of North Sea waters) than flows from continental part (e.g. riverine), which limits the possibilities to achieve GES. Also, the pollution load reduction that Lithuania should achieve to meet HELCOM’s requirements is considered by Lithuania to be too high (more than 50%), and, as such, not technically feasible, because currently waste waters in Lithuania are mostly treated to required standards and agricultural practices within Lithuania do not lead to significant pollution with phosphorus. Finally, achieving HELCOM’s objectives for reductions in nutrient input levels, without a contribution from its neighbouring inland country Belarus, is not considered possible because this would require large and disproportional cuts in phosphorus input loads by Lithuania. This assessment finds the justification of the exception partially grounded. It will take a significant time before positive results from reductions in nutrient input loads can be measured and effects become noticeable, due to the natural conditions of the Baltic Sea (historical contamination and slow exchange of water with the North Sea). However, the HELCOM nutrient reduction scheme has been politically endorsed at Ministerial level in 2013.

The Member State also did not specify when GES is expected to be achieved (in relation to Article 14(1)(e)).

Lithuania applies an exception for contaminants and contaminants in seafood (D8/9). It applies Article 14(1)(a) ‘action or inaction for which the Member State concerned is not responsible’ and Article 14(1)(e) ‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’. Lithuania considers itself not solely responsible for contaminants entering into the Baltic Sea, as there are pollutants and fish caught for consumption arriving also from other areas, e.g. Belarus. Also, some compounds, such as heavy metals, are released from marine sediments, which means that natural conditions might also explain the state of the Baltic Sea.

This assessment finds the justifications of the exception to be grounded. Contaminant pollution indeed has transboundary characteristics, and Lithuania alone cannot be held responsible for this issue. Given the natural conditions of the Baltic Sea, some contaminants (such as heavy metals) are persistent and take a long time to break down in the marine environment.

The Member State also did not specify when GES is expected to be achieved (in relation to Article 14(1)(e)).

Strengths and weaknesses

Lithuania applies an exception for food webs (D4). It applies Article 14(1) (e) ‘natural conditions which do not allow timely improvement in the status of the marine waters concerned’. Since Lithuania considers GES for birds and seabed habitats achievable by 2020, and that no GES was defined for mammals, this exception was taken to apply solely to fish (D1, 4) and water column habitats (D1, 4). Lithuania explains that achieving national Objective 2 (associated to D1, 4, which also has impacts on D5) is closely related to the achievement of national Objective 3 (associated to D5, which also has impacts on D4) and national Objective 4 (associated with non-indigenous species). Lithuania therefore explains that the exception applied for food webs is linked to eutrophication (D5) for which another exception has been applied (related to national Objective 3) and assessed as ‘partially grounded’ under eutrophication (D5). An exception has also been applied to Objective 4 and assessed as ‘partially grounded’ under non-indigenous species (D2).

This assessment finds the justification for the exception to not be grounded. No details are provided, and no explanation is reported to justify the application of this explanation (beyond the link to other descriptors). As such, there is no basis to assess this exception.

The Member State also did not specify when GES is expected to be achieved (in relation to Article 14(1)(e)).

Recommendations for Lithuania to consider in its programme of measures:

Recommendations

General

- In general, Lithuania should better address certain pressures and activities. These are specified in the descriptor-specific recommendations below in its programme of measures.
- The Member State should consider whether it is feasible to reduce the current levels of certain pressures on the marine environment (e.g. non-indigenous species, contaminants, marine litter), given that the majority of direct measures focus on preventing ongoing and future inputs of pressures.
- GES and target definitions should be better addressed for commercial fish and shellfish (D3), contaminants and contaminants in seafood (D8/9), birds (D1, 4), fish (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6).
- If GES is not expected to be achieved by 2020 (e.g. for D2 — Non-indigenous species, D5 — Eutrophication, D8/9 — Contaminants and contaminants in seafood, D4 — Food webs (the assessment assumes it only concerns fish and water column habitats (D1, 4)), then the Member State should estimate the alternative dates by when GES will be achieved.
- The Member State should make additional links to existing European policies as well as regional instruments (especially for commercial fish and shellfish and contaminants in seafood).
- The Member State should provide the spatial scope of all its measures (i.e. whether they apply to WFD coastal waters, territorial waters, exclusive economic zone, etc.).
- The Member State should quantify pressures and their expected reduction as a result of the established measures. This could be facilitated by further efforts to address knowledge gaps and define the methodology for such estimations at regional or EU level. Such quantification will also contribute to linking the measures with the achievement of GES.
- The Member State should provide more information about what its measures aim to achieve

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<p>in terms of reduction of pressures and impacts, and also on its spatial protection measures (which species and habitats are protected within the MPAs, size, number and location of MPAs, the conservation objectives of the MPAs, ecological coherence and the policies and measures that will be in place within these areas).</p> <ul style="list-style-type: none"> - The Member State should ensure better linkages between its programme of measures and monitoring programmes, in order to ensure that the effects of the measures, and hence their efficiency and effectiveness in meeting targets and GES, are measured through the Monitoring Programmes. - The Member State should report data collection efforts under the MSFD monitoring programmes (Article 11) and not under the programme of measures (Article 13). However, when knowledge is too scarce to design effective measures, it is useful to indicate actions taken to address these gaps via research measures.
D2 — Non-indigenous species
<ul style="list-style-type: none"> - Lithuania's programme should address the introduction of non-indigenous species into its marine waters from port operations, tourism and recreation. - The Member State should justify the exception, for not achieving GES by 2020 in the case of non-indigenous species (D2), more robustly and scientifically.
D3 — Commercial fish and shellfish
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to cover the extraction of species from shipping (and explain how this activity will lead to the extraction of fish) and recreational fishing (or, if this is already the case, provide more details). - The Member State should better explain whether all species listed in the GES and target definitions are covered by the measures. - Lithuania's programme of measure should better link with the CFP.
D5 — Eutrophication
<ul style="list-style-type: none"> - The Member State should clearly address atmospheric deposition of nutrients (NO_x) from sea-based and land-based sources. - The Member State should more robustly and scientifically justify the exception for not achieving GES by 2020 in the case of eutrophication (D5).
D7 — Hydrographical changes
<ul style="list-style-type: none"> - Lithuania should establish specific measures for hydrographical changes (D7) to address the pressure of hydrographical changes and cover the activities reported as sources of this pressure in Article 8 (marine hydrocarbon extraction, port operations, and tourism and recreation). - The Member State should utilise synergies with the EIA and SEA Directives, WFD, MSP Directive, UWWTD and integrated coastal zone management processes. - Lithuania's programme should address cumulative impacts. - The Member State should define GES and targets for hydrographical changes.
D8/9 — Contaminants and Contaminants in seafood
<ul style="list-style-type: none"> - The Member State should cover the whole list of contaminants mentioned in the GES and target definitions (or, if this is already the case, provide more details).
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to remove existing litter (e.g. through beach cleaning campaigns), or, if this is already the case, provide more details.

Recommendations
<ul style="list-style-type: none"> - The programme should address micro-litter. - The Member State should develop efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.). - The Member State should define GES and targets for marine litter.
D11 — Underwater noise and energy
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to directly cover marine-based renewable energy generation, fisheries and submarine cable and pipeline operations. - The Member State should consider establishing measures that target other energy inputs, if relevant (e.g. heat, light). - Lithuania should define GES and targets for underwater noise.
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to directly address pressures on birds, such as physical disturbances (light pollution), disturbances on nesting sites by predation, effects of non-indigenous species and litter ingestion, as well as measures covering birds' food sources. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on birds should be explained. - The Member State should clearly explain which species are covered by the measures, and consider establishing additional measures targeting other specific bird species, if these are not already covered by the programme of measures. - The Member State should consider establishing additional measures to directly address impacts of oil spills on birds, as specified in the GES and targets definitions.
D1, 4 — Fish
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures (including spatial protection measures to protect non-commercial fish species) to directly address pressures on fish, such as from introductions of non-indigenous species and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on fish should be explained. - The Member State should consider establishing additional measures specifically focusing on non-commercial fish. - The Member State should justify the exception for not achieving GES by 2020 in the case of food webs (D4, see description of the exception above), more robustly and scientifically.
D1, 4 — Mammals
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to further address relevant pressures on mammals such as impacts on mammals due to shipping (collision), marine litter and underwater noise. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on mammals should be explained. - The Member State should report more details about its measures to clearly understand which pressures and activities are covered and to what extent. - The Member State should consider establishing additional measures targeting specific mammal species, or clearly explain which species are covered by the measures. - The Member State should define GES and targets for mammals.
D1, 4 — Water column habitats
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to tackle some

Recommendations

pressures associated with water column habitats, especially beyond the Curonian lagoon, such as non-indigenous species and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on water column habitats should be explained.

- The Member State should clearly cover plankton populations in its measures.
- The Member State should justify the exception for not achieving GES by 2020 in the case of food webs (D4, see description of the exception above), more robustly and scientifically.

D1, 4, 6 — Seabed habitats

- The Member State should consider establishing additional measures, including spatial protection measures, covering fisheries (especially directly reducing the impact of bottom trawling), dredging and port operations as well as other activities potentially destructive to seabed habitats.
- The Member State should avoid promoting dredging operations for denitrification, considering the impacts this activity has on seabed habitats.
- The Member State should report more details about its measures to clearly understand which pressures and activities are covered and to what extent.
- If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D2 — Non-indigenous species, D5 — Eutrophication, D10 — Marine litter), the expected effect that measures are to have on seabed habitats should be explained.
- The Member State should consider establishing additional spatial protection measures and provide details on protected areas (and MPAs) such as their area of coverage or temporal ranges of restrictions. The Member State should provide timescales and estimates of how spatial restrictions of seabed-damaging activities will allow for GES to be achieved.

6. Romania

General conclusions on Romania's programme of measures

Strengths and weaknesses	
General	
Strengths	<ul style="list-style-type: none"> - Romania's programme of measures addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7) (only GES since no target has been defined for D7), birds (D1, 4) and mammals (D1, 4). - The programme of measures includes measures that are based on commitments to existing European and regional policies, such as Directives 2014/52/EU (EIA) and 2001/42/EC (SEA; all descriptors), the Common Fisheries Policy (all descriptors), the Maritime Spatial Planning Directive (all descriptors), the Bucharest Convention (D1, 4, 6; D5; D8; D10), the Habitats Directive (D1, 4, 6; D2; D3; D10; D11), the Birds Directive (D1, 4, 6; D3), the WFD (D1, 4, 6; D5; D7; D8; D10), Regulation (EC) No 708/2007 concerning use of alien and locally absent species in aquaculture (D2), Regulation (EU) No 1143/2014 on the prevention and management of the introduction and spread of invasive alien species (D2), Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy (D3), the National Emission Ceilings Directive (D5; D8), Directive 2010/75/EU on industrial emissions (D5; D8), the Nitrates Directive (D5; D8), Directive 2000/59/EC on port reception facilities (as amended by Directive 2015/2087; D5; D8; D10), the UWWTD (D5; D8; D10), the Waste Framework Directive (2008/98/EC; D5; D8; D10), Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs (D9), Directive 2013/39/EC on priority substances in the field of water policy (D9), as well as international instruments such as Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS, D1, 4, 6), the International Maritime Organisation's (IMO) — Guidelines for the control and management of ships' biofouling (D2), IMO — International Convention for the Prevention of Pollution from Ships (MARPOL) (D5; D8; D10), IMO — Ballast Water Management Convention (D2). - The programme includes new measures that complement those already in place and specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures (including MPAs). These measures address several descriptors (D1, 4, 6 — Biodiversity, D3 — Commercial fish and shellfish, D7 — Hydrographical changes) and therefore contribute towards GES and targets for these descriptors. Measures aim to

Strengths and weaknesses	
	<p>develop the network of protected areas and their management plans, regulate activities in MPAs and other specific areas (e.g., coastal zone, Black Sea below the 20 m isobath, mouth of the Danube, Chilia branch), especially fisheries and the use of gillnets, map habitats and develop studies to analyse the impact of trawling on the marine environment.</p> <ul style="list-style-type: none"> - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment while simultaneously implementing measures which complement the direct measures through governance and coordination actions, as well as awareness raising and research efforts. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (i.e. D2; D5; D8; D11), the Member State reports research efforts. This will allow knowledge gaps to be addressed, but also to build upon the results to enable the design of measures which will contribute directly to tackling the pressures in the MSFD's second implementation cycle. - Based on the information reported by the Member State on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the programme is likely to be implemented. The new measures will, however, only partially contribute to reaching GES by 2020, as their implementation is too late to have the full impact needed. The detailed analysis and planning of the measures, including the cost-benefit analysis, is nevertheless positive, as it indicates Romania's substantial commitment to the eventual implementation of its programme of measures. - The programme emphasises regional cooperation and makes several links to efforts developed with Bulgaria.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures only partially addresses GES and targets for contaminants (D8), contaminants in seafood (D9), marine litter (D10), fish (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - No conclusion can be provided regarding whether or not GES and targets are addressed for underwater noise (D11). - Romania has not yet provided target definitions for hydrographical changes (D7) and underwater noise (D11). - Romania considers that GES will not be fully achieved by 2020 for non-indigenous species (D2), commercial fish and shellfish (D3) and marine litter (D10) (see exceptions below). - Romania does not report when it considers that GES will be achieved for any descriptor. - In some rare cases, the programme does not include sufficient links to existing European policies as well as regional instruments. This is especially the case for D11. - The spatial scope of the measures is only detailed for the new measures (not the existing ones). - While impact assessments were carried out for new measures, the results do not allow for a quantification of what the measures are expected to achieve; i.e. to what extent the relevant pressure will be addressed, and whether the

Strengths and weaknesses	
	<p>measures will be sufficient to achieve GES.</p> <ul style="list-style-type: none"> - Romania does not make sufficient links between the measures for the pressure descriptors (except D3 — Commercial fish and shellfish) and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This prevents understanding of how state descriptors benefit from measures which are likely to contribute in addressing pressures on species and habitats. - The programme sometimes includes data collection efforts as measures, rather than putting this under its monitoring programmes (Art. 11). - The programme includes spatial measures that do not always provide clear and specific information on the management efforts in place (or to be implemented in the future). Information gaps include the size and location of MPAs and the conservation objectives of the MPAs.
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of non-indigenous species from shipping, especially ballast water (measures linked to the implementation of the BWMC and IMO Guidelines for the control and management of ships' biofouling), but hull fouling is only covered through monitoring efforts. - The programme also addresses the introduction of non-indigenous species from aquaculture and fishing (possible sources of non-indigenous species that were not reported by Romania in Article 8). - The programme includes the development of a regional early detection system of non-indigenous species introductions as a measure.
Weaknesses	None identified
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - Romania's programme of measures addresses the extraction of species by commercial fishing, including from vessels larger than 12 m with mobile, seabed-affecting gears, and is also likely to cover recreational fishing. - The programme proposes spatio-temporal fishing bans (for several purposes, including stock management and biodiversity conservation) and other restrictions of several fishing tools that are in addition to existing CFP measures. - The programme covers stocks managed at the national level and includes aspects that relate to age/size structure of species. - The programme includes awareness-raising efforts that complement the direct measures.
Weaknesses	- The programme of measures has not been linked to the GFCM.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from sources such as agriculture, urban activities and industry. - The programme addresses nutrient inputs from other sources such as shipping, port operations, offshore activities, tourism and recreation (sources of nutrients that were not reported in Article 8). - The measures for eutrophication draw from Member State's WFD RBMPs. In the framework of the MSFD, most measures are considered likely to be

Strengths and weaknesses	
	<p>sufficient to address pressures of nutrient and organic matter enrichment in the marine environment and cover relevant human activities. However, considering the extent to which the MSFD programme of measures relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment.</p> <ul style="list-style-type: none"> - The programme addresses atmospheric deposition of nutrients from several sources but only indirectly through research and monitoring efforts (link to the National Emission Ceilings Directive).
Weaknesses	None identified (except the lack of timeline for the achievement of GES mentioned above).
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses hydrographical changes from coastal defence and dredging. - The programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisations and regulatory procedures are addressed in terms of hydrographical changes. - The programme utilises synergies with the WFD, EIA and SEA (and MSP through horizontal measures). - The programme is likely to address the issue of cumulative impacts, although not expressly cited (e.g. SEA, MSP), i.e. impacts from different/multiple human activities on hydrography.
Weaknesses	<ul style="list-style-type: none"> - None identified (except the lack of targets for hydrographical changes (D7) mentioned above).
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses contaminant inputs to the sea from land-based (e.g. industry, urban areas, agriculture), as well as sea-based (e.g. shipping, solid waste disposal, port operations) sources. - The programme addresses accidental pollution from industry, urban areas, shipping and port operations (even though no measure specifically addresses industry and urban areas, they are very likely to be covered by measures addressing the introduction of contaminants from these sources as presented above). - The programme addresses atmospheric deposition of contaminants from several sources but only indirectly through research and monitoring efforts (link to the National Emission Ceilings Directive). - The programme includes one specific measure for contaminants in seafood (D9).
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address contaminant inputs to the sea from marine hydrocarbon extraction. - The Member State does not clearly explain how measures for contaminants (D8) will contribute to addressing pressures for contaminants in seafood (D9) and allow for progress towards D9 GES and targets.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses marine litter from land-based (e.g. tourism and recreation, port operations) and sea-based (e.g. shipping,

Strengths and weaknesses	
	<p>fisheries) sources of litter.</p> <ul style="list-style-type: none"> - The programme contains measures addressing the reduction of marine litter input in coastal areas and in the open sea. - The programme includes awareness-raising efforts, in addition to direct measures. - The programme addresses micro-litter/degradation products (through the reduction of plastic waste accumulation). - Transboundary impacts of marine litter are acknowledged by Romania, who calls for regional implementation of measures against marine litter.
Weaknesses	<ul style="list-style-type: none"> - Romania's programme does not include any measure focusing on riverine sources of litter, and especially the Danube River, even though Romania recognises that the Danube River has an important influence on the ecological status of the Black Sea marine ecosystem. - The programme of measures only indirectly covers urban activities (no detailed waste management or waste water treatment plan for land-based activities could be found among Romania's measures for marine litter). - As mentioned below in the exception section, Romania did not provide a fully grounded justification for the use of its exception.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses underwater noise from tourism, fishing and shipping, as well as port operations to some extent. - The programme includes research efforts which aim to collect additional data to better characterise the pressure of underwater noise, and its impacts on the marine environment, in line with recommendations from TG Noise. This will address knowledge gaps for underwater noise (especially impulsive noise, through the establishment of a register).
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether the programme of measures addresses other energy inputs (such as heat or light).
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species (incidental by-catch) from fisheries, as well as the impacts on seabird habitats and populations from a wide variety of pressures and activities, such as pollution, non-indigenous species and littering from industry, shipping and urban areas, but mainly within protected areas. - The programme targets specific bird species and habitats. - The programme includes general spatial protection measures that contribute to tackle the pressures on the marine environment (e.g., non-indigenous species, contaminants, marine litter) in combination with measures which have a wider application in the marine waters.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures (for birds specifically) does not address other specific pressures on birds, such as the disturbance of nesting sites by predation and birds' food sources, or pollution, non-indigenous species and littering beyond protected areas. It is possible that relevant pressures on birds are addressed by the measures for non-indigenous species (D2), contaminants (D8) and marine litter (D10) but based on the information reported this cannot

Strengths and weaknesses	
	be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species (incidental by-catch) by commercial fishing. - The programme includes measures on fishing restrictions and size limits in the Romanian part of the Black Sea. - The programme includes general spatial protection measures that contribute to tackle the pressures on the marine environment (e.g., non-indigenous species, contaminants, marine litter from several activities such as aquaculture, shipping and tourism) in combination with measures which have a wider application in the marine waters. - The programme of measures for commercial fish (D3) has often been linked to the programme of measures for non-commercial species (D1, 4) (common measures have been reported for both descriptors).
Weaknesses	<ul style="list-style-type: none"> - The programme does not include any specific measure on the <i>Gobiidae</i> family (species mentioned in the GES and targets definitions). - The programme (for fish specifically) does not address specific pressures on fish such as non-indigenous species, contaminants or marine litter beyond protected areas. It is possible that relevant pressures on fish (other than commercial fisheries) are addressed by the measures for non-indigenous species (D2), contaminants (D8) and marine litter (D10) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4 — Mammals	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses pressures such as incidental by-catch from fishing activities, as well as collisions with ships. - The programme includes general spatial protection as well as spatial protection measures that specifically target mammal species, and that contribute to tackle contaminants, seabed erosion, underwater noise and marine litter from several activities such as tourism, discharges from urban areas (waste water treatment), dredging, hydrocarbon extraction, shipping, aquaculture and fishing, in combination with measures which have a wider application in the marine waters.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address specific pressures on mammals such as contaminants, marine litter and underwater noise beyond those taken in protected areas. It is possible that relevant pressures on mammals are addressed by the measures for contaminants (D8), marine litter (D10) and underwater noise (D11) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures.
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses pressures on water column habitats such as contaminants, hydrographical changes and nutrient enrichment from various activities, but only through general biodiversity and spatial protection

Strengths and weaknesses	
	measures.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not include specific measures on water column habitats or make links to relevant measures under other descriptors. It is possible that relevant pressures on water column habitats are addressed by the measures for non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures. - It is not clear whether or not the programme directly addresses phytoplankton and zooplankton communities. The water column, although considered in other descriptors, is mainly covered in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which is rarely referenced in the biodiversity measures. Additionally, the water column is a key transfer route for most non-seabed species and needs to be considered as part of the broader ecological coherence of waters, within MPAs and in relation to food webs.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses physical damage of the seafloor from fisheries (within and outside protected areas), dredging and land claim/coastal defence. - The programme addresses other activities potentially destructive to seabed habitats, such as submarine cable and the extraction of genetic resources/bioprospecting.
Weaknesses	<ul style="list-style-type: none"> - Even though a set of measures providing spatial protection addresses other activities reported in Article 8, such as port operations, tourism/recreational activities and shipping, these are not covered beyond protected areas. - The Member State addresses various anthropogenic impacts on seabed habitats through spatial protection measures, including trawling restrictions, but these are often lacking detail on their area coverage and temporal ranges of restrictions. - The majority of pressures in the programme relate to physical loss and damage to seabed habitat, with minimal consideration of other pressures, such as non-indigenous species, eutrophication and marine litter, beyond protected areas. It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication (D5) and marine litter (D10) but based on the information reported this cannot be determined.
Exceptions	
<p>Romania applies an exception for non-indigenous species (D2). It applies Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible'). Romania reports that various non-indigenous species identified in its marine waters arrived through the Bosphorus Strait. Control and management of this source of introductions cannot be done solely through the Romanian measures (since the Member State is not responsible for the management of marine areas around the Bosphorus Strait) but requires regional cooperation, given the transboundary effects (it should be noted that Romania includes two new measures in its programme of measures that involve a bilateral coordination with Bulgaria, on a joint</p>	

Strengths and weaknesses

action plan for early detection, mitigation and impact assessment of non-indigenous species and the update of the list of marine non-indigenous species in the Black Sea; these measures are also linked to several pieces of legislation, including IMO's resolution MEPC 207(62) on ship's biofouling).

The assessment finds the justification provided by Romania to be grounded. The transboundary effect of non-indigenous species introduced in the Black Sea through the Bosphorus Strait might prevent the achievement of GES by 2020. The measures put in place by Romania alone will be insufficient to address the problem and a regional approach is likely to be more effective.

Romania applies an exception for commercial fish and shellfish (D3). It applies Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible'). Romania reports that the achievement of the targets on fishing mortality and spawning stock biomass that reflect the maximum sustainable yield for fish species that are shared at regional level depends on the concerted management of fishing activities by all Black Sea riparian countries. Stocks are shared with other states across the whole marine region, the majority of which are not EU Member States, and status for commercial fish and shellfish (D3) therefore depends on the action taken by all Black Sea countries. Still, Romania is making efforts to manage fisheries sustainably on a local, sub-regional (joint Romanian-Bulgarian actions) and regional (through the new measure MN-017 on multi-annual regional management plans) level and these measures are expected to contribute to the achievement of GES and targets within its waters.

The assessment finds the justification provided by Romania to be grounded. Achieving the targets in respect to the management of a shared fish stock depends on the measures put in place by neighbouring countries.

Romania applies an exception for marine litter (D10). It applies Article 14(1)(a) ('action or inaction for which the Member State concerned is not responsible'). It refers to the transboundary nature of marine litter, including micro-litter. Romania stated that the measures for marine litter (D10) do not cover micro-plastics because information on micro-plastics in the marine environment is still too limited, which hinders the assessment of its status and the identification of suitable measures. It added that efforts will be undertaken to increase the knowledge base, especially regarding the amount of litter originating from other countries. The programme of measures will then be updated, including the exceptions, especially after the approval and implementation of the Regional Action Plan on Marine Litter Management for the Black Sea (adopted on 24-25 October 2018) and the Guidelines for Marine Litter Monitoring in the Black Sea (not yet adopted).

The assessment finds the justification provided by Romania to be partially grounded. The transboundary effect of litter (including micro-litter) and the lack of knowledge on the issue can be expected to prevent the achievement of GES by 2020. Regional efforts are needed to find solutions. Romania does not report whether or not it has identified (or even quantified) the amount of litter coming from neighbouring Member States through monitoring efforts, which would represent the basis for such an exception. Romania also did not put in place research measures to start filling knowledge gaps about marine litter, and especially micro-litter.

Recommendations for Romania to consider in its programme of measures:

Recommendations
General
<ul style="list-style-type: none"> - In general, the Romania's programme of measures should better address certain pressures and activities. These are specified in the descriptor specific recommendations below. - The Member State should consider whether it is feasible to reduce the current levels of certain pressures in the marine environment, given that the majority of direct measures focus on preventing ongoing and future inputs of pressures. While most measures aim to address ongoing and new inputs of pressures, very few seek to remove or reduce what is already present in the marine environment due to past activities (e.g. marine litter, non-indigenous species, contaminants). - GES and target definitions should be better addressed for contaminants (D8), contaminants in seafood (D9), marine litter (D10), underwater noise (D11), fish (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - The Member State should provide target definitions for hydrographical changes (D7) and underwater noise (D11). - The Member State should strive to determine the timelines for achieving GES for all descriptors. - The Member State should establish more links with existing EU policies and international agreements (for D11). This would improve the overall coherence and coverage of the programme of measures. - Romania should define the spatial scope of all measures in detail in its programme. - The Member State should quantify pressures and their expected reduction as a result of the established measures. This could be facilitated by further efforts to address knowledge gaps and define the methodology for such estimations at regional or EU level. Such quantification will also contribute to linking the measures with the achievement of GES. - The Member State should make better links between the measures reported for pressure descriptors (except D3 — Commercial fish and shellfish) and their effects on the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This would allow a comprehensive view of the impact of measures affecting all descriptors. - The Member State should report data collection efforts under its MSFD monitoring programmes (Article 11) and not under the programme of measures (Article 13). However, when knowledge is too scarce to design effective measures, it is useful to indicate actions taken to address these gaps via research actions (measures). - The Member State should ensure better linkages between its programme of measures and monitoring programmes, in order to ensure that the effects of the measures, and hence their efficiency and effectiveness in meeting targets and GES, are measured through the Monitoring Programmes. - The Member State should provide more information about its spatial protection measures (size, number and location of MPAs and the conservation objectives of the MPAs).
D3 — Commercial fish and shellfish
<ul style="list-style-type: none"> - The Member State should link its programme of measures to the GFCM, which would help ensure coherence at the regional level.
D5 — Eutrophication
<ul style="list-style-type: none"> - In its programme, Romania should address atmospheric deposition better, through direct

Recommendations
measures (it is noted that Romania has already stated that it plans to introduce such measures for the second MSFD cycle).
D8/D9 — Contaminants and Contaminants in seafood
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to address contaminant inputs to the sea from marine hydrocarbon extraction. - The programme should better explain the manner in which the measures for contaminants (D8) contribute to D9 GES and targets. - The Member State should address atmospheric deposition better, through direct measures (it is noted that Romania has already stated that it plans to introduce such measures for the second MSFD cycle).
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures for marine litter (D10) focusing on riverine sources of litter, especially the Danube River, which has an important influence on the ecological status of the Black Sea marine ecosystem, as well as urban activities (waste management or waste water treatment plan). - Romania should make efforts to identify pollution hot spots (e.g. from plastic pellets, lost fishing gear, etc.). - The Member State should justify the exception for not achieving GES by 2020 in the case of marine litter (D10), more robustly and scientifically.
D11 — Underwater noise and energy
<ul style="list-style-type: none"> - The Member State should address data gaps (especially for continuous noise since Romania has established a register for impulsive noise) and consolidate research results to move closer to characterising the noise pressure, in line with the recommendation of TG Noise. This will enable defining more specific and direct measures to address underwater noise in the second MSFD implementation cycle. - The Member State should consider establishing measures that target other energy inputs where relevant (e.g., heat, light).
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to address the disturbances on nesting sites by predation, as well as pollution, non-indigenous species and littering beyond protected areas. If these latter pressures are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on birds should be explained.
D1, 4 — Fish and cephalopods
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures focusing on the <i>Gobiidae</i> family (as these fish species are mentioned in its GES and target definitions). - The Member State should consider establishing additional measures to address non-indigenous species, contaminants or marine litter beyond protected areas. If these pressures are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on fish should be explained. - The Member State should provide better information on existing MPAs and the level of protection they provide for fish (commercial and non-commercial), in relation to where fish species occur within Member States' waters, and how they are protected.
D1, 4 — Mammals
<ul style="list-style-type: none"> - The Member State should consider establishing additional measures to address relevant

Recommendations
<p>pressures on mammals beyond protected areas (e.g. contaminants, marine litter, underwater noise). If these pressures are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on mammals should be explained.</p>
D1, 4 — Water column habitats
<ul style="list-style-type: none"> - The Member State should consider establishing dedicated measures on water column habitats and to tackle some pressures associated with these habitats beyond protected areas, such as non-indigenous species (D2), eutrophication (D5), contaminants (D8) and marine litter (D10). If these pressures are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on water column habitats should be explained. - The Member State should clearly state whether plankton populations are covered in its measures.
D1, 4, 6 — Seabed habitats
<ul style="list-style-type: none"> - The Member State should consider establishing measures beyond protected areas to cover port operations, tourism and shipping (as reported in Article 8). - Romania should provide more details on spatial protection measures (and MPAs) such as their area of coverage or temporal ranges of restrictions. The Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D2; D5; D10), the expected effect that measures are to have on seabed habitats should be explained.

7. Slovenia

General conclusions on Slovenia's programme of measures

Strengths and weaknesses	
General	
Strengths	<ul style="list-style-type: none"> - Slovenia's programme of measures addresses GES and targets for non-indigenous species (D2), commercial fish and shellfish (D3), eutrophication (D5), hydrographical changes (D7), contaminants (D8), contaminants in seafood (D9), marine litter (D10), underwater noise (D11) and mammals and reptiles (D1, 4). - The Member State considers that GES is already achieved for eutrophication (D5), and GES will be achieved by 2020 for hydrographical changes (D7), contaminants in seafood (D9), underwater noise (D11) and biodiversity (D1, 4, 6). - The programme includes measures that are based on commitments to existing European and regional policies, such as the Habitats Directive (D1, 4, 6; D3; D7), the Birds Directive (D1, 4, 6; D3; D7), the Common Fisheries Policy (D1, 4, 6; D3; D7), the Maritime Spatial Planning Directive (all descriptors), the integrated coastal zone management (all descriptors), the WFD (D1, 4, 6; D3; D7; D5; D8), Barcelona Convention (UNEP/MAP; D1, 4, 6; D3; D7; D10 (including the Regional Action Plan on marine litter)), the General Fisheries Commission for the Mediterranean (GFCM; D1, 4, 6; D3; D7), Directive 2014/52/EU (EIA) (all descriptors), Regulation (EU) No 1143/2014/EU on the prevention and management of the introduction and spread of invasive alien species (D2), the Nitrates Directive (D5), the UWWTD (D5), the Environmental Quality Standards Directive (D8), Regulation (EC) No 1907/2006 on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) (D8), Regulation (EC) No 1881/2006 setting maximum levels for certain contaminants in foodstuffs (D9), Directive 2000/59/EC on port reception facilities and Directive 94/62/EC on packaging and packaging waste (D10), as well as international instruments such as the International Maritime Organisation's (IMO) — International Convention for the Prevention of Pollution from Ships (MARPOL) (D10), IMO — Ballast Water Management Convention (D2), IMO — International Convention on the Control of Harmful Anti-fouling Systems on Ships (D8), IMO — Recommendations for the reduction of the underwater noise of commercial navigation as a harmful effect on marine organisms (MEPC.1 / Circ.833; D11), Agreement on the Conservation of Cetaceans of the Black Sea, Mediterranean Sea and contiguous Atlantic area (ACCOBAMS, D1, 4, 6; D3; D7). - The programme includes both existing, and new measures that complement those already in place and specifically target pressures on the marine environment which were not otherwise covered. - The programme includes spatial protection measures (including MPAs). These measures especially address several descriptors (D1, 4, 6; D3; D7) and therefore

Strengths and weaknesses	
	<p>contribute towards GES and targets for these descriptors. Measures aim to develop the network and improve the management of protected areas, protect the seabed from damages, prevent hydromorphological stress of the sea coast, map habitats, and limit the speed of vessels.</p> <ul style="list-style-type: none"> - The programme combines direct and indirect measures, thus directly addressing pressures on the marine environment while simultaneously implementing measures which complement the direct measures through governance and coordination actions, as well as awareness raising and research efforts. - In this first implementation cycle of the MSFD, in relation to descriptors for which knowledge gaps exist (especially D1, 4, 6; D8; D9; D10;), the Member State reports research efforts. This will allow knowledge gaps to be addressed, but also to build upon the results to enable the design of measures which will contribute directly to tackling the pressures in the MSFD's second implementation cycle. - The Member State makes links between the measures for the pressure descriptors and how they might benefit the state descriptors (i.e. biodiversity descriptors D1, 4, 6). This enables to understand how state descriptors benefit from these measures, which are likely to contribute in addressing pressures on species and habitats. - Slovenia reports the implementation timeline of all its new measures. - Based on the information reported by the Member State on cost and resource allocations, timelines of implementation of measures as well as responsible bodies for implementation, the programme of measures is likely to be implemented. It should still be noted that all new measures will be implemented after 2016.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures partially addresses GES and targets for birds (D1, 4), fish and cephalopods (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6). - Slovenia considers that GES will not be achieved by 2020 for commercial fish and shellfish (D3) and contaminants (D8) (see exceptions below). - Slovenia does not report the spatial scope of its measures in its programme. - The programme does not include a quantification of what the measures will achieve; i.e. to what extent the relevant pressure will be addressed, and whether the measures will be sufficient to achieve GES. - Pressures on marine species and habitats are often addressed mainly through spatial protection measures (including MPAs), which limits the spatial scope of the measures and hence the potential benefits for species groups and habitats which are distributed throughout the marine waters. - The spatial measures reported in the programme do not always provide clear and specific information of the management efforts that were/are expected to be put in place, although this information could be found in the corresponding existing legislation. Information gaps include the representation of species and habitats within the MPAs, the size, number and location of MPAs, the conservation objectives of the MPAs, their coherence and the policies and measures that will be in place within these areas.

Strengths and weaknesses	
	- All new measures will be implemented after 2016 (from 2017 to 2020).
D2 — Non-indigenous species	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the introduction of non-indigenous species from shipping (ballast water) (measures linked to the implementation of the BWMC) and aquaculture. - The programme also addresses the introduction of non-indigenous species from fisheries (not reported by Slovenia in Article 8). - The programme includes early detection systems of non-indigenous species introductions as measures.
Weaknesses	<ul style="list-style-type: none"> - It is not clear whether or not the programme of measures addresses biofouling. - Slovenia does not report when it expects GES to be achieved.
D3 — Commercial fish and shellfish	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the extraction of species from commercial and recreational fishing. - The programme proposes temporal fishing bans (to protect and restore marine biodiversity), most of them being linked to the CFP. - Slovenia's programme is likely to cover stocks managed at the national level as well as aspects that relate to age/size of species (this is not mentioned in the programme, but the control of fishing effort and minimum landing sizes included in the CFP should affect this parameter).
Weaknesses	None identified.
D5 — Eutrophication	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses nutrient inputs from sources such as agriculture, industry and urban waste water discharge. - The measures for eutrophication draw from Slovenia's WFD RBMPs. In the framework of the MSFD, most are considered likely to be sufficient to address pressures of nutrient and organic matter enrichment in the marine environment and cover relevant human activities. However, considering the extent to which the MSFD programme of measures relies on WFD measures, this statement is subject to the RBMPs being assessed as adequate under the WFD assessment.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address nutrient inputs from sources such as aquaculture (only local impacts) and tourism/recreation. - It is not clear whether or not the programme addresses atmospheric deposition of nutrients (NO_x) from sea-based and land-based sources.
D7 — Hydrographical changes	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses hydrographical changes from land claim and coastal defence, and port operations. - The programme includes existing measures stemming from other legal acts. As such, all projects that are subject to existing authorisations and regulatory procedures might be addressed in terms of hydrographical changes. - The programme of measures utilises synergies with the EIA Directive, as well as with the WFD, MSP and integrated coastal zone management. - The programme is likely to address the issue of cumulative impacts, i.e. impacts from different/multiple human activities on hydrography. Cumulative impacts are a major issue for the MSFD; assessing cumulative impacts would require

Strengths and weaknesses	
	Member States to consolidate results of individual assessments together to assess the overall scale of hydrographical changes.
Weaknesses	- It is not clear whether or not the programme of measures utilises synergies with the SEA Directive.
D8/D9 — Contaminants and Contaminants in seafood	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses contaminant inputs to the sea from land-based (e.g. industry, agriculture and urban areas), as well as sea-based sources (e.g. tourism/recreation and shipping). - The programme contains measures addressing accidental pollution from industry, tourism/recreational activities and shipping. - The programme includes dedicated measures for contaminants in seafood (D9), but all of them are monitoring measures. - The programme explains how measures for contaminants (D8) will contribute to addressing pressures for contaminants in seafood (D9) and allow for progress towards D9 GES and targets. - The programme covers the biological effect of contaminants.
Weaknesses	- It is not clear whether or not the programme of measures addresses atmospheric deposition of contaminants.
D10 — Marine litter	
Strengths	<ul style="list-style-type: none"> - Slovenia's programme addresses marine litter from land-based (e.g. urban areas) and sea-based (e.g. aquaculture, fisheries) sources of litter. - The programme addresses marine litter from additional activities such as tourism, shipping and port operations (not reported under Article 8). - The programme of measures addresses the reduction of marine litter input in coastal areas and in the open sea, as well as the removal of existing litter. - The programme addresses micro-litter entering the environment from waste water treatment plants, sewage systems and rivers.
Weaknesses	- Slovenia does not report when it expects GES to be achieved.
D11 — Underwater noise and energy	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses underwater noise from port operations (local impacts only), tourism and recreation and shipping through activities-specific measures. - The programme addresses underwater noise from land claim, coastal defence (local impacts only) through a more general measure.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address other energy inputs (such as heat or light). - The programme does not include research efforts which aim to collect additional data to better characterise the pressure of noise, and impact on fauna (mainly marine mammals) in line with recommendation from TG Noise (creation of acoustic data files). This would address knowledge gaps for underwater noise.
D1, 4 — Birds	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses the health of bird populations via general spatial protection measures and measures targeting fisheries activities (including recreational fishing). - Slovenia specified links in between pressures such as non-indigenous species,

Strengths and weaknesses	
	<p>predation on birds' nesting sites, light and noise pollution or marine litter and measures addressing these pressures under other descriptors (e.g. D2 — non-indigenous species, D10 — marine litter and D11 — underwater noise). This allows for an understanding of how the state descriptors will benefit from these measures.</p> <ul style="list-style-type: none"> - Even though the programme does not specify the bird species and habitats that are addressed, Slovenia explained that the species mentioned in the targets are covered by legislation.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not include measures specifically focused on birds. - The programme does not directly address incidental by-catch (decreasing general fishing pressure will, only as a side effect, potentially reduce bird by-catch).
D1, 4 — Fish and cephalopods	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes general spatial protection measures. - The programme addresses pressures such as extraction of species by commercial and recreational fishing. - Slovenia specified links in between pressures such as non-indigenous species introduction, contaminants and marine litter and measures addressing these pressures under other descriptors (e.g. D2 — non-indigenous species, D8 — contaminants and D10 — marine litter). This allows for an understanding of how the state descriptors will benefit from these measures. - Even though the programme does not specify the fish species and habitats that are addressed, Slovenia explained that the species mentioned in the targets are covered by legislation.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not directly address incidental by-catch (decreasing fishing effort and monitoring of by-catch landings from commercial fisheries will, only as a side effect, potentially reduce fish by-catch). - The programme does not specify the fish species and habitats that are addressed (but an effectiveness analysis of the implementation of the measures will assess the need to upgrade the programme or define new measures for biodiversity (D1, 4, 6) and more specifically on large fish). - It is unclear if the programme includes specific plans for cephalopods.
D1, 4 — Mammals and reptiles	
Strengths	<ul style="list-style-type: none"> - The programme of measures includes general spatial protection measures as well as specific measures for mammals and reptiles. - The programme addresses pressures such as mortality from collisions with vessels and underwater noise (especially continuous noise). - Slovenia specified links in between pressures such as non-indigenous species, contaminants or marine litter and measures addressing these pressures under other descriptors (e.g. D2 — non-indigenous species, D8 — contaminants and D10 — marine litter). This allows for an understanding of how the state descriptors will benefit from these measures.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not directly address by-catch (decreasing general fishing pressure will, only as a side effect, potentially reduce bird by-catch).

Strengths and weaknesses	
D1, 4 — Water column habitats	
Strengths	<ul style="list-style-type: none"> - Even though no measures were reported specifically addressing water column habitats under biodiversity (D1, 4, 6), Slovenia specified links in between these habitats and measures reported under eutrophication (D5). Also, horizontal measures and some of the measures reported for the general biodiversity groups will reduce nutrient enrichment and pollution in water column habitats.
Weaknesses	<ul style="list-style-type: none"> - The programme of measures does not address any other pressures such as non-indigenous species and marine litter. It is possible that these are addressed by the measures for non-indigenous species (D2) and marine litter (D10) but based on the information reported this cannot be determined. This does not allow for an understanding of how the state descriptors will benefit from these measures. - It is not clear whether or not the programme directly addresses phytoplankton and zooplankton communities (although a horizontal measure aims to reduce the occurrence of blooms). The water column, although considered in other descriptors, is mainly covered in terms of water quality. Plankton is a key feature of the terminology in the monitoring programmes, which is rarely referenced in the biodiversity measures. Additionally, the water column is a key transfer route for most non-seabed species and needs to be considered as part of the broader ecological coherence of waters, within MPAs and in relation to food webs.
D1, 4, 6 — Seabed habitats	
Strengths	<ul style="list-style-type: none"> - The programme of measures addresses physical loss and damage of the seafloor from land claim, coastal defence, port operations through horizontal measures as well as tourism/recreational activities through biodiversity, activities-specific measures. - The programme also addresses physical damage of the seafloor from fisheries (including recreational fishing, within and outside spatially protected areas, such as via the use of less destructive gears by fishing vessels) and shipping through biodiversity, activities-specific measures.
Weaknesses	<ul style="list-style-type: none"> - The Member State addresses some anthropogenic impacts on seabed habitats through spatial protection measures, which are often lacking detail on their area coverage and temporal ranges of restrictions. - The majority of pressures discussed relates to physical loss and damage to seabed habitat, with minimal consideration of other pressures such as non-indigenous species, eutrophication and marine litter (although the land-based sources of waste discharges (agriculture, industry and urban activities) are also relevant sources of contaminant and nutrient enrichment -related pressures that have an impact on seabed habitats). It is possible that these are addressed by the measures for non-indigenous species (D2), eutrophication (D5) and marine litter (D10) but based on the information reported this cannot be determined.
Exceptions	
<p>Slovenia applies an exception for commercial fish and shellfish (D3). It applies Article 14(1)(a) ('action or inaction for which the Member State is not responsible'). The justification provided relates to the small weight of Slovenia's fisheries in the region, and it specifies actions that have already been taken on the issue (significantly reducing the capacity of their fleets). Additional details highlight that only 1 % of the total catch of small pelagic species in the sub-</p>	

Strengths and weaknesses

region is caught by Slovenia's fishing fleet and its annual landings decreased by 97 % between 1983 and 2014.

This assessment finds the justification of the exception grounded. The small Slovenian fishing fleet (compared to neighbours) cannot be held solely responsible for the state of commercial stocks in the sub-region.

Slovenia applies an exception for contaminants (D8). It applies Article 14(1)(e) ('natural conditions which do not allow timely improvement in the status of the marine waters concerned'). The poor status of the marine waters due to excess concentrations of Tributyltin (TBTs) and the rising trend of mercury in sediment due to industrial activities and maritime traffic, can be explained by historical contamination and natural conditions. Slovenia recognises this as a chronic problem, which it has limited capabilities to remedy, and it will continue to monitor levels and trends, as well as effects, in the case of TBTs. Slovenia's programme of measures includes a measure on this issue but does not provide information on when GES is expected to be achieved. It also notes that the issue should also be tackled at the (sub)regional level.

This assessment finds the justification of the exception grounded. Some substances in sediments have long decay periods and it is unlikely that they will decompose quickly enough to reach GES by 2020, in view of the natural conditions.

Recommendations for Slovenia to consider in its programme of measures:

Recommendations

General

- In general, Slovenia should better address certain pressures and activities. These are specified in the descriptor specific recommendations below.
- The Member State should consider whether it is feasible to reduce the current levels of certain pressures in the marine environment, given that the majority of direct measures focuses on preventing ongoing and future inputs of pressures. It is observed that most measures aim to address ongoing and new inputs of pressures, whilst very few seek to remove or reduce what is already present in the marine environment due to past activities (e.g. non-indigenous species, contaminants).
- GES and targets definitions should be better addressed for birds (D1, 4), fish and cephalopods (D1, 4), water column habitats (D1, 4) and seabed habitats (D1, 4, 6).
- If GES is not expected to be achieved by 2020 (e.g. for D3 — commercial fish and shellfish and D8 — contaminants), then the Member State should estimate the alternative dates by when GES will be achieved
- Slovenia should define the spatial scope of measures in more detail. Furthermore, the spatial scope of the measures should be expanded to cover marine waters beyond coastal waters, where relevant pressures are present. The Member State should consider establishing additional measures beyond spatial protection efforts to address species and habitats. It is important that pressures are addressed across its broader territory.
- The Member State should quantify pressures and their expected reduction as a result of the established measures. This could be facilitated by further efforts to address knowledge gaps and define the methodology for such estimations at regional or EU level. Such quantification will also contribute to linking the measures with the achievement of GES.

Recommendations
<ul style="list-style-type: none"> - Slovenia should improve its programme of measures to address pressures on marine species and habitats. Measures should extend beyond MPAs and other spatially protected areas, to ensure a wider geographical coverage of pressures. - The Member State should provide more information about its measures and its spatial protection measures (representation of species and habitats within the MPAs, the size, number and location of MPAs and the conservation objectives of the MPAs) and establish additional ones that have direct effects on the pressures. - The Member State should ensure better linkages between its programme of measures and monitoring programmes, in order to ensure that the effects of the measures, and hence their efficiency and effectiveness in meeting targets and GES, are measured through the Monitoring Programmes. - The Member State should report data collection efforts under the MSFD monitoring programmes (Article 11) and not under the programme of measures (Article 13). However, when knowledge is too scarce to design effective measures, it is useful to indicate actions taken to address these gaps via research measures.
D2 — Non-indigenous species
<ul style="list-style-type: none"> - Slovenia should address the introduction of non-indigenous species in its marine waters from shipping better, by including measures targeting bio-fouling and not just ballast water management. - The Member State should strive to determine the timelines for achieving GES for non-indigenous species (D2).
D5 — Eutrophication
<ul style="list-style-type: none"> - The Member State should establish measures to address nutrient inputs from aquaculture (even though it only has local impacts) and tourism/recreation. - The Member State should clearly address atmospheric deposition of nutrients (NOx) from sea-based and land-based sources.
D7 — Hydrographical changes
<ul style="list-style-type: none"> - The Member State should apply SEA procedures, in addition to EIA procedures, more consistently to ensure that hydrographical changes are tackled at a strategic level, rather than at the project level. - The Member State should better address pressures from activities not subject to local/project scale EIAs (e.g. fishing, maritime transport). In some cases (e.g. hydrological changes where local dimension is important) this gap hampers the assessment of cumulative effects.
D8/D9 — Contaminants and Contaminants in seafood
<ul style="list-style-type: none"> - Slovenia should clearly address atmospheric deposition of contaminants in its programme of measures.
D10 — Marine litter
<ul style="list-style-type: none"> - The Member State should strive to determine the timelines for achieving GES for marine litter (D10). - The Member State should develop efforts to prevent, identify and tackle pollution hot spots (e.g. from plastic pellets, lost fishing gear, single-use plastics, etc.).
D11 — Underwater noise and energy
<ul style="list-style-type: none"> - The Member State should consider establishing measures that target other energy inputs if possible (e.g., heat, light). - The Member State should establish a register for impulsive low-mid frequency noise; and

Recommendations
ensure that data gaps are addressed for continuous low frequency sounds in line with TG Noise recommendations.
D1, 4 — Birds
<ul style="list-style-type: none"> - The Member State should establish additional measures targeting specific bird species. - The Member State should establish additional measures to directly address pressures on birds, such as by-catch.
D1, 4 — Fish and cephalopods
<ul style="list-style-type: none"> - The Member State should establish additional measures (including MPAs in open sea areas to protect non-commercial fish species) to directly address pressures on fish such as by-catch. - The programme should specify the fish species and habitats covered by the measures. - The Member State should provide better information on existing MPAs and the level of protection they provide for fish (commercial and non-commercial), in relation to where fish species occur within Member States' territorial waters, and how they are protected. - The Member State should clearly indicate whether it developed measures for cephalopods.
D1, 4 — Mammals and reptiles
<ul style="list-style-type: none"> - The Member State should establish additional measures, including spatial protection measures, to directly address relevant pressures on mammals such as by-catch.
D1, 4 — Water column habitats
<ul style="list-style-type: none"> - The Member State should establish dedicated measures to tackle some pressures associated with water column habitats, such as non-indigenous species and marine litter. If these are to be addressed via measures reported for other descriptors, the expected effect that measures are to have on water column habitats should be explained. - The Member State should clearly cover plankton populations in its measures.
D1, 4, 6 — Seabed habitats
<ul style="list-style-type: none"> - Slovenia should provide more details on measures related to protected areas (and MPAs) such as their area of coverage or temporal ranges of restrictions. The Member State should provide timescales and estimates of how spatial restrictions of seabed damaging activities will allow for GES to be achieved. - If seabed habitats are to be addressed via measures reported for other descriptors (e.g. D2 — non-indigenous species, D5 — eutrophication, D10 — marine litter), the expected effect that measures are to have on seabed habitats should be explained.